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INTRODUCTION TO AGRICULTURAL ECONOMICS

SOCIAL SCIENCE TEXT-BOOKS

EDITED BY RICHARD T. ELY, PH.D., LL.D.

Director of the Institute for Research in Land Economics and Public Utilities and Research Professor of Economics, in Northwestern University

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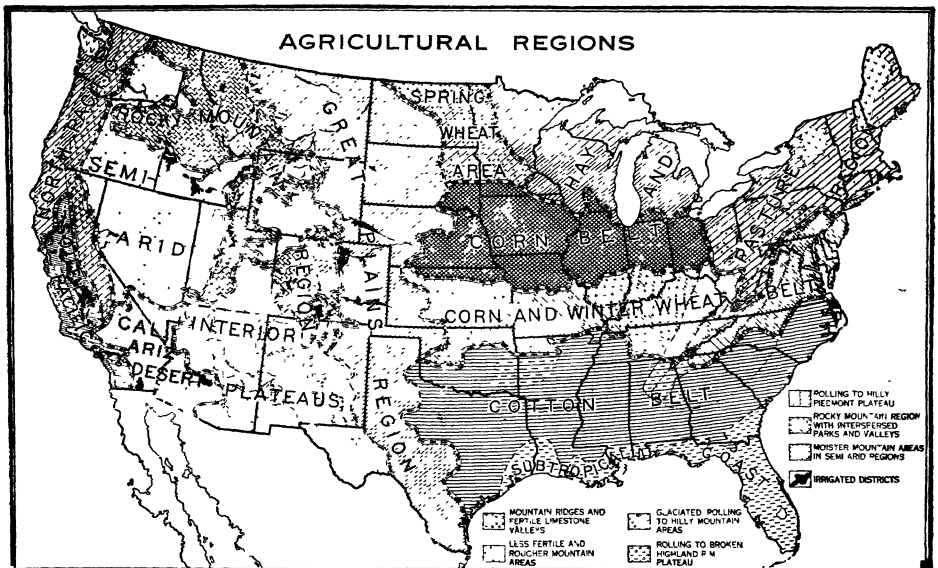
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FIG. 1. — AGRICULTURAL REGIONS

The United States may be divided into twelve agricultural regions. In the East these regions, with one exception, are named after the crops; in the West, because of the dominating influence of topography and the Pacific Ocean upon the climate and the agriculture, topographic and geographic names are used.

INTRODUCTION TO AGRICULTURAL ECONOMICS

BY

LEWIS CECIL GRAY, PH.D.

ECONOMIST IN CHARGE OF LAND ECONOMICS
UNITED STATES DEPARTMENT
OF AGRICULTURE

New York
THE MACMILLAN COMPANY
1927

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Set up and electrotyped Published February, 1924 Reprinted December, 1924; September, 1927.

Norwood Press
J. S. Cushing Co. — Berwick & Smith Co.
Norwood, Mass., U.S.A.

TO

MY WIFE

IN GRATEFUL ACKNOWLEDGMENT
OF HER SYMPATHY
ENCOURAGEMENT, AND
SELF-SACRIFICE

PREFACE

THE present volume was undertaken in the hope of accomplishing two distinct but closely related aims — to provide a textbook in agricultural economics suitable for the use of beginning students and one also adapted to the needs of the large class of general readers whose interest in the economic problems of agriculture is being awakened.

The fulfillment of these two aims seemed to require on the one hand simplicity of treatment and of style, together with the mechanical features requisite for a text adapted to use in the schools, and on the other hand comprehensiveness of scope. With the latter idea in mind the book has been made to cover the important phases of agricultural economics with reasonable completeness. Chapters are devoted to the subjects commonly included in the field of farm management as well as to those considered to belong to agricultural economics in the narrow sense.

In some respects the order of treatment may be considered a little unusual, and a few remarks may be offered in justification. Following the introductory chapter, attention is first directed to the idea of systems of farming as determined by physical, economic, and social conditions In this connection the opportunity is afforded the teacher to devote some time to the study of agricultural geography. The next ten chapters are devoted to those aspects of the subject usually classified under farm management. Because the point of view is largely that of

the individual farm it seems desirable that these chapters precede the more generalized topics connected with the consideration of the collective economic phenomena of agricultural production and marketing. It is said that value and price are the central themes of economics. Nevertheless the chapters on value and price are near the end of the book. This is due to the writer's belief that value and price cannot be adequately discussed without a previous knowledge of the mechanism of purchase and sale and of the various facilities for price determination (discovery). Consequently the discussion of value and price is made to follow the chapters on marketing.

One would be rash indeed to write a book in so new a field without drawing heavily on the pioneer work of others. For the most part no attempt has been made in the present book to give specific credit for these obligations. In fact, the obligation in many cases is not easily traceable to a particular source. It is proper, therefore, that the present opportunity be employed to acknowledge the present writer's indebtedness to the writings or oral suggestions of H. C. Taylor, G. F. Warren, R. T. Ely, W. J. Spillman, B. H. Hibbard, T. N. Carver, and E. Jouzier, as well as to many other writers on the subject of agricultural economics and to numerous writers in the field of general economics. A close intellectual association of nearly fifteen years with Doctor H. C. Taylor and Professor R. T. Ely has made their influence especially potent.

I am obliged to the following for generous aid in reading various parts of the manuscript and making valuable suggestions: Professor John D. Black, of the University of Minnesota; G. W. Forster, C. R. Chambers, Charles L. Stewart, Bertha Henderson, O. E. Baker, John S. Cotton, H. R. Tolley, L. A. Reynoldson, H. W. Hawthorne, S. W. Mendum, O. A. Juve, R. R. Spafford, and L. A. Moorhouse, all of the Office of Farm Management, United States Department of Agriculture. I have drawn heavily on the publications of the Department

for graphs and illustrations, especially the invaluable collection of graphs in the "Graphic Summary of American Agriculture, 1921," by O. E. Baker. I am also indebted for permission to use illustrations to the following: Professor H. C. M. Case, of the University of Illinois; Professor W. I. Myers, of Cornell University; and Professor B. H. Hibbard, of the University of Wisconsin.

Much of the material presented herein was accumulated in the preparation of various courses on Agricultural Economics given by the writer some years ago when he was Professor of Rural Economics in George Peabody College for Teachers. Special acknowledgment is due to the assistance and encouragement rendered by the president, faculty, and students of this institution.

L. C. GRAY

WASHINGTON, D. C.
March 15, 1922

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INTRODUCTION TO AGRICULTURAL ECONOMICS

INTRODUCTION TO AGRICULTURAL ECONOMICS

CHAPTER I

THE NATURE AND SCOPE OF AGRICULTURAL ECONOMICS

I. Relation of agricultural economics to general economics
II. Scope of agricultural economics

I. Relation of agricultural economics to general economics. — Agricultural economics is a branch of the general subject of economics, or political economy. *It may be defined as the science in which the principles and methods of economics are applied to the special conditions of agricultural industry.* In this sense agricultural economics is only one of many branches of applied economics, such as, for instance, the economics of transportation, the economics of money and banking, etc.

A part of the meaning of " economics " is contained in the word " economize." Most of us know what it is to economize, and we often think of it only in the sense of spending less than our income or less than we have been accustomed to spending. A little thought, however, will show that the meaning of " economy " is much broader than merely doing without or saving. Indeed, doing without is often not real economy. The farmer who keeps his boy out of school unnecessarily in order to help with the farm work is not really economical but extravagant. The ultimate cost is much greater than the temporary saving. To be really economical is to attain the greatest possible result in proportion to cost.

The necessity for economy grows out of the fact that most of the things men desire are scarce or can be enjoyed only by means of other things that are scarce. In large measure this scarcity is due to the fact that nature provides us very few things in a form that will satisfy our wants without human labor. Even if we were content to live as did the Indians before the coming of the white men, some labor would be required to make bows and arrows, hunt, build wigwams, prepare food, and make clothing.

As a matter of fact, most of us have almost an unlimited number of wants, and as fast as we satisfy some of them others make their appearance — as the saying is, "one thing leads to another." Even with all the marvelous progress that has been made in industrial methods and organization the wants of men could not be fully satisfied if all men worked twenty-four hours a day and if all the product of their labor was equally divided. Hence, the importance of economy — that is, so using our labor and the materials which nature provides that they will accomplish the greatest possible results.

A single individual or family working alone can accomplish little toward the satisfaction of wants. Robinson Crusoe made his living largely by means of tools and materials obtained from the wrecked ship and largely produced by other men. Even the Indians coöperated in hunting and fishing.

In modern civilized life this coöperation is practiced far more extensively. Its essence is specialization and exchange. Each worker spends his full time in providing one kind of product or service or perhaps one small part of a product or service. The results of his work he exchanges for the other things which he desires. By this process the farmer's labor finally takes the form of coffee from Java, farm machinery from Chicago, clothing from Rochester, shoes from Boston, and physicians' services from the near-by town. The farmer is dependent on the activities of thousands of other individuals, and they in turn are

dependent on him. Numerous and complicated relationships arise — the selling of products, the renting or buying of land, the borrowing of money, the hiring of labor, the use of transportation facilities, the buying of materials and of goods for personal use. In large part these relationships are economic in that they involve considerations of value, price, cost, and profit.

Because it is concerned with these human relationships arising from the association of men in economic activity, agricultural economics, like its parent, economics, may be considered one of the social sciences — that is, one of the sciences dealing with the relationships of men to each other. Among the close relatives of economics may be mentioned history, political science, and sociology.

II. Scope of agricultural economics. — As "charity begins at home," so agricultural economics may be said to begin with the individual farm. The success and prosperity of the farmer is largely dependent on how efficiently he organizes and manages his farm. In such organization and management he is called upon to make innumerable choices and decisions involving economic considerations.

To be sure, in making his decisions the farmer will consider physical and biological facts and must turn for guidance to the physical and biological sciences. However, the information so obtained must be translated into economic terms to be useful; for instance, agricultural chemistry will inform him that the application of two tons of ground limestone to the acre will increase his crop a certain number of bushels each year for several years, but it will still be necessary to determine whether the value of the additional crop will be more than enough to cover the extra costs. Too frequently the decisions have been based entirely on what is physically best to do without applying the tests of cost and value.

The art of managing a farm successfully as measured by the

test of profitableness is called *farm management.* For a time there was a tendency to regard it as a subject distinct from agricultural economics and to confine the latter to the consideration of the collective economic interests of agriculture — to those considerations that concern the statesman rather than the manager of an individual farm. The present tendency, however, is to consider farm management an important branch of the general field of agricultural economics.

There are excellent reasons for this tendency. The farm manager cannot ignore the facts and conclusions hitherto considered by some to belong to the science of agricultural economics. The forces determining the prices of farm products, the methods and costs of marketing, the value of land, labor, and equipment, land tenure, legislation affecting credit, the agricultural tariff, railway rates, taxation, the conditions determining the share of the agricultural class in national wealth and income — all in the long run affect the welfare and influence the conduct of the individual farmer. On the other hand, the study of the collective economic phenomena of agriculture must be based on the individual farm as a unit. For instance, the supply of wheat is the result of the labor of individual farmers; the demand for farm land is made up of the actions of individual farmers. In short, the difference between farm management and agricultural economics is largely the difference between the individual and the collective points of view. Many parts of the entire subject may be studied from either point of view.

QUESTIONS ON THE TEXT

1. Define agricultural economics.
2. Why do we need to economize, especially in this day of highly productive industry?
3. Show that modern economic life involves (*a*) specialization, (*b*) exchange, (*c*) dependence of one individual on others, (*d*) coöperation.
4. Name a number of the social sciences. Why is agricultural economics considered one of them?

SPECIAL PROBLEMS

1. Make a list of ten important economic problems; of ten important agricultural economic problems.

2. Discuss the advantages and disadvantages of regarding farm management as a branch of agricultural economics (see list of readings).

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CHAPTER II

SYSTEMS OF FARMING

I. Systems of farming
II. Conditions determining systems of farming
1. Influence of legal institutions
2. Influence of ratio of population to land and of marketing facilities
3. Cost of transport and marketing
4. Tariffs, subsidies, and other artificial influences
5. The technique of farming
6. Competition or interdependence of enterprises
7. General level of intelligence of the population
8. Abundance of capital
9. Inertia of an established system
10. The natural environment

I. Systems of farming. — When discussing economic problems of farming, many people have in mind some particular kind or system of farming with which they are well acquainted, and consequently their conclusions are based on the narrow range of conditions with which they are familiar.

Table I summarizes a series of classifications of different systems of farming from a variety of standpoints. The summary is by no means complete but is intended to be suggestive and to indicate the numerous variations in systems of farming that may be considered. It will be noted that some of the classes are of historical, rather than present, significance.

TABLE 1. A CLASSIFICATION OF SYSTEMS OF FARMING

I. **Standpoint of basic characteristics of natural resources**
   1. Topography
      a. Hill or mountain
      b. Valley (commonly rolling)
      c. Prairie or plains (usually fairly level)
      d. Alluvial
   2. Control of water supply
      a. Irrigation farming
      b. Dry farming
      c. Humid farming
   3. Temperature zones — *e.g.*, tropical, semitropical, temperate, etc.
   4. Soil characteristics — *e.g.*, sandy, calcareous, alluvial, etc.

II. **Standpoint of kinds of enterprises**
   1. Herding
   2. Predominance of a single crop — *e.g.*, cotton farming, wheat farming, trucking, etc.
   3. Predominance of a single class of livestock — *e.g.*, sheep farming, poultry farming, etc.
   4. Mixed farming

III. **Standpoint of variety of enterprises**
   1. Specialized
   2. Semispecialized
   3. Diversified
   4. Semidiversified

IV. **Standpoint of kind of field system**
   For instance, the "Pennsylvania rotation" (corn, wheat, oats, clover, or timothy, each one year)

V. **Standpoint of size or scale of operation**
   1. Large-scale ("bonanza," estate, or plantation farming)
   2. Middle or medium scale ("family" farms)
   3. Small-scale

VI. **Standpoint of proportion of labor and capital to land**
   1. Kinds of enterprises
      a. Intensive
      b. Extensive
   2. Methods of operation
      a. Intensive
      b. Extensive

VII. **Standpoint of power used**
   1. Tractor farming
   2. Ox farming
   3. Hand-power farming
   4. Other methods

VIII. **Standpoint of effect on soil resources of the system of farming**
  1. Exploitative ("robber farming")
  2. Conservative

IX. **Standpoint of character of business organization**
  1. Private enterprise
    a. Individual
    b. Partnership
    c. Corporation
    d. Coöperative
    e. Communal (soviet)
  2. Public enterprise
    a. Institutional farms (demonstration farms, experimental farms, poor-house farms, etc.)
    b. State farms (government operation)

X. **Standpoint of tenure of operator**
  1. Owner in fee simple
  2. Owner represented by manager
  3. Owners renting additional land
  4. Tenants (cash, share, etc.)

XI. **Standpoint of kind of labor**
  1. Family labor
  2. Wage labor
  3. Cropper labor
  4. Coolie, indented servant, or peon labor
  5. Serf or villein labor
  6. Slave labor

XII. **Standpoint of motives for farming**
  1. Production for pleasure, display, demonstration, and other non-economic motives
  2. Production for family consumption
  3. Production incidental to another industry
  4. Production for sale (commercial)
    a. To make a living
    b. For investment (capitalistic)

II. Conditions determining systems of farming. — If the student will study the system of farming that prevails in some farming region with which he is acquainted and will attempt to arrange the various characteristics of the system of farming according to the classes mentioned in Table 1, he will begin to inquire why these particular characteristics prevail in that region. He will find that the answer to his inquiry generally falls under one or more of the following groups of con-

ditions that largely tend to explain the special characteristics of any farming system:

1. Influence of legal institutions, such as systems of land tenure and of labor
2. Influence of ratio of population to land and of marketing facilities
3. Cost of transport and marketing
4. Tariffs, governmental subsidies, and other public methods of stimulating industries
5. The technique of farming
6. Competition or interdependence of farm enterprises
7. The general level of intelligence of the population
8. Abundance of capital
9. Inertia of an established system
10. The natural environment

1. *Influence of legal institutions.* — Important contrasts between the farming of the medieval period and that of modern times are to be explained in terms of legal institutions and arrangements. Medieval farming was largely characterized by the manorial system and was necessarily different in many respects from modern farming. (See Ch. XV). In many parts of Europe even at the present time agricultural conditions are more or less affected by remnants of the manorial system.

In our own country many of the present characteristics of southern agriculture, especially the plantation system, are largely due to the continuation of the legal institution of slavery for so long a period. In some other parts of the world, especially in tropical countries, a plantation system similar to that of the Southern States has been developed or continued by employing coolie labor — that is, laborers imported from China, India, and other countries under an indenture, or labor contract, according to which the laborer binds himself to work for his employer for a certain number of years. In Mexico the laborers and small farmers are in a condition of semiservitude

known as *peonage* under which they are practically in bondage to the great proprietors of the country.

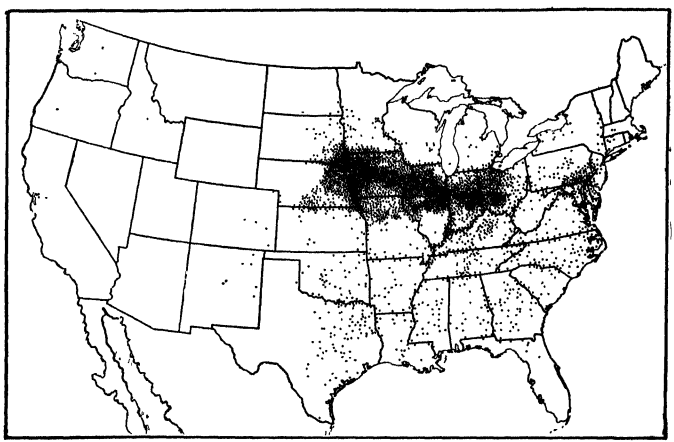
2. *Influence of ratio of population to land and of marketing facilities.* — Development of different systems in the United States has been affected to a marked extent by the influence of the ratio of population to land resources and by the presence or absence of marketing facilities. These two influences are closely related because they tend to develop together.

For many years after the first settlement of America there was little market for any farm products except those not extensively produced in the mother country. Consequently, for a time only the farmers of the southern colonies were able to develop a commercial agriculture — that is, production for sale. The farmers of New England, on the other hand, were compelled largely to maintain a self-sufficing agriculture; farming was carried on only for the purpose of producing the food and clothing used by the farmer's family.

The thrifty New Englanders, however, turned their attention to manufacturing, commerce, and fishing with the result that the population of the country rapidly increased, towns and cities developed, and the New England farmer found at last some market for his product at home. Moreover, markets for food products were gradually developed in the West Indies and elsewhere.

As population moved back from the coast toward the interior it was not so easy to ship products to market until the population had developed in sufficient numbers to justify the establishment of transport by wagons or by boats on navigable rivers. The Indian trader was followed by the herdsman, who maintained large herds of cattle in the woods, for cattle could be driven long distances to market, sometimes hundreds of miles. The pioneer farmer followed on the heels of the Indian trader and the herdsman. For a time, in the absence of any established method of marketing his products, such a farmer was

compelled to maintain a self-sufficing system of farming. Frequently this was combined with the keeping of herds of cattle which could be driven to market. Sometimes also, this farmer made occasional trips to the coast, taking with him small quantities of products easily transported to exchange for necessaries.



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FIG. 2.— CORN PRODUCTION, 1919 (Each dot represents 500,000 bushels)

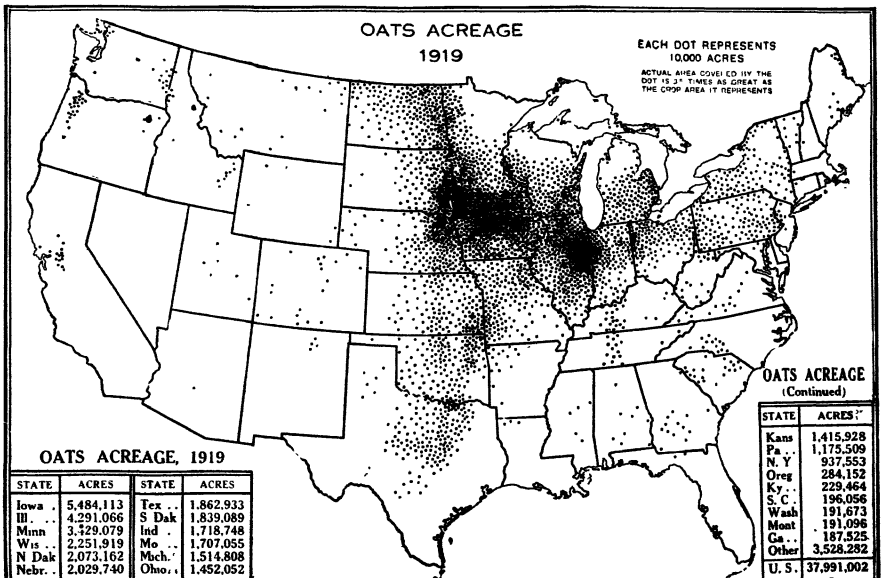
Corn is the great American cereal, constituting about 60 per cent of the tonnage of all cereals grown in the United States and over 50 per cent of the value. More than half of this crop is produced in the Corn Belt; but corn is the leading crop in value also in the Corn and Winter Wheat Belt and is the all-important cereal in the Cotton Belt. The climate and soil of the Corn Belt are peculiarly adapted to it.

Where it was possible to develop regular transportation facilities, this pioneer system of farming gradually gave way to a system of commercial farming. Even after the development of railways there were many isolated sections, especially in mountainous regions, where farming continued largely self-sufficing.

Although the self-sufficing system of agriculture is rapidly passing away, the influence of the system may still be traced in the economic methods of the farmer in many sections of the United States. Since he does not produce for market, the self-sufficing farmer is not compelled to balance money costs against money receipts and to consider whether or not the cost of each particular process of farming is justified by the money returns to be derived from it. Since the food and other necessaries he is able to produce require only a portion of his time, he does not learn to value his labor and to consider the necessity of utilizing his time to the best advantage. Moreover, because he does not sell his products and does not employ money capital in production, the self-sufficing farmer is not likely to be acquainted with the ways of business and the importance of careful accounting and of promptness in meeting financial obligations.

Although the great majority of farmers in the United States produce for sale in the market, the fundamental motive is still that of making a living. Many farmers inherit their farms and acquire their knowledge of farming in boyhood. Consequently they take it for granted that they will employ their property and their labor in the business of farming and do not balance carefully the advantages of farming against the possibility of investing their capital and their time in other lines of business. In short, they do not take the attitude of the investor who with a given amount of capital seeks the most profitable investment for his capital.

In some sections of the country, however, farming has reached this last stage of development. Farmers in this stage consider the capital employed in farming as an investment which is to be so employed only as long as it yields a return comparable with what it might yield if employed in other forms of investment. This stage of development may be known as *capitalistic farming*.



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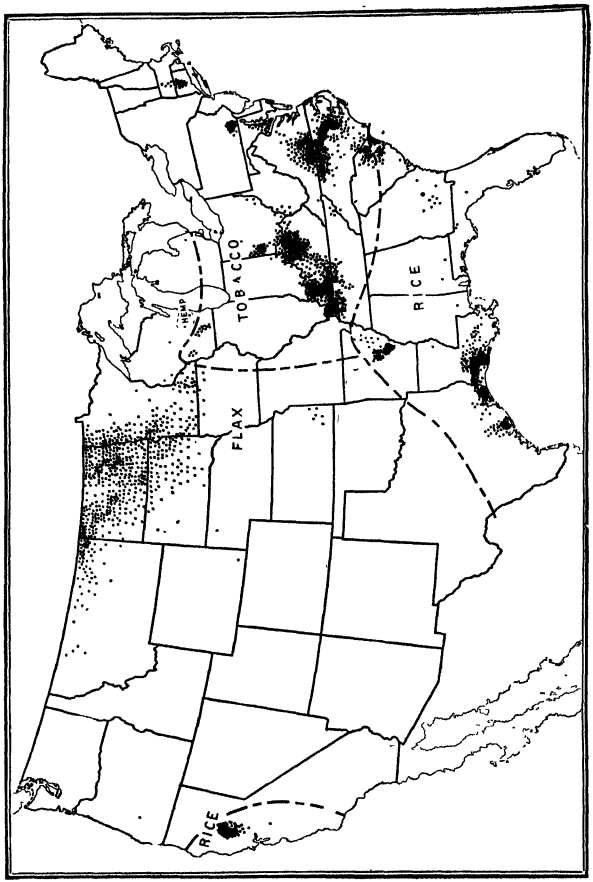
FIG. 3. — OATS ACREAGE, 1919

Oats are best adapted to a cool, moist climate. The large acreage in the Corn Belt is due to the need of feed for horses and of a nurse crop for clover rather than to favorable climatic conditions.

It is desirable from the standpoint of the welfare of the nation, as well as from the point of view of the farmer's welfare, that agriculture shall reach the capitalistic stage, for when this stage is reached the farmer will not employ labor and capital in farming when they earn a smaller return than they might earn if employed in another manner. Thus the resources of the nation will be more effectively employed. The easy-going farm life of the earlier stages of development with its abundant food but scarcity of other conveniences and luxuries will give way to a businesslike system of farming in which every action is measured by the dollar as a yardstick.

When a country is newly settled and contains but a small city population, its agricultural products must be sent long distances to market. Under these conditions it is usually true that some one product proves to be the most readily marketed and the most profitable from one year to another. The result is that for a time, at least, the one-crop system develops. Large portions of the Southern States are characterized by the one-crop system — tobacco, cotton, rice, or sugar — and with the westward movement of agriculture in the North wheat has usually been the basis of a one-crop agriculture. In the North this has usually proved to be only a temporary stage because the rapid increase of population has created a home market, and with the home market has developed a diversified system of farming.

The ratio of population to land is also exceedingly influential not only in determining the marketing opportunity as described above but also in determining the intensity of cultivation. By intensity of cultivation is meant the amount of labor and capital employed for a given quantity of land. *When land is so used that relatively small quantities of labor and capital are employed per acre, the cultivation is said to be extensive. When relatively large quantities of labor and capital are employed per acre, the cultivation is said to be intensive.*



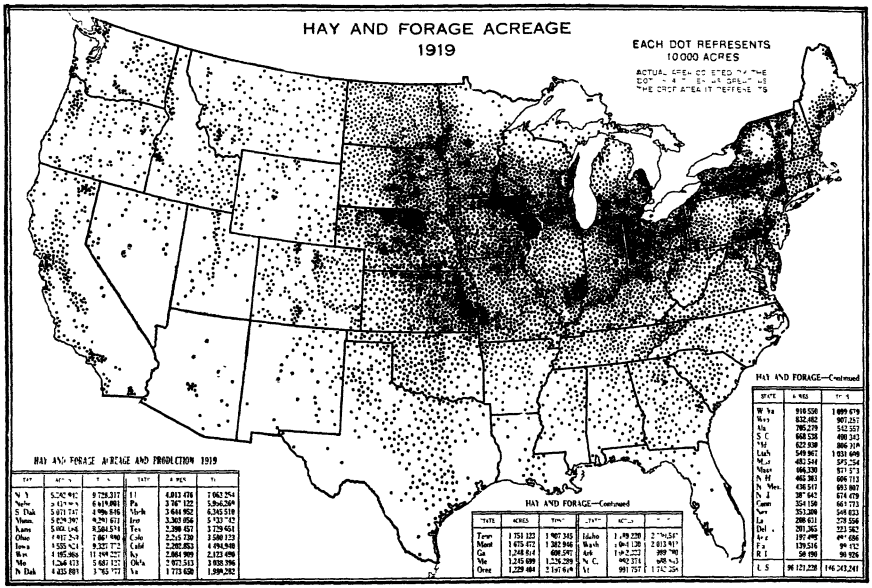
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FIG. 4.—ACREAGE OF TOBACCO, RICE, FLAX, AND HEMP, 1919 (Each dot represents 2000 acres)
Four specialty crops which tend to be narrowly localized.

When land is abundant and labor is scarce, there is little inducement to the farmer to economize in land. There is a tendency to use only the better grades of land for crops and to employ the remainder for grazing, forests, or not at all. Moreover, the land will not be tilled with the same care that would be exercised if the supply of land were very scarce; "robber farming" will be the general practice — little attempt will be made to conserve the soil resources. On the other hand, where land is very scarce and population is dense, as in parts of western Europe, India, and China, every effort is made to economize the land.

There are apparent exceptions to this principle. For instance, there are certain crops, such as truck crops, tobacco, cotton, and sugar beets, that naturally require a relatively large amount of labor to the acre even when land is comparatively abundant and cheap and when general conditions tend to encourage an extensive, rather than an intensive, system of agriculture. On the other hand, an extensive crop requiring comparatively little expense per acre may sometimes be produced in a region of dense population and great scarcity of land. Thus, large quantities of hay are produced in England because the expense of transporting so bulky a crop makes the expense of importing the supply prohibitive, and crops of a more intensive character are imported. Butter and cheese may be produced a long distance from market, for not only are they comparatively unperishable for considerable periods of time but they involve high value in proportion to bulk, and the cost of shipment is but a small percentage of the value. In regions where land is scarce and high in price there will be a tendency to employ more labor and capital per acre in the production of a crop than would be employed for the same crop in a region where the opposite conditions prevail.

3. *Cost of transport and marketing.* — We have already noted the fact that the cost of transport and marketing determine to a



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FIG. 5. — HAY AND FORAGE ACREAGE, 1919

This map of hay and forage includes not only hay crops but also corn and the sorghums cut for silage or fodder and root crops used for forage.

marked extent what crops can be most profitably produced in a given district.

Generally speaking, there is a tendency for the products which involve a large expense of transport in proportion to value or which are highly perishable to be produced near the centers of consumption. The case of hay has already been mentioned. Market milk is a product that must be produced fairly close to the centers of consumption, although the development of fast train service may extend the possible distance several hundred miles. Such products as wool and cotton may be shipped great distances at small expense in proportion to value. The localities of their production are likely to be determined more by considerations of soil, climate, and labor supply than by considerations of marketing and transportation. Even where conditions of soil and climate are favorable near the large centers of consumption, the products that can economically be shipped long distances are likely to be crowded out by the competition for land of those products which require to be produced near markets.

4. *Tariffs, subsidies, and other artificial influences.* — The agriculture of a region may largely be due to the special advantages afforded by protective tariffs, governmental subsidies, and railway rates. Thus the sugar industry in the United States and to some extent the rice industry owe their continued existence to protective tariffs.

5. *The technique of farming.* — In different countries of the world and even in different parts of our own country there are great contrasts in the extent to which modern improved methods and devices are employed by farmers. In many parts of Europe, for instance, farm machinery is used to a much less extent than in the United States largely because labor is comparatively cheaper in Europe. This is even more the case in a country like China where labor is so cheap that it usually does not pay to employ expensive kinds of farm machines. In the

latter case, however, another factor is the ignorance and small amount of technical knowledge and experience among the masses of the people.

Sometimes the system of agriculture is the result of the special skill and experience of the population of a given district. Thus the Swiss cheese industry in Green County, Wisconsin, is due to the special skill of the farmers who emigrated from districts in Europe where the industry was already established.

6. *Competition or interdependence of enterprises.* — What farm enterprises shall be carried on in a given region is sometimes determined by the relation of the enterprise to other enterprises. This relationship may take the form of competition of enterprises for land and labor with the result that certain enterprises otherwise well adapted to physical conditions of the region are displaced by other enterprises still better adapted. (See Ch. IX.) For instance, in the South cotton is produced on areas which are physically capable of producing corn and other crops. The superior profitableness of cotton gives it an advantage in the competition both for land and for labor.

On the other hand, frequently the agriculture of a region is characterized by the production of certain crops which would not be produced there except for the fact that other enterprises are in one way or another dependent upon them. For example, in some parts of the United States the production of live stock is not very profitable, but the manure is needed for the raising of crops.

7. *General level of intelligence of the population.* — The contrasts in different regions in the extent to which improved methods are used are partly due to the differences in the intelligence of the population. In those sections where education has made great progress, where the people read extensively, and where various extension agencies are employed in spreading the knowledge of improved methods of agricultural practice,

systems of farming have made much greater progress than in regions where the ignorance and prejudice of the population have prevented the introduction of progressive methods.

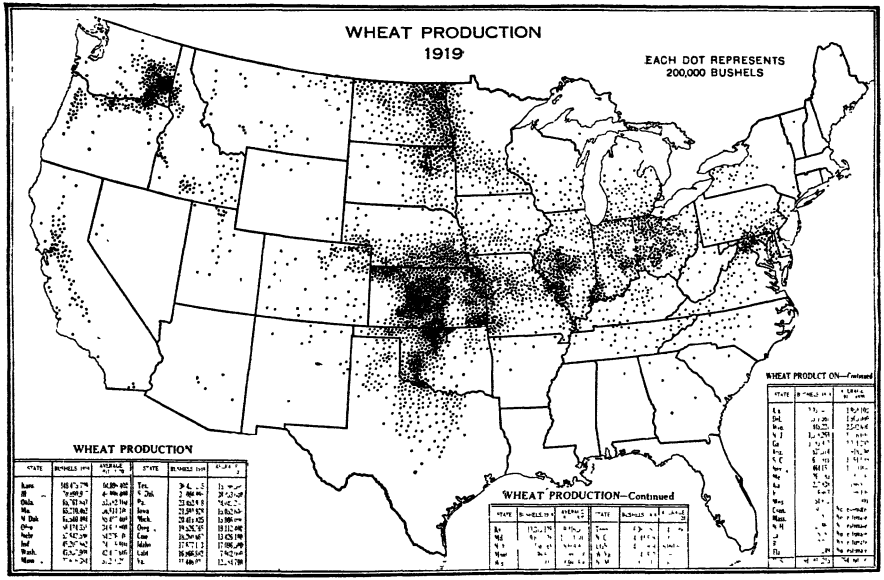
8. *Abundance of capital.* — In some sections of the country agriculture has been retarded in its development by the scarcity of capital. This has been especially true in the Southern States where one of the effects of the Civil War and of the cost of reconstruction was to make capital exceedingly scarce.

9. *Inertia of an established system.* — Whatever conditions have been responsible for the development of a particular system of agriculture in a given region, that system is likely to prevail for a long time because of the slowness to change which is more or less characteristic of many industries but particularly of farming.

From another point of view, the fact that a system is already established in a given region not only accounts for its still being carried on there but also for its not being carried on elsewhere. The fact that an industry is established is in itself an advantage, for the farmers have passed beyond the stage of costly experiments, have acquired the necessary experience, have erected the needful buildings and purchased suitable equipment, and have established connections with the market. When prices are low, it might not be possible to establish the industry in a new region, incurring the heavy initial expenses mentioned above, even though it might be profitable to continue it in the region where it is already established.

The special advantage of an established system of farming may be increased by the development of a reputation for superior products based on a trade-mark or special brand for the product of a region.

10. *The natural environment.* — In the United States at present the natural environment tends to be the most important of the various conditions in developing contrasts between the systems of farming in different regions.



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FIG. 6. — WHEAT PRODUCTION. 1919

The United States produces about one-fifth of the world's wheat. The quantity shown on the above map is smaller than usual for the Dakotas but larger than usual for the Corn Belt and corn and winter wheat regions.

The important influence of the natural environment is shown by a study of the location of any one of the principal crops subject, however, to modification by the other influences that have already been discussed. For instance, let us consider the influence of the natural environment in determining the geographic location of wheat production. Wheat requires a cool, moist, formative period and a dry, warm period for ripening. Hence, throughout the torrid zone as well as on its borders wheat growing is successful only in plateau regions or desert regions under irrigation, as in Egypt or Mexico. India is an exception, for the rains brought by the monsoon in summer occur after ripening. In the Corn Belt the competition of this more productive crop, which has a much more limited climatic range than wheat, tends to push wheat growing into the semiarid plains to the west. Most of the great wheat producing regions of the world possess a subhumid climate. For instance, in the United States the three areas of densest production, Central Kansas, North Dakota, and Eastern Washington, have an average annual precipitation ranging from 15 to 30 inches. Likewise in Russia, Argentina, India, and Australia, other great wheat regions of the world, the climate is subhumid in character. But in Western Europe and in the Eastern United States the yields of wheat per acre are higher than in these subhumid regions. Wheat is grown in subhumid regions largely because other crops do not succeed so well in such climates. However, where the rainfall exceeds 45 inches a year, wheat does not thrive, partly because the soils have undergone more leaching than in subhumid regions but principally because rusts and other fungous diseases are more prevalent. The difficulty of harvesting in rainy weather is also an important factor.[1]

Note to Teachers: It is impossible in a brief text of this kind to describe the farming systems that prevail in the United States. The chapter

[1] Cf. Smith, J. Russell, *Industrial and Commercial Geography.*

should be supplemented by careful study of agricultural maps showing the locations of the various crops. Such maps will be found in "A Graphic Summary of American Agriculture," by O. E. Baker, *Yearbook Separate 878*, United States Department of Agriculture; or "Geography of the World's Agriculture," by V. C. Finch and O. E. Baker, published by the United States Department of Agriculture.

QUESTIONS ON THE TEXT

1. Name the ten important kinds of conditions which tend to determine the system of farming in any region.
2. Give an illustration of how a system of farming was largely determined by legal arrangements peculiar to the section of the country.
3. How does a system of self-sufficing agriculture differ from commercial agriculture?
4. Why did the southern colonies develop commercial agriculture sooner than did New England?
5. Why are self-sufficing farmers careless about saving labor? Why do they not consider cost of production?
6. What is meant by capitalistic farming?
7. Why is increasing density of population likely to result in a change from a one-crop system to a diversified system of farming?
8. What is meant by intensive cultivation? Extensive cultivation?
9. What is the relation of density of population to intensity of cultivation?
10. Explain the influence of conditions and cost of transportation on the location of production of each of the following products — wool, cotton, vegetables, milk.
11. Give illustrations of various farm products whose production in this country may be attributed to the aid afforded by tariffs.
12. Why may a system of agriculture, once established, continue to exist even though it would no longer pay to establish it anew? Explain.

SPECIAL PROBLEMS

1. Each student in the class may be assigned the task of finding out the principal regions of the world where some important farm product is produced. The task should not be confined merely to making a list of countries which produce each product, but the section of the country should also be designated. Various texts and pamphlets on commercial and agricultural geography may be employed.

2. Large areas in the United States are physically adapted to silk production. Why do we not produce our supply in this country?

3. Large areas in the South, now employed for the production of cotton, are adapted to the production of corn. Why is cotton raised instead of corn on these areas?

SUGGESTED READINGS

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CHAPTER III

THE FARM CONSIDERED AS A BUSINESS ENTERPRISE

I. Advantages and disadvantages of farming as an occupation
II. Economic contrasts between farming and other kinds of industries
III. The basis of successful farming
IV. Qualifications of a successful farmer
V. Choice of region and kind of farm
VI. Choice of the farm
    1. Topography and soil
    2. Availability of market
    3. Economical size of farm
    4. Farm arrangement or layout
    5. Buildings and other permanent equipment
    6. Purchase price
    7. Use of score card

I. Advantages and disadvantages of farming as an occupation. — In former times large numbers of people were born to farm life and knew no other opportunity or found it most difficult to detach themselves from the farms. In pioneer days of American agriculture cities were few and the contact of the farmer with city life was infrequent. In recent years, however, young men even when born on the farm are no longer taking farming as a matter of course, for other opportunities are available. Nearly every farm boy now faces the question, "Shall I remain on the farm?" while city men and boys ask themselves whether they shall return to it.

Many broad generalizations have been made concerning the special advantages and disadvantages of life on the farm.

Frequently these generalizations are based on observation of special cases or limited districts. It is possible to find instances of life on the farm which are nearly ideal in character. It is also possible to find squalor and misery such as can scarcely be equalled in city slums. It is sometimes said that farming is characterized by a peculiar independence. This is true so far as employment is concerned. The farm owner is not dependent on the will of another man for a job, though it should be remembered that this independence does not apply to the farm laborer, who is frequently more dependent for employment than the majority of city laborers since his work is often of a casual character. Moreover, many tenants do not possess the measure of independence that is commonly attributed to the farming class. Even landowning farmers are frequently very dependent on other classes in their economic relations.

It has been cited as a special advantage of farming that the home and the business are in the same place so that neither the head of the family nor the other members of the family need leave home to obtain employment. On the other hand, this identity of business and home life frequently makes for monotony and is characterized by isolation.

The farmer has the advantage of a certain degree of security from absolute starvation in periods of extreme emergency, such as a great war, for instance, in the recent war the farmers of the blockaded Central Powers are said to have fared better than the urban populations. On the other hand, the farmer frequently lacks many of the pleasures made available by city life.

The farmer's work is out of doors and he may enjoy close contact with nature, but he is also exposed to the hardships of weather and may frequently be unable to appreciate the poetry of nature.

Farming is proverbially a healthful occupation, yet it is possible for one to be just as healthy in the city when proper sani-

tary precautions are taken. Moreover, there are indications that the general difference in healthfulness between city and country is gradually being reduced by the rapid progress of sanitation in the cities. In a little over a century (from 1800 to 1915) the urban death rate fell from 22.1 per thousand to 15.2 per thousand, while the rural rate fell only from 15.2 to 12.7, so that at the present time the urban death rate does not exceed the rural death rate by a large amount.

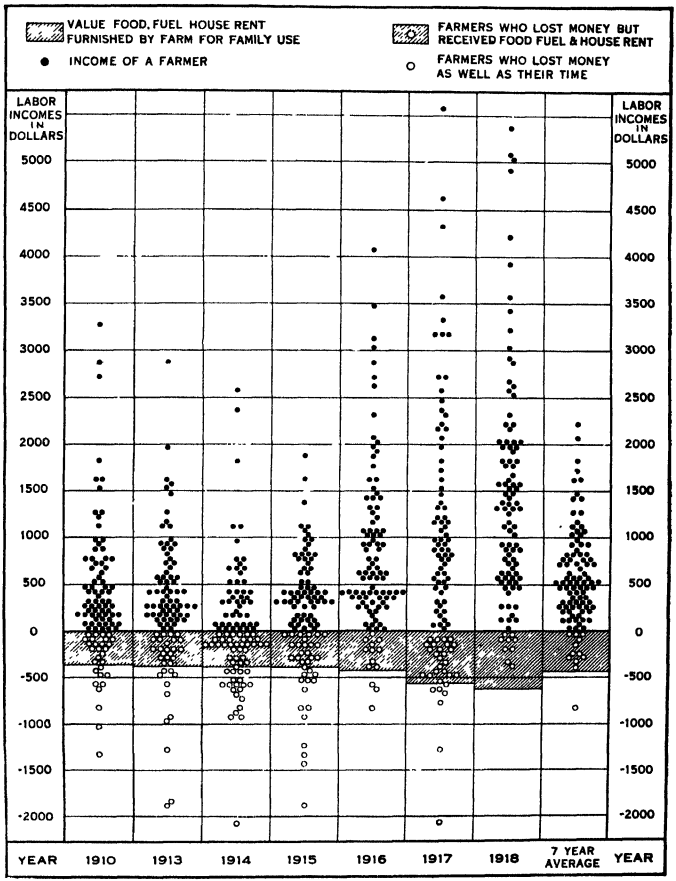
Rural life is also supposed to be freer from stress and strain than city life, and this conclusion seems to be confirmed by the fact that the insanity rate of cities is nearly double that of the country. However, feeble-mindedness is more prevalent in the country than in the city.

Farming does not offer the promise of large financial rewards even to the most successful. Few people succeed in making more than a modest fortune from actual farming, and studies of farm earnings indicate that the average return to the farmer for his labor and risk is very modest.

In short, farming as an occupation is certainly unattractive when the conditions are not favorable but may be highly attractive under favorable conditions. It is no life for a weakling. No man should undertake it who does not enjoy contact with nature, but if he can acquire the point of view and habit of mind necessary to appreciate this contact, he will find therein compensation for many of the other disadvantages of the occupation.

II. Economic contrasts between farming and other kinds of industries. — One of the important reasons why farming as an occupation is not a source of large fortunes is the fact that it does not lend itself to large-scale operations measured by the standards of large businesses of the present day.

If it were feasible for the same individual or company to operate many farms at the same time, there might appear a tendency for large fortunes to be made from farming and toward



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FIG. 7. — LABOR INCOMES OF ONE HUNDRED FARMERS (Forest and Johnson Townships, Clinton Co., Indiana)

A large proportion of farmers have no return for their labor after paying expenses and allowing for interest on capital. Each dot represents the labor income of one farmer. (For definition of labor income see p. 48.)

the concentration of the farming industry under the ownership of large corporations or syndicates. The very nature of the business, however, makes this difficult. Manufacturing and transportation enterprises can be developed on a vast scale because most of the functions can be standardized and reduced to routine. In the case of farming it is difficult to reduce activity to routine. Changes in weather, insect pests, and plant diseases may disturb the best laid plans. For the same reason it is difficult to develop a systematic and extensive division of labor in the farm enterprise.

Growing out of the above circumstances is the fact that farming is a highly competitive industry. Since it is made up of hundreds of thousands of different industrial units each producing the same commodity, there is little chance for monopoly in any form to develop. Moreover, the occupation is open to him who cares to enter it. People with comparatively little capital can engage in it. Consequently if the returns to the farmers as a class increase to a considerable extent, it is easily possible for the number of farmers to multiply rapidly. The increased products are likely to reduce prices to such an extent that the temporarily large returns are no longer to be obtained by ordinary methods of farming.

III. The basis of successful farming. — In the past it has been possible for some farmers to acquire considerable wealth through increase of land values or through fortunate trading. It is probable that in the future success must be achieved largely by good management rather than by fortunate speculation. It will involve careful planning, efficient organization, minute economies, systematic accounting, and employment of scientific methods.

IV. Qualifications of a successful farmer. — If one is to make a success of farming, it is usually necessary that one have adequate experience not only in farm activity but also in farm management. Few occupations require such wide knowledge

of many different things. The farmer must have a knowledge of the properties of soils and their adaptability to plants; different methods of building up soils; the peculiarities of many different kinds of plants; how to plant, cultivate, and harvest each kind; the properties of various kinds of weeds and how to exterminate them; the characteristics of various insect pests and plant diseases and methods of dealing with them; methods of fattening and caring for live stock. The farmer must have a smattering of veterinary science; he must know something of machinery; he must be a carpenter, a painter, a blacksmith, and a cement worker; he must have acquired the skill necessary to handle live stock in the fields and to train them to the uses of the farm; he needs to know something of business matters and accounting and to be familiar with the costs of numerous materials and kinds of equipment; he must be able to estimate the cost and probable financial returns of different farm enterprises and processes; he should have a shrewd ability in buying and selling and in watching for small financial leaks in the business; he must be sufficiently adaptable to get along with laborers and to manage men as well as horses. This extensive experience must normally be supplemented by physical strength, vigor, endurance, and self-reliance.

There is probably no school in the world that can impart this wide variety of qualities unless supplemented by experience in actual farming. The city man who undertakes to manage a farm without first acquiring this experience is usually doomed to failure unless he has sufficient outside income to supply the losses he is likely to incur in the process of learning.

V. Choice of region and kind of farm. — For the man who makes a deliberate attempt to select the region and kind of farming, there are strong reasons for preferring under ordinary conditions the region and kind of farming with which he is already familiar. It is very difficult to adjust oneself to the farming conditions and methods of an entirely new region and

type of farming, and there are great advantages in settling in the district where one has acquaintances and friends.

There is a tendency for city people who attempt farming to settle on the poorer grades of land on account of the attraction of low prices. Not only do they have the disadvantage of having to become acquainted with the business of farming with all its complexities, but also they must struggle against poor soils, stumps, bad drainage, lack of markets, and inadequate community organization. It is hard enough for an experienced farmer to cope with these difficulties. The experiment is likely to be especially disastrous for one who lacks experience in methods of farming.

After one has determined upon a region, it is usually important to adopt the general system of farming which prevails in the region, for this system is likely to be the result of many years of experimentation. Many new farmers go into a new region with the idea of revolutionizing the system of agriculture only to learn to their cost that the native practices, although they may seem crude, represent a successful adaptation to the conditions of the region. After the farmer has selected the type of farming he prefers, it is equally important to settle in the region where this system predominates. Many city people make the mistake of "faddism" in farming — that is, they have read of some new and wonderful way of getting rich by farming and seek to put it into practice in a region where the agriculture is of an entirely different character. The individual is likely to find it very hard to sell his vegetables, fruits, or poultry to advantage in a region where these products are not extensively produced, for there is likely to be no organized market for them.

One is apt to run a great hazard in undertaking to farm successfully in a region where people are generally extremely poor. Occasionally it is possible to account for this prevailing poverty by some special circumstances. For instance, many

sections of the Southern States were extremely impoverished by the Civil War and by the cost of reconstruction, and the lack of capital prevented the rapid development of a prosperous agriculture. In a few sections of the United States the poor system of farming is due to ignorance and inertia of the population. Ordinarily, however, the poverty is associated with poor land and lack of agricultural opportunity. Of course, if one is sure he has some new method of succeeding where others have failed, he may find it desirable to select a region where the people have failed to develop a prosperous system of farming. Many mistakes have been made in attempting to farm in regions of insufficient rainfall. Such regions are characterized by very variable precipitation. Sometimes the rainfall is adequate for several years, and this period will be followed by a number of years of drought. There are some arid sections that have had drought for as many as nine or ten years in succession following a few years of good rainfall. Thousands of farmers have made the mistake of assuming as permanent the temporary prosperity of a few fat years and have lost their all in the undertaking.

VI. Choice of the farm. — Assuming that one has selected a region and system of farming, an important problem is a wise selection of the farm, for this choice involves the selection both of a place of business and of a home. Neither object should be sacrificed for the other. Few farms are wholly ideal in all respects. In selecting a farm some disadvantages must be accepted. The important thing is to determine whether disadvantages are capable of being remedied in time or whether they are permanent and incapable of being altered.

1. *Topography and soil.* — Since the introduction of machinery, topography is more important than it was fifty years ago when hand methods of agriculture prevailed. Thousands of farms were developed in hilly regions through preference in the days when hand implements were largely employed, and many

of these farms have been abandoned or turned into grazing areas since machine farming developed. If one expects to use tractors, it is especially important that the topography shall not be too uneven. An uneven topography is favorable to erosion and frequently necessitates heavy expenses for terracing and a modification of the rotation system to prevent the washing of the land.

The physical condition of the land is a matter of great importance. Sometimes good land has been washed or gullied to a serious extent or may be covered with weeds that cannot be eradicated without heavy cost. The presence of stumps and brush may be a serious drawback. This will depend on the system of agriculture and the difficulty and cost of clearing. Many farmers have made the mistake of undertaking to develop a farm on stump land without counting sufficiently the cost of clearing. Drainage conditions should be given serious consideration. Most good soils may be greatly improved by drainage. If the land is not adequately drained, it is important to consider whether drainage is possible or not. Some soils are so shallow that tile cannot be placed deep enough below the surface. Sometimes a ridge of clay or rock runs across the face of a slope and makes either natural or artificial drainage difficult and costly. Sometimes a field that appears well drained on account of having sufficient slope is really very poorly drained because of the thin soil or on account of the outcrop of clay ridges which impede natural drainage.

Ordinarily, farmers are fairly good judges of the quality of soil within the region with which they are familiar, but they are often deceived when they attempt to apply the same standards of judgment to other regions. Thus many farmers from the Corn Belt have been deceived by the apparently rich black soils of certain portions of northern Missouri and southern Iowa. These soils appear on the surface to be a rich prairie loam similar to the Marshall silt loam of the Corn Belt but in

reality are underlain by a hardpan which is so close to the surface as to prevent the proper drainage of the soil. Similarly, many farmers have selected soils in semiarid regions which have every indication of great richness only to find them nearly worthless because of the presence of alkali.

The subsoil conditions are exceedingly important. In some sections of the South, for instance, the surface land is a fine sand but there is an underlying subsoil that is sufficiently rich to supplement materially the thin soil of the surface. Sometimes it is important to consider whether a subsoil will retain fertilizers or whether it is of such a character that there will be a heavy loss from the leaching of fertilizers. When selecting land in a new region it is well to have the advice of those who are familiar with the types of soil and their possibilities.

So much has been written about the possibility of building up infertile soils by the use of legumes and other green manures that many people exaggerate the profitableness of purchasing poor soils for the purpose of improving them. It is sometimes true that a soil is poor because of the absence of some one element which can be easily and cheaply restored. Generally speaking, however, it is difficult to take a soil which is poor in most of the elements of fertility and build it up to permanent fertility. Such soils can be improved by green manuring, but it is usually necessary to continue this process if the soil fertility is to be maintained. Before selecting poor soils with the idea of improving them, one should make a careful estimate of the probable cost of improving and a comparison of the annual cost with the extra rent that would be required for good land.

Most very light and sandy soils are deficient in elements of fertility and require, after a short time, fertilizers to maintain their fertility. Such light soils have the advantage over heavy clay soils in ease of working. For certain crops which require very intensive cultivation, for example, truck crops, tobacco, and cotton, it may sometimes pay to improve such soils

at heavy expense for fertilizers on account of the economy in cost of cultivation.

Soil conditions are frequently indicated very accurately by the presence or absence of certain kinds of trees, weeds, or domesticated plants. Thus the presence of Kentucky blue grass, alfalfa, or red clover is an indication of a considerable lime content. Among the plants that indicate poor land are pine, spruce, beech, chestnut, goldenrod, sorrel, daisy, and wild carrot. Among plants generally indicating good land are hickory, walnut, ash, basswood, Canada thistle, and quack grass. Sagebrush generally indicates the absence of alkali, and greasewood usually indicates the presence of alkali.

It should be noted, however, that general lists of this kind must be used with caution. In the first place, the presence or absence of no one species of plants can be taken as a sure indication of the quality of the soil. Moreover, the general growth may be largely affected by such factors as location of the water table, drainage conditions, and previous use by man.

2. *Availability of market.* — One of the most important considerations in the choice of a farm is its advantages or disadvantages with respect to marketing the products. In the first place, the distance of the locality from the general region of consumption should be considered. Thus the average annual farm price of wheat per bushel for the ten years 1910–1919 inclusive was $1.42 in New Jersey as compared with $1.34 in Minnesota, a difference of 8 cents a bushel. The average farm price of corn from 1910–1919 was 72 cents in Iowa, $1.13 in North Carolina, $1.20 in California, $1.30 in New York, and $1.10 in New Jersey.

Frequently matters of even greater importance are the location of the farm with respect to the local market. The distance from market and condition of the roads should be considered. The importance of these factors will vary somewhat with the

bulkiness of the product and the frequency with which it must be carried to market.

The local facilities for marketing are of especial importance. In the case of specialities, such as fruit and vegetables, the individual operating on a small scale can rarely market his product successfully if there are no established arrangements, either private or coöperative, for the purpose. (See Chapter XXII.)

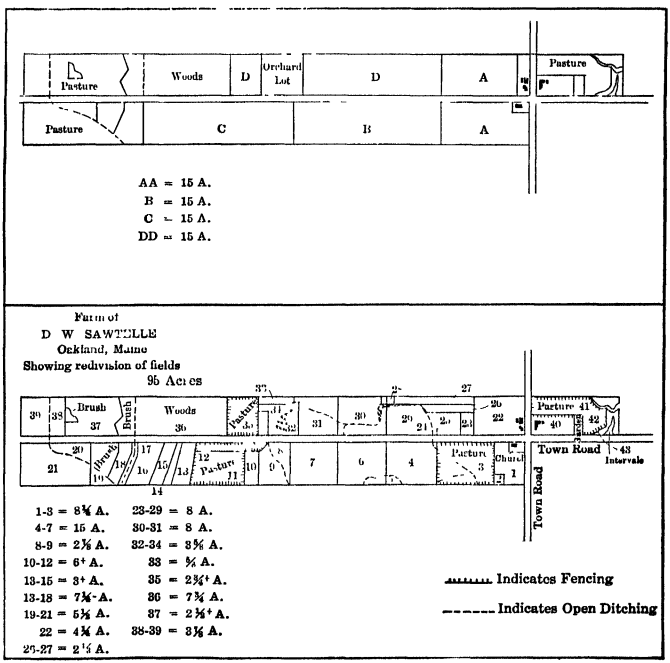
3. *Economical size of farm.* — One of the most important considerations in acquiring a farm is that of size. It has been found that one of the greatest reasons for failure in farming is due to the fact that the farm is not large enough for the most economical application of labor, capital, and managerial activity. (See Chapter VIII.)

If one does not have sufficient capital to purchase a farm of economical size, it is usually better to rent a farm or to rent additional land rather than to undertake to operate on a scale that means inefficiency. Furthermore, if one buys a farm that is not sufficiently large to be economical, it is important to consider the possibilities of adding to this by subsequent purchases. If the farm under consideration is too large for economical operation, it is equally important to consider the possibility of disposing of portions to advantage, either by renting or by selling, without seriously disturbing the economical arrangement of the farm.

4. *Farm arrangement or layout.* — Another important factor in successful management that should be considered in acquiring a farm is the general arrangement or layout — that is, the location of buildings, convenience of roads, relation of buildings and fields to the location of water supply for home use and for stock, and the size and shape of fields.

In old settled sections fields are often too numerous, too small, and too irregular because laid out before the development of modern farm machinery. It may be entirely possible to re-

arrange fields by tearing down a few fences without incurring heavy expenses. In fact, the rearrangement of fields and roads is usually more feasible than the relocation of buildings.



Photographic files, Bureau of Agricultural Economics, U.S. Dept. of Agr.

FIG. 8 — REARRANGEMENT OF THE LAYOUT OF A FARM

The above chart shows how a farm layout comprising numerous small irregular fields was rearranged so as to make a more convenient and economical field arrangement.

One should consider carefully the location and character of buildings from the standpoint of convenience in performing chores, as well as the other work of the farm. It is possible

to save a large amount of labor when buildings are properly located and constructed with a view to convenience.

The water supply is also a most important consideration. It is highly important to determine that the supply is adequate for the needs of men and stock and that it is of good quality. It is important also that the supply shall be so regulated that it will be accessible to stock at the least possible cost of human labor and that it be also conveniently accessible to dairy house and dwelling.

5. *Buildings and other permanent equipment.* — In the case of many farms, especially in old settled regions, too much has been invested in farm buildings. One should remember that, while buildings aid in production and when conveniently planned may be a source of considerable saving of labor, they are nevertheless not primarily a source of income, and unless a farm is sufficiently fertile and contains sufficient acreage, it may not be able to support expensive buildings. This is especially the case with the residence.

In the present high cost of building, a farm fully equipped with buildings may be cheaper than purchasing raw land with a view to adding improvements. Sometimes, also, it is possible to purchase movable equipment, such as farm machinery and stock, with the farm at a good bargain.

6. *Purchase price.* — Other things being equal, the purchase price of the farm is a deciding factor. A farm that is ideal from the standpoint of the considerations mentioned above may be priced so high as to be undesirable if compared with a farm less complete in its appointments but at a lower price. On the other hand, many people make the mistake of buying farm property because it seems cheap. It is very important to consider whether the disadvantages responsible for the low price seriously affect the productivity and earning power and also whether these disadvantages can be remedied. One should be careful about sacrificing productivity for cheapness

because of a seeming large difference in price. The interest per acre on $100 land at 5 per cent is only $2.50 more than on $50 land. It may be that the productive difference is much more than $2.50.

It is also important to determine whether the price of land is too high in relation to the annual net return which it will yield. Frequently land bears a high price because of the expectation that it will increase in value, and one pays this high price not for its present earning power but for the speculative chance that the price will increase in the future. (See p. 252.)

7. *Use of score card.* — It has been suggested that the employment of a score card is a useful way of making comparisons between different farms under consideration. Such a score card compels attention to all points of advantage and disadvantage instead of leaving decision to vague or general impressions.

The following is an illustration of a score card issued by the Office of Farm Management and Farm Economics, United States Department of Agriculture, in a recent bulletin:

FIG. 9. — BLANK FORM FOR USE IN SELECTING A FARM[1]

Location of farm.....
Owner.....
Address.....
Distance to shipping station.....; to trading center.....
Condition of roads.....; in winter.....; in spring.....
Distance to schools and churches.....; to nearest neighbor.....
Is telephone available?..... R. F. D.?.....
Electric current for lighting.....; for power.....

Total area of farm.....; acres in crops.....; acres that can be used for crops....; acres in pasture....; acres in woods....; acres in waste land....; in roads, buildings, lots, swamps, lakes, etc.....; acres in stump or brush land.....; kind of timber.....; ease in getting out timber or wood.....

[1] "Selecting a Farm," by E. H. Thompson, *Farmers' Bulletin 1088*, United States Department of Agriculture.

Topography as regards economy of cultivation ... ; irrigation.....; danger from erosion or sliding .. . . . ; flooding . . . .
Natural fertility as evidenced by kind of forest growth and native vegetation.....
Present condition of fertility as evidenced by growth of crops or weeds . .
Physical condition of the soil . . ; adaptability to legumes .....; adaptability to all kinds of crops . . . .
Natural drainage . ; artificial drainage . ...; depth of soil.....
Kind of surface soil . .. . . ; kind of subsoil . ...

Water supply: Source ... ; quantity in dry summer months or during winter months . ; cost of upkeep . ...; supply in pastures.. ...

Buildings as suited to kind of farming .....; adaptability to another type of farming .. . ; cost of upkeep . . ; arrangement for economy of work .....; desirability of dwelling as a home . ...; condition of fences ... .; kind as regards cost of upkeep . .....; farm highways... ; shape of fields . ; nearness to farmstead....

Kind of orchards.. .....; condition.....
Adequacy of trees for home use ... .

Climate: As to growing season . . .. ; days available for farm work..... .. . .; healthfulness.....

Neighborhood: Character of people .. ..; available labor supply..... ....

Possibility of increase or decrease in value of land .. ..
Possibility of selling farm ... .
Possibility of renting farm. .. . .
Desirability of farm as a strictly business investment .. ..
Desirability of farm as a home or place to retire.... .. ..
Adaptability of farm to changing economic conditions necessitating change of type..... . ...
Adaptability of farm for enlargement of business ... .
Adaptability of farm for diversification or improved organization of the business.... . .. .
Adaptability of farm for high yields of crops and desirability for live-stock production..... ... .
Sureness of market for major crops grown .....

History of farm as regards management of land with respect to keeping up fertility.... .....
History of region as to development and speculation in lands as affecting present price .....
Number of other well-developed farms in immediate vicinity which are successful ..... How long have they been farmed?.. .....
What are some of the operators' difficulties? ... .
How soon can the farm be made a going concern? ....

QUESTIONS ON THE TEXT

1. Why do fewer people become millionaires in farming than in other occupations, in proportion to the number engaged?
2. Is the fact that a man has made money as a farmer always a proof that he is an efficient farm manager? Explain.
3. What are the special advantages in beginning farming in a region with which one is familiar?
4. In what respects is it more advantageous to settle in a region of developed farming than to settle in a frontier region? What are the advantages of the latter procedure?
5. Is cheap land always the best bargain?
6. What is meant by "faddism" in farming?
7. What considerations are important in the farm layout?

SPECIAL PROBLEMS

1. Write a short essay on the comparative advantages of life on the farm as compared with life in the city. (Assume about the same income in each case.)
2. Write a short essay on the ideal preparation for success in farming.
3. Write an essay on the training and experience needed by a farmer's wife.
4. Using the score card on page 39, score the farm on which you live.
5. What are the principal types of soil in your county? How can you determine each type by the plant growth?
6. Supposing the layout of the farm on which you now live had not been determined, make a map showing how you would plan the layout as to (*a*) location, size, and shape of fields; (*b*) location of buildings; (*c*) location and character of water supply; (*d*) location of roads; (*e*) location of fences and gates.

7. Taking your farm as it now is, make a map showing what economical changes you believe could be made in farm layout.

SUGGESTED READING

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WARREN, G. F., *Farm Management*, Ch. XIX.
BOSS, ANDREW, *Farm Management*, Ch. VI.
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FARM LAYOUT

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CHAPTER IV

FINANCIAL ANALYSIS OF THE FARM BUSINESS

I. The operator of the farm
II. Distribution of ownership
III. Analysis of income
    1. Gross income
    2. Charges against income
    3. Farm income
    4. Per cent of farm income to farm capital
    5. Labor income
    6. Distribution of income

In order to consider intelligently the problems of farm organization it is necessary to employ certain standard measures of success and efficiency.

It has been said that the true test of success in farming is maximum long-time net profits. In a general way this definition of success is important because it lays emphasis on the idea of long-time returns — that is, it calls attention to the point that a farmer may make large profits for a year or two at the expense of his soil fertility and the upkeep of his farm. A little consideration, however, will show that *net profit* in the technical sense in which it is used in business accounting is not easily determined in farming. In a popular sense *profit* is a vague term variously employed. It is important, therefore, to analyze the income of the farm into its various parts.

I. The operator of the farm. — *The person who is mainly responsible for the carrying on of the farm business may be called the operator of the farm.* It should be noted that the operator is not necessarily the owner, for he may be a tenant or he may rent additional land. Moreover, the operator is not necessarily

the manager of the farm, for the operator may employ a hired manager to supervise the actual farm operations.

The farm operator may be an individual, a partnership, a corporation, or a coöperative organization. In the United States by far the greater number of farms are controlled by individual operators. Here and there one finds instances of partnership, and not infrequently large farms, ranches, or plantations are operated by corporations. According to the Federal *Statistics of Incomes*, 7,887 agricultural corporations made income tax returns for the year 1918. In Italy, Roumania, and other European countries there has been considerable tendency toward the operation of farms by coöperative organizations of farm laborers.[1]

II. Distribution of ownership. — In order to illustrate some of the usual ways in which the ownership of the farm business may be distributed, it is desirable to employ a concrete illustration. In Table 2 it is assumed that a certain farm operator began farming some years ago. He put $3,000 into the business at the start. *This money which the operator invested at the beginning we may speak of as the operator's initial investment.* Since that time the operator has put an additional $4,000 from outside the farm into the business. In all, therefore, he has put in $7,000 from outside the farm business. *The total amount put into the business by the operator we may call his original investment.* In addition to this he has borrowed $6,000 and the farm property has increased in value $4,000 so that the total value of the farm assets under the legal ownership of the operator is $17,000, against which there is a debt of $6,000. *The operator's total investment, therefore, is $11,000 — this is the*

[1] In Russia and other countries where radical economic experiments have been carried on, there has been a tendency to develop the Soviet form of farm operation — that is, farming is carried on as a communal undertaking. This is a new and radical policy and has not been sufficiently tested by experience.

value of the farm assets owned by him, less his indebtedness. It will be noted that of this $11,000 only $7,000 was actually put into the business by the operator. The remainder represents income from the business reinvested including increase in value of property during the period of ownership.

TABLE 2. FINANCIAL ANALYSIS OF A FARM BUSINESS

I. Analysis of ownership

	Owned by Operator	Owned by Landlord	Borrowed by Operator	Total for Farm
1. Fixed capital . . .	$15,000	$10,000	($5,000)	$25,000
2. Operating capital . .	2,000	2,000	(1,000)	4,000
3. Total capital . . .	$17,000	$12,000	($6,000)	$29,000
4. Total investment of operator	11,000	——	——	——

In addition to the capital owned by the operator a part of the farm capital is owned by the landlord, amounting to $12,000. Thus, *the total farm capital* is $29,000. Of course the ownership of farm capital may be much simpler than is assumed in the illustration. The simplest case would be that where the farmer owns all the farm capital without any indebtedness.

It is sometimes customary to distinguish between *fixed* and *operating* capital. *By fixed capital is meant the value of the land, buildings, fences, and other permanent structures. In operating capital are included machinery, work stock, productive live stock, feed and seed on hand, general supplies, and cash to run the business.*

III. Analysis of income.

1. *Gross income.* — The gross income of the farm includes farm receipts, the living obtained from the farm by the family,

and that part of the board of hired labor supplied from farm products. In the illustration (Table 3) the gross income of the entire farm is shown to be $3,900, of which the operator receives $3,500 and the landlord $400.

TABLE 3. FINANCIAL ANALYSIS OF A FARM BUSINESS

II. Analysis of income

	Operator	Landlord	Entire Farm
1. Gross income:			
a. Farm receipts (including net gain by inventory)	$3,000	$300	$3,300
b. Living obtained from farm	300	100	400
c. Board of hired labor obtained from farm	200	—	200
	3,500	400	3,900
2. Charges against income:			
a. Farm expenses (including net loss by inventory)	1,400	100	—
b. Board of labor obtained from farm products	200	—	—
c. Family farm labor	200	—	—
d. Operator's labor	400	—	—
	2,200	100	2,300
3. Farm income	—	—	1,600
4. Per cent of farm income to farm capital	—	—	5.5+
5. Labor income	$790[1]	—	$550[2]

[1] Obtained by deducting from farm income plus the value of operator's labor ($400) the interest due on operator's debt (6 %), the net rent paid the landlord ($300), and 5 per cent on the operator's invested capital ($11,000 @ 5 % = $550).

[2] Obtained by deducting from the farm income plus the value of the operator's labor ($400) a charge of 5 per cent on the total farm capital ($29,000).

a. Farm receipts. — These include all money received for sales of farm produce and also the net gain by inventory due to the actual physical growth of stock or crops or to an increase in the value of the farm property.

b. Living obtained from the farm. — This consists of the value on the farm of all farm products used for family living, together with the rental value of the dwelling, provided the value of the residence is included as part of the farm capital.[1]

c. Board of hired labor obtained from products of the farm. — This item should be included in gross income. This is all the more necessary when board of hired labor is counted as an expense. However, omitting the latter would not necessarily balance exactly the omission of the former, for the two items may not be identical in amount.[2]

2. *Charges against income. — Charges against income comprise all the items which must be deducted from gross income to determine how much the farm business has earned net during the year.* Charges against income include farm expenses, the value of unpaid family farm labor and the value of the operator's labor.

a. Farm expenses. — These include all payments made on account of the farm business including any net loss by inventory.

c. Family farm labor. — This comprises only the unpaid labor of the family, not including that of the operator, employed in the actual business of farming but not household work.

d. Operator's labor. — Operator's labor includes only that labor which is equivalent to the labor of the hired man — the actual work in the fields and in doing chores but not time spent

[1] In most farm surveys the value of the dwelling is included in farm capital because of difficulties encountered in excluding it.

[2] In studies of farm income the value of that part of the board of hired labor supplied by products of the farm generally has not been included in receipts.

in supervision alone. In other words, it is that labor which the operator would have to hire in case he did not do it himself.[1]

3. *Farm income. — Subtracting the charges against income from the gross income of the farm leaves a remainder which we may call farm income.* This is the net income earned by the entire farm business without reference to how this income will be distributed among those furnishing the different portions of capital and without deducting any charge for the time of the operator spent in supervision. In the illustration, the gross income of the farm business is $3,900. The charges against income amount to $2,300. The difference of $1,600 is *farm income.*[2]

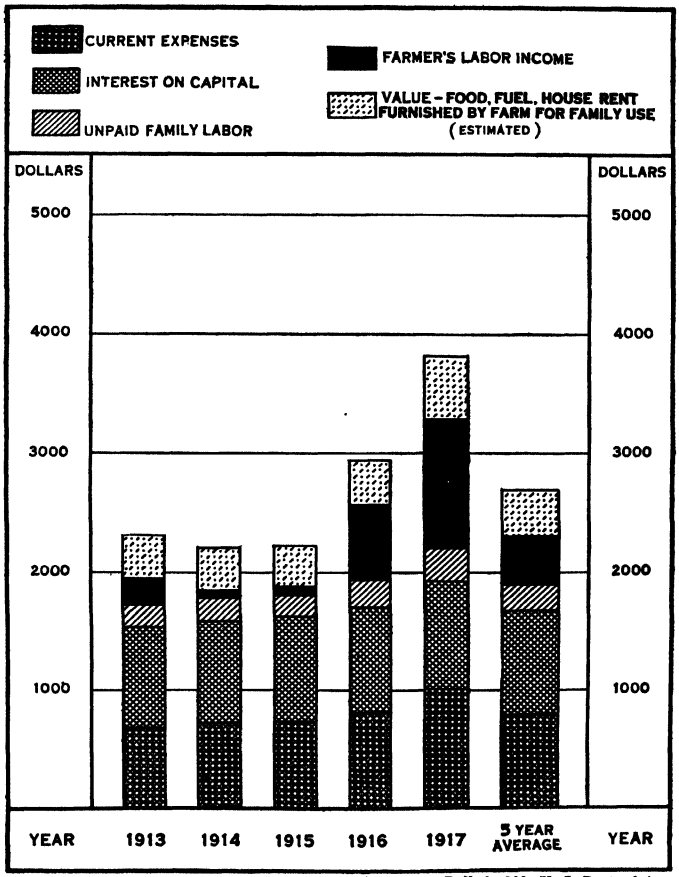
4. *Per cent of farm income to farm capital.* — Farm income measures the gain of the farm business as a whole. However, it would not be fair to assume that two farms which yield the same farm income but involve unequal amounts of capital have been operated with equal efficiency. For instance, suppose that on a farm with a capital of $30,000 the farm income is $3,000, while in the case of another farm representing a capital of $60,000 the farm income is also $3,000. The comparison is better made in terms of per cent of farm income to farm capital.

5. *Labor income. — It has been customary to deduct from farm income a certain per cent on the value of capital employed in the farm business. The remainder is called labor income.* If, as suggested above, the value of the physical labor of the

[1] It may be noted that in the current practice of analyzing farm income the operator's labor is not deducted as a charge against income. However, it would hardly be accurate to compare the results of management on one farm on which the farmer devoted a large part of his time to actual field work with the results on another farm where he hired this work done, devoting his time to supervision.

[2] It should be noted that this amount is smaller by $400 than it would be if the value of the operator's labor were not included in charges against income.

farmer has been deducted as an expense in determining *farm income*, it will be necessary in determining *labor income* to add the value of the farmer's physical labor to farm income and deduct from this sum the allowance for the use of capital. *Labor income* is supposed to represent that part of the farm income which is left to pay for the labor of the farmer after proper allowance has been made for the use of capital. However, it should be noted that in reality it does not represent exactly what the farmer has left to pay for his labor. This is due to several reasons. For one thing, the rate charged for the use of capital is merely an assumed rate. It may not correspond with what the farmer actually pays for the capital which he obtains from other sources. For instance, if the rate charged is 5 per cent he may be paying 4 per cent or 6 per cent for his money. If he is a tenant or if he is an owner renting additional land ("owner additional"), he may be obtaining a large part of his capital at a rate quite different from the assumed rate charged. It is frequently true that the rent of land, especially in the case of cash rent, is a smaller per cent of the value of the land than the usual rate charged for the use of capital. Consequently, if one deducts, say, 5 per cent for the value of all the capital of the farm in order to obtain labor income, while in reality the capital of the farm is obtained by renting it at a rate of 3 per cent, it is obvious that the labor income shown is much smaller than the actual labor income of the operator. It has been suggested that this difficulty be met by employing two terms to designate labor income obtained by different methods—*the term "farm labor income" to apply to labor income obtained by deducting 5 per cent or some other assumed rate on the entire value of the farm capital; the term "operator's labor income" to designate the labor income arrived at by deducting the actual rent paid for the use of land and 5 per cent or some other assumed rate on the remainder of the farm capital.* (See Table 3.)



Department Bulletin 920, U. S. Dept. of Agr.

FIG. 10. — DISTRIBUTION OF GROSS INCOME

(Sixty farms in Verona and adjoining townships, Dane County, Wisconsin, 1913–1917)

If free from debt the interest on investment and value of family labor may give the farm family considerable income to dispose of even in years when labor incomes are low.

6. *Distribution of income.* — In the study of farm economics it is frequently desirable to analyze the income of the farm, especially the *farm income,* into various component parts corresponding with the actual income obtained by different persons participating in the farm business or representing the shares in income attributable to the various factors of production.

TABLE 4. FINANCIAL ANALYSIS OF FARM BUSINESS

III. Distribution of income

	Operator	Landlord	Borrowed Capital
a. Interest on capital borrowed by operator (6%)	——	——	$360
b. Operator's net return	$940	——	——
c. Per cent of operator's net return on investment ($11,000)	8.5+	——	——
d. Operator's income	1340	——	——
e. Farm family income	1540	——	——
f. Wages of management	500	——	——
g. Operator's profit	440	——	——
h. Per cent profit on investment	4.0	——	——
i. Landlord's net return	——	300	——
j. Per cent of landlord's net return on his capital	——	2.5	——

a. Interest on capital borrowed. — It will be noted that when a considerable part of the capital has been borrowed, a portion of farm income must be used to pay interest on this borrowed capital. In the illustration (Table 4) it will be seen that in the case of this particular farm $360 is the amount required for this purpose (6 per cent on $6000).

b. Operator's net return. — If we deduct from farm income the shares that must be paid to the landlord and for interest on capital borrowed by the operator, the remainder may be called operator's net return. This remainder represents what has been

earned by the operator for the use of the capital actually owned by him and for the time spent in supervision and the risk incurred, but does not include the value of the time spent in actual farm work. In the assumed illustration the operator's net return is $940.

It frequently may be serviceable for purposes of comparison to find the percentage of operator's net return to the value of his investment. In the case of the illustration above, the operator has obtained a net return of 8.5+ per cent on his investment of $11,000. This may be considered to be how much he has been able to earn from his capital with the accompanying supervision of the investment to be compared with what he might earn with the same capital, together with necessary amount of supervision in other lines of business.

d. Operator's income. — *If we add to operator's net return the value of the amount allowed for the actual labor performed by the operator, we get what may be called the operator's income* — the total actual income received by the operator from the farm business. In the assumed illustration the operator's income is $1,340. This is the amount which he receives for the use of his capital and for the time which he devotes to the business.

e. Farm family income. — In addition to the income of the operator it will be noted that in obtaining farm income deduction was made for the value of the unpaid labor contributed to the farm by the family. *If we add to the operator's income the amount allowed for family labor we obtain what may be called the farm family income* — the actual income of the entire farm family obtained from the farm. In the case of the illustration this amounts to $1,540. Of course, the family may also obtain an additional income from sources outside of the farm business.

g. Operator's profit. — Operator's net return includes not only the return for the use of the farmer's capital but also for

the actual time devoted by the farmer in supervision. It may be worth while, however, to allow for the latter in order to determine how much the capital has earned. This is especially desirable in making comparisons with farms where a hired manager is employed at a definite salary. *Deducting from operator's net return the allowance for wages of management leaves what may be called operator's profit* — the return for use of capital and for the enterprise of the operator in employing it in the particular business. In the assumed illustration $500 has been deducted for wages of management, leaving an operator's profit of $440 which is 4 per cent on the operator's investment ($11,000).

i. Landlord's net return. — Landlord's net return is the difference between the gross income received by him and such expenses as he incurs in connection with the farm property or the farm business. In the assumed illustration the landlord has received gross income of $400, including the value of living obtained from the farm, while he has incurred expenses of $100, leaving him a net return of $300, which is 2.5 per cent on that part of the farm capital owned by him.

QUESTIONS ON THE TEXT

1. Define farm operator. Is the operator necessarily one individual? Does the operator always own all the invested capital?
2. Distinguish between fixed capital and operating capital.
3. What is meant by the gross income of the farm? What main classes of items are included in gross income?
4. Do farm receipts consist only of the money taken in? Explain.
5. What are some of the forms in which an inventory gain may be manifested?
6. What main classes of items are included in charges against income?
7. Show that if board of hired labor furnished by the farm is included in charges against income it should also be included in gross income.
8. Define farm income, and show that farm income is not identical with the income of the farmer.

9. What is the principal purpose for which we want to know farm income?

10. Show that in making comparisons of different farms it is better to employ per cent of farm income to total capital as a basis of comparison rather than farm income alone.

11. Define labor income. Does it represent exactly the return for the farmer's labor? Why?

12. Define operator's net return, and explain how it is calculated.

13. How does operator's income differ from operator's net return?

14. Distinguish farm family income from farm income; from operator's income.

15. Distinguish operator's profit from operator's income; from labor income.

SPECIAL PROBLEMS

1. The following are some of the financial items for a certain farm: The total capital is $19,720; of this the landlord owns $13,560, and the operator owes debts amounting to $4,245 on which he pays 6 per cent interest. (This is the general rate of interest in the community.) The total farm receipts for the past year were $4,927, and the value of the family living obtained from the farm amounted to $582. In addition to this, hired laborers received milk, vegetables, wood, and other things from the farm amounting to $329. The total farm expenses were $1,624. It is estimated that the family labor other than that of the operator was equivalent to $318, and that the operator's time employed in farm work would have cost $510 if hired. The operator paid a rent of $587. Of the total farm expenses the landlord contributed $183.

On the basis of the above items calculate the following: (*a*) gross income, (*b*) charges against income, (*c*) farm income, (*d*) percentage of farm income to farm capital, (*e*) labor income, (*f*) operator's net return, (*g*) operator's income, (*h*) farm family income, (*i*) operator's profit, (*j*) landlord's net return.

(Note: With slight changes in the basic figures, the above problem should be assigned to each student in the class.)

2. How does the problem of calculating labor income of operators who own their farms differ from the problem of calculating the labor income of a tenant?

3. Would the addition to labor income of the value of family labor give the total income received by the family from the farm?

4. Show that if a farmer pays off a mortgage the payment may be in-

cluded in expenses for the year in which paid, since the payment will be offset by change in inventory.

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(See also list of readings for the next two chapters.)

CHAPTER V

SOME UNITS OF ECONOMIC MEASUREMENTS IN FARM ORGANIZATION AND MANAGEMENT

I. Measuring general success
II. Measures of the factors of production
    1. Measures of productive area
    2. Measures of live stock
    3. Measures of labor
III. Measures of diversity
IV. Measures of productiveness

I. The measure of general success. — It is customary to use the labor income of the farm as a method of comparing general success and as a means of determining how much the various factors of efficiency have contributed to this success. However, it is frequently not safe to employ labor income as a means of deciding the question of efficiency in farm organization. For instance, in employing labor income to determine what size of farm is most efficient, we are confronted with the difficulty that the larger sized farms should have larger labor incomes because of the greater amount of capital employed, even though this capital has been allowed for in determining labor income; consequently it would not be safe to assume that the larger sized farms are the most efficient merely because they produce the largest labor income. To overcome this difficulty, the term *adjusted labor income* has been employed. *This is determined by grouping the various farms studied according to size in acres and finding the per cent that the labor income of any particular farm is to the average labor income of the group in which it belongs.* Thus, if a farm belonging to the group 40 to 80

acres has a labor income of $500, while the average labor income for the entire group is $400, the *adjusted labor income* of the farm would be 125 per cent. Suppose it is desired to compare this farm to another farm belonging to the group 280 to 320 acres, with a labor income of $2,000, while the average labor income for the group is $4,000. The *adjusted labor income* for this second farm is 50 per cent. In comparing it with the first mentioned farm it is obvious that the labor income of the larger farm is four times that of the smaller farm, but the *adjusted labor income* is less than half, indicating the conclusion that the farm of the larger labor income for its size is less efficiently organized and managed than the farm of the smaller labor income in proportion to its size.[1]

While *adjusted labor income* overcomes some of the difficulties in using labor income for this purpose, it is probable that usually a much simpler solution of the problem is to employ the per cent of farm income to total farm capital in making comparisons between different farms.

Many erroneous conclusions concerning relative efficiency in farm organization and management have been reached through the tendency to express success in terms of gross or net product per unit of some thing used in production, such as land, man labor, horse labor, etc. For instance, many people assume that the most efficient farm is the farm which shows the largest gross product per acre, either in terms of physical measures or in terms of value. A moment's thought, however, will show that this method of comparison is subject to the criticism that a farmer may achieve a very large product per acre by incurring such heavy expense that his net product will be very small.

In recognition of the above difficulty it is sometimes suggested that we may measure efficiency by net product per acre — that

[1] There are other theoretical objections to the use of labor income as a measure of farming efficiency which cannot be mentioned here.

is, by dividing the farm income by the total acreage. While this overcomes the above objection, yet it is subject to a number of other objections. The farmer is seeking the largest possible operator's income. By devoting all of his time to managing one acre of truck crops, he may make a farm income per acre of $400, but he would not be as well off as if he managed a farm of 160 acres with a farm income of $10 per acre, for in this case the total farm income would be $1,600. Similar objections may be offered to employing units of other things used in production for the purpose of comparing product per unit, as for instance, total product per cow, total product per unit of man labor, etc.

One should not conclude from the above statements that it is undesirable to have a large product per acre, per cow, or per man. In fact, it is highly desirable to increase the product per unit of these factors provided the increase is not attained at too great expense or by too great a sacrifice of other factors of efficiency.

II. Measures of the factors of production. — Economists have usually employed the term *factors of production* to include land, labor, and capital, recognizing these as the basic elements that contribute to all production. It is true that all the agencies of production may be logically classified under these three heads. However, it is more convenient from the standpoint of farm organization to recognize the following groups of factors:

Land

Buildings and other improvements (fences, water systems, roads, etc.)

Machinery and tools

Work stock

Productive live stock (meaning live stock that yields a direct income)

Miscellaneous supplies, such as fertilizer, seed, and feed stuffs

Man labor

Upon the relative proportions of these various factors largely depends the success of the farm enterprise. For the purpose, therefore, of comparing proportions, it is necessary to have definite methods of measuring these various factors.

One way of expressing the proportions of these factors is to take the total sum of their value and find the proportion that the value of one factor is to the total value. For instance, for purposes of comparison of different farms we may employ the per cent of the value of buildings to total farm capital; the per cent of value of productive live stock to total farm capital, etc. However, in making such comparisons it is necessary to exclude the value of man labor from the total, for although a number of men may be on hand at a particular time, their services are not capitalized, and man labor cannot, therefore, be included in the total sum of farm capital, although this was formerly possible in the days of slavery.

1. *Measures of productive area.* — Suppose we are trying to compare the actual productive area of two different farms. Farm *A* contains 120 acres in all and farm *B* contains 160 acres in all. Farm *A* contains 40 acres of crop land and 80 acres of meadow; farm *B* contains 15 acres of crop land, 5 acres of meadow and 140 acres of pasture and waste land. Although farm *B* is larger than farm *A*, it contains land of such different character that it is hard to say whether the actual productive area is larger or smaller than that of farm *A*.

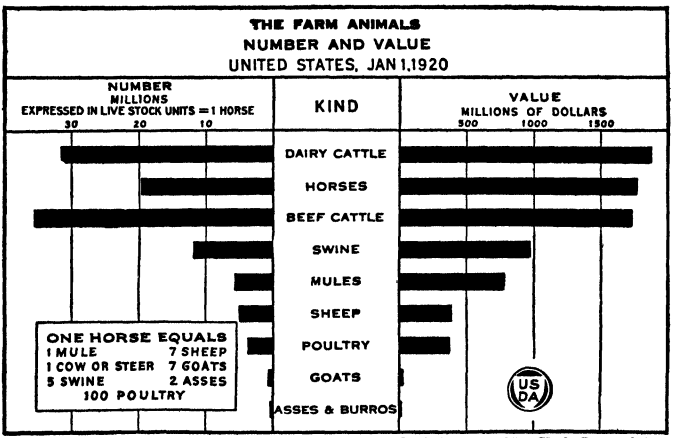
If we do not wish to consider pasture land at all, we can compare the *crop area* of two different farms, including under *crop area* both the land available for crops and the meadowland, but if we wish to consider all the land in the farm, it is necessary to employ some method of reducing pasturage to terms of *crop area. When the pasture acreage of the farm is reduced to the equivalent of the crop area, the expression is known as crop area equivalent.* To illustrate: A certain farm has 80 acres of land

in pasture and 120 acres in crops. It is found that the pasture will support one mature cow or horse for each 4 acres for a period of six months in the year. The hay land on the farm, which is included in the crop area, produces one ton of hay to the acre. If it be assumed that the proper ration of hay for a mature horse or cow is 30 pounds a day, it will be clear that, if 4 acres of pasture are furnishing the equivalent of 30 pounds of hay per day for a period of six months, this would be equal to 5,400 pounds of hay or 2.7 tons. If it takes one acre of hay land to produce one ton of hay, then it would require 2.7 acres to produce the equivalent to 4 acres of pasture. Thus the production of one acre in pasture will equal the production of .675 of an acre of hay land. Eighty acres of pasture, then, is the equivalent of 54 acres of hay land, and the total of the crop area and the *crop area equivalent* of the farm is 120 acres plus 54 acres or 174 acres as compared with the total area of 200 acres.

2. *Measures of live stock.* — If we are trying to determine whether one farm is more heavily stocked than another, it is also important to be able to compare the total number of live stock. This necessitates reducing the different kinds of live stock to some common denominator of comparison. *It has become customary to employ the term animal unit to mean one mature head of cattle or horses and to reduce other kinds of live stock to their equivalent in this unit.* On the basis of relative proportion of feed required it is generally assumed that the following are roughly the equivalents of an *animal unit:*

1 steer, cow, horse, or mule	1	animal unit
2 calves, heifers, or colts	1	" "
7 sheep	1	" "
14 lambs	1	" "
5 hogs	1	" "
10 pigs	1	" "
100 hens	1	" "

3. *Measures of labor.* — How shall we compare the amount of human labor on two different farms? One method is to compare the total wages paid during the year, including the value of unpaid farm labor. This gives a unit of comparison in terms of value between different farms. Another method of comparison is *average number of men per year.* This is obtained by finding the total number of months or fractions of



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FIG. 11. — NUMBER AND VALUE OF FARM ANIMALS

The left hand part of the graph shows the reduction of the live stock of the United States to terms of animal units.

months each man works, counting twenty-five days to the month for day laborers and thirty days to the month for regular laborers; finding the total number of months for all the men employed on the farm during the year; and dividing this total by twelve. The result is the average number of men per year.

Another useful expression is *productive work unit. This is an ordinary day's labor for one man. A productive horse work unit is an ordinary day's work for one horse.* These expressions

may be employed to determine the amount of labor required per acre for different farm crops. For instance, the productive work units of certain crops for Chester County, Pennsylvania, were found to be as follows:

	Man	Horse
Corn for grain	7	6
Corn for silage	6.5	7
Potatoes	10	9
Tobacco	20	7
Wheat, oats, or other grain, oat hay, millet, peas, and other forage	2	3
Hay	1	1
Alfalfa (two cuttings)	3	3

III. Measures of diversity. — Frequently it is considered that the degree of diversity of enterprises is an important element in the success of a farm business. However, it may be difficult to determine which of two farms is characterized by the greater amount of diversity. Suppose, for instance, that farm *A* contains 100 acres of wheat, 20 acres of rye, 3 acres of corn, and 1 acre of hay, while farm *B* contains 20 acres of wheat, 25 acres of rye, 30 acres of corn, and 26 acres of hay. It would be difficult without some mathematical measure to determine which of the two farms has the greater diversity of enterprises, — that is, kinds of crops and live stock yielding a direct income — for each farm has the same number of enterprises. *Theoretically, diversity is a resultant of two factors — the number of enterprises and the degree in which they approximate equality in importance.* Thus a farm with two enterprises of very unequal importance as sources of income would not be characterized by as great diversity as a farm containing two enterprises of nearly equal importance as sources of income.

Several methods of measuring diversity are employed. In a region where the general tendency is toward crop production, it may be sufficient to compare the percentage of total receipts from live stock to determine which farm or group of farms is

characterized by greatest diversity. If, on the other hand, one is in a region where live-stock farming predominates, as for instance, in the dairy region, it may be sufficiently accurate to compare the percentage of receipts from crops. Another simple measure of diversity is to compare the number of enterprises, each of which produces more than ten per cent of the gross receipts of the farm. A more definite mathematical expression of diversity is the *diversity index*. This is obtained by squaring the fraction that receipts from each enterprise represent of total receipts and dividing the sum of these squares into one. For instance, suppose in the case of a certain farm the gross receipts are divided as follows:

Enterprises	Receipts	Fractions of Total	Squares
Oats	200	.050	.00250
Wheat	1,000	.250	.06250
Dairy cows	1,200	.300	.09000
Hogs	600	.150	.02250
Sheep	400	.100	.01000
Orchard	600	.150	.02250
	$4,000	1.000	.21000
	$1 \div 0.21 = 4.76 +$ (diversity index)		

Absolute lack of diversity is expressed by the figure 1. Diversity of the farm is measured by the amount by which the diversity index exceeds 1.

IV. Measures of productiveness. — It is frequently useful to have some way of indicating how productive a farm has been in a given year. For instance, if one is trying to explain large earnings for the year it is important to indicate whether this is due to unusually good crops. It may also be important in explaining the relative success of different farms in the same neighborhood to be able to indicate how they compare from

the standpoint of productiveness per acre. In the case of single crops one may employ the *single crop index*. This is calculated by dividing the product per acre of the crop by the five-year average yield per acre for the entire state or region under consideration and multiplying the quotient by 100. Thus, if corn on farm *A* averages 20 bushels to the acre and the average for the state is 40 bushels, the *single crop index* will be 50. To find an expression of the total productiveness we may employ the *composite crop index*. To obtain this, divide the total yield of each crop by the five-year average yield per acre for the state or region under consideration, add the quotients, and divide the sum by the total acres in crops for the farm. Let us assume, for instance, that a farm produces 800 bushels of corn; 1,000 bushels of wheat; 10 bales of cotton; and 20 tons of hay. The average yield for the state is 40 bushels of corn; 20 bushels of wheat; $\frac{1}{2}$ bale of cotton, and 2 tons of hay. We shall have the following method of calculation:

$$\begin{aligned} 800 \div 40 &= 20 \\ 1{,}000 \div 20 &= 50 \\ 10 \div \tfrac{1}{2} &= 20 \\ 20 \div 2 &= 10 \end{aligned}$$

The total of these quotients is 100; the total area in crops is 91. 100 divided by 91 is 109+. This is the composite index for this farm.

QUESTIONS ON THE TEXT

1. What are the advantages and disadvantages of each of the following as measures of efficiency in farming: (*a*) labor income, (*b*) adjusted labor income, (*c*) per cent of return on investment?
2. Show that neither gross product per acre nor net product per acre is the best measure of efficiency.
3. Define the factors of production, and name the important classes of factors.
4. What is the purpose of employing crop area equivalent?
5. What is an animal unit?

6. How can you compare two or more farms from the standpoint of the relative amount of labor employed?

7. What is a productive work unit?

8. Discuss some of the ways of measuring diversity.

9. How could you compare the total productiveness of each of two or more farms?

SPECIAL PROBLEMS

1. Farm *A* contains 75 productive acres and has a labor income of $614; farm *B* has 268 productive acres and a labor income of $906. All the farms of the community may be grouped as follows: those with less than 50 productive acres have an average labor income of $304; those with 50 to 100 acres have an average labor income of $509; those with 100 to 200 productive acres have an average labor income of $763; those with 200 to 300 productive acres have an average labor income of $979. Find the adjusted labor incomes of farm *A* and farm *B*.

2. The values of various factors of production other than labor on farms *A* and *B* are as follows:

	Farm *A*	Farm *B*
Land	16,000	4,000
Buildings and improvements	2,000	2,000
Machinery and tools	1,600	400
Work stock	900	300
Productive live stock	3,000	200

Compare the two farms as to the proportion of each factor to total investment.

3. A certain farm has 2 horses, 6 cows, 14 sheep, 14 lambs, 25 hogs, 60 pigs, and 200 hens. Find the number of animal units.

4. A farm has 320 acres of pasture, capable of supporting 64 mature cows for six months of the year. The hay land of the farm produces 1½ tons per acre, and the ration for a cow is 25 pounds of hay a day. Find the crop area equivalent.

5. The average values of the various products sold by a certain farm are as follows: wheat, $2,400; oats, $600; milk, $1,200; potatoes, $1,800; hogs, $600; orchard products, $400. Find the diversity index.

6. A certain farm produced 150 bushels of wheat from 10 acres, 40 tons of hay from 20 acres, 1,600 bushels of corn from 40 acres, and 700 bushels

of oats from 35 acres. The five-year average production per acre for the state was 12 bushels of wheat, 1½ tons of hay, 30 bushels of corn, and 35 bushels of oats. Find the crop index for each crop and the composite crop index for the entire farm.

SUGGESTED READINGS

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CHAPTER VI

FARM RECORDS AND ACCOUNTS

I. Miscellaneous records
II. Records designed mainly to show the financial standing and financial relations of the business as a whole
    1. Inventory
    2. Use of the inventory alone to show net gain or loss
    3. Records of current receipts and expenses for the business as a whole
        a. Unit of the accounting system
        b. Time unit of accounts
        c. Economizing in the number of entries for items in the accounts
        d. Classification of items
    4. Combination of inventory and current receipts and expenses to show the net gain or loss of the business as a whole
III. Cost accounts
    1. Nature and scope of cost accounts
    2. What records shall be kept

Although usually conducted on a small scale as compared with manufacturing and commercial enterprises, the farming business is exceedingly complex, involving numerous details. It is important that there be some means of recording these numerous details and especially of revealing the sources of profit and of loss so that the farmer may so adjust his business as to increase the former and eliminate the latter.

If farmers are to be induced to maintain systems of record keeping, such systems will have to be so devised as to permit the work to be done at convenient seasons and also

avoid the requirement for minute accuracy which is necessary in city bookkeeping. In this connection it is important to remember the difference between the essential purposes to be accomplished by keeping records. The bookkeeping of city businesses largely involves recording the financial relations between the business and other persons or businesses. It is essential that the record be accurate to the last cent. For instance, a bank must endeavor to keep accurately the debits and credits of its depositors and of those who borrow from it. A farmer, however, has comparatively few such personal relations. He should be interested more particularly in internal affairs of his business for the purpose of finding out what farm enterprises are sources of profit or of loss and what processes of farm activity are economical.

The different kinds of farm records that the farmer may need to keep may be grouped under three main classes:

I. Records of miscellaneous facts and events
II. Records to show the financial standing and financial relations of the business
III. Cost accounts

Each of these groups needs to be separately considered.

I. Miscellaneous records. — In this class of records may be mentioned: egg records; animal records, such as dates of breeding, dates of birth, weight; milk records; weather records; dates of beginning and ending of various activities, as for instance, planting, harvesting, and threshing; quantities and kinds of seed, fertilizers, and other materials employed. The old-fashioned farmer endeavored to keep these facts in his memory. Nowadays, however, more systematic records of some of these facts are needed. For the most part, if a farmer maintains a system of cost accounting, many of these miscellaneous facts will incidentally be recorded in the cost accounting. Thus a system of cost accounting may be made to show the dates of various farm activities, the kinds of ma-

Thursday, Sept. 14, 1916

	Man. Hours	Man. Min.	Horse Hours	Horse Min.
Cloudy South wind. Rain in evening				
Finish drilling wheat in south field	4	12		
Used 22 bushels seed and 1800# commercial fertilizer				
At town in P.M. Arranged for renewal of insurance on buildings and for $500 more on farm contents				
Pat and team helped Smith draw wire with silo filling				

Financial Account	Received	Paid Out
6 doz eggs @ 34¢	2 04	
2 bus. apples @ 80¢	1 60	
Paid Andrews & Co for seed wheat		
24 bushels @ $1.25		30 00
2 bags wheat bran @ $1.40		2 80
Strap for harness		50

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FIG. 12. — A DIARY FOR FARM WORK AND ACCOUNTS

Sample page of a diary with two columns on the right, used for a memorandum of farm work and of financial transactions. A diary may be a useful supplement to a system of farm accounting, and, if no regular system of accounting is maintained, a carefully kept diary may be used to record a great deal of useful information, although it is hardly a substitute for a good system of farm records.

terials employed, the prices paid for various articles used in production, the quantities and kinds of seed, fertilizer, and other materials employed. However, if considerable numbers of live stock are kept, it will usually be desirable to keep special live stock records, and when poultry is a principal farm enterprise, poultry records may be serviceable. Sometimes the keeping of a farm diary may be a useful method of recording miscellaneous facts that are not provided for in more systematic records.

II. Records designed to show the financial standing and financial relations of the business as a whole. — Financial records are employed for several purposes: to record relations between the individual or business and outside individuals or businesses; to record receipts and expenditures and the purposes thereof; and to show the net gain or loss of the business. It has already been noted that the recording of financial relations with other individuals or businesses is not so important for farms as it is for other kinds of business enterprises. Ordinarily the farmer does but little credit business. With the modern system of issuing credit slips with purchases one can usually keep a record of purchases from a store by simply filing the duplicate slips. This will avoid the necessity of putting down in one's financial records numerous small items purchased on credit.

Accounts showing receipts and expenditures may be kept for the business as a whole or for any part of the business. For instance, one may keep an account of receipts and expenses for dairy cows, for the corn crop, or for the clover crop. If such a system of accounts is to show the net gain or loss of the business as a whole or of any part of the farm business, it must involve not only a record of money receipts and expenses but also an inventory.

1. *The inventory.* — An inventory may be used alone to show financial gain or loss of the business, or it may be used in conjunction with records of expenses and receipts. *An in-*

ventory is an itemized list of property on hand at a given date, arranged according to certain important classes of property, together with a list of debts due by the business on the date the inventory is taken. The following is a simple illustration of a farm inventory:

INVENTORY OF RIVERDALE FARM

Items	March 1, 1918	March 1, 1919
Land and buildings	$26,130	$28,355
Machinery and tools	1,932	1,826
Live stock	3,036	5,263
Feed and supplies on hand	2,710	1,605
Bills receivable	306	120
Cash belonging to farm business	385	108
	34,499	37,277
Bills payable	11,240	10,683
Net worth	23,259	26,594

It will be noted that this is a mere summary of the numerous items of property included in the farm. Originally in taking an inventory one would list each item under the various classes.

2. *Use of the inventory alone to show net gain or loss. — The difference between the value of property owned and the debts due by a person or business on a given date is called net worth.* If the values expressed by the inventory are accurate, it may be used to show financial gain or loss of the business during a certain period of time by subtracting the total net worth at the beginning of the period from the total net worth at the end of it (or vice versa in case of loss), but in so doing there are important allowances to be made.

Thus, in the above table it appears that there has been a gain in *net worth* of $3,335 during the year. However, the farmer has had a living from the farm during the year, including

not only food, fuel, and shelter furnished by the farm but also money taken from the farm business to purchase necessities and luxuries. It is even possible that the farmer may have withdrawn capital from the business to be invested in some other business. He may have done this by selling some of his crops, live stock, or other property. On the other hand, the farmer may have invested additional funds in the business during the year. For instance, he may have inherited some money or sold some bank stock and put the money into the purchase of live stock so that the increased value of live stock may be due in whole or in part to this outside source rather than to production on the farm.

In consequence of these facts the inventory will show the net gain for the year's business only if allowance is made for the value of all property, whether in money or in kind, taken out or put into the business during the year. Moreover, one should make allowance for the value of labor furnished by the farm family when employed in actual farm activity as distinguished from household activity and on the other hand should credit the business with the value of living obtained from the farm.

In taking an inventory or in keeping farm accounts of any kind it is important to take the inventory or begin the system of accounting at the time when the main products of the farm for the year have been sold and before operations for the new crop year have been begun. In many regions this is also the time when most tenant contracts begin and when sales of farms are consummated. Thus, in the Corn Belt March 1st is considered the best time for beginning the fiscal year; in parts of the Winter Wheat Belt, August 1st; and in the Cotton Belt, ordinarily January 1st.

It will be noted that in taking an inventory the great majority of the items will be written down at the beginning of the year, and at the end of the year it will be necessary to make note only of the changes in the list and of course in the values of the items.

The entire list need be written only once. Some economy of time in taking the inventory is possible by a continuous inventory providing columns for more than one year so that the original list will largely suffice for several inventories.

3. *Records of current receipts and expenses for the business as a whole.* — Although considering the time required the inventory is probably the most fruitful form of farm accounting, it should be supplemented, if possible, by records of receipts and expenditures, for these supply a check on the accuracy of the inventory and also detailed information concerning the financial transactions of the year.

The simplest method of recording receipts and expenditures is to make a list of transactions as they occur. Such a list may be kept in an ordinary *daybook*, putting the items of expense in one place and the items of receipts in another in the order in which they occur. It is generally customary to put *expenses* on the left hand page of an open book and *receipts* on the right hand page. In Figure 13 is shown an illustration of such a list of transactions. A brief inspection of this list will suggest a number of problems which we need to consider.

FIG. 13. — EXPENSES AND RECEIPTS OF JOHN SMITH, YEAR ENDING MARCH 1, 1920

	EXPENSES				RECEIPTS		
Mar.				Mar.			
1	1 qt. lubricating oil for machinery		50	1	Sold 60 bu. corn @ 1.60	96	00
4	Potato seed for garden, 2 bu. @ $2.50	5		9	Hired team of horses to neighbor for 1 week	18	
9	1 gallon of vinegar		20	16	Sold 2 doz. eggs @ 45c		90
16	New plow	24		24	Milk sold for past week 1800 lbs. @ 2.60	46	80
24	1 pr. of shoes for John	4	25	Apr.	Sold mare to John		
31	Wages to farm hand for March	45		6	Williams	160	
Apr.				18	Received check for dividends on stock in bank	240	
6	Fire ins. policy for 3 yrs.	23	20				
12	Paid int. on mtg. for 6 mos.	120					

a. Unit of the accounting system. — It is important to know what is the unit for which accounts are kept. In Figure 13 expenditures listed include money paid out not only for the farm but also for the family or for the personal expenses of the farm operator. Similarly, receipts include money coming in not only from the farm but also from other sources, as in the case of dividends on bank stock. If the unit of accounting is John Smith, then all money paid out or received by him will be included in the accounts, but if the farm is a unit, the above mentioned items, unrelated to the farm, would not be included.

If a man has but a few business transactions or relations outside of the farm business, it is just as well to make the farmer himself the unit of accounts, for expenditures and receipts unrelated to the farm can be easily separated from the general list of accounts either by inspection or by classifying the items in separate accounts. Commonly, items related to the person rather than to the farm business are included in a personal account, and sometimes another account is maintained for the family, as distinguished from the farmer himself. In a personal account, too, it is possible to record capital invested in the business, whether originally or subsequently, and capital taken out of the business either for the purpose of investment in other lines of business or for the personal use of the farmer and his family. In more elaborate systems of accounts the record of capital put in and taken out is provided for in what is known as a *capital account.* Ordinarily, however, such an account is not needed for farm accounting.

b. Time unit of accounts. — As already noted, it is important that one decide on a definite accounting period. Usually a year is the unit, but the time of beginning and ending must be definitely determined. Moreover, it is important to see that items entered in the accounts belong to this time unit. Various payments or receipts occur which overlap in their bearing on the accounting year. An illustration of this is shown by the

item of interest on mortgage for six months in Figure 13. Since the accounting year began March 1st and the interest was paid for six months on April 12th, it is clear that a part of this interest belongs to the previous year's business. Less than one third of the payment represents interest for the current year.

c. Economizing in the number of entries for items in the accounts. — It is obvious that if every single transaction made by a farmer during the year is included in the system of accounts the number of entries becomes very considerable and the amount of time required for keeping the accounts very great. It is, therefore, important to employ methods of reducing the number of necessary entries. An examination of the cashbooks of eight farms showed the average number of cash transactions per farm in one year was 577. Even this average number did not represent the total number of possible entries that might have been made.

One important economy is in the household account. Each day numerous small items may be purchased, such as needles, tea, sugar. If an entry is made for each of these items the total number will be very great. It is quite possible to economize such entries by keeping the daily credit or cash slips for the period of a month, at the end of which time only the total need be recorded unless it is desired to divide these purchases among several different accounts. For instance, if one is keeping an account with the cows and another account with machinery, it is possible that one would desire to charge those purchases made for cows, such as feed, to the cows' account, the purchases of machinery and implements to the machinery account, and the remainder of the items to the household or personal account.

d. Classification of items. — In Figure 13 some of the items have to do with the corn crop, others with the horses, still others with the family living expense, with the machinery, cows, poultry, etc. It is clear that if such entries are numerous it

would be necessary to sort them out so that similar items may be grouped together. This sorting is very important. It really involves a classification of all transactions and upon the method of analysis employed depends how much will be revealed from the system of accounts.

FIG. 14. — FORM ILLUSTRATING SPECIAL COLUMN DAYBOOK

RECEIPTS

1920		ITEMS	CORN	HORSES	POULTRY	DAIRY COWS	FAMILY AND PERSONAL
Mar.	1	Sold 60 bu. of corn @ $1.60	96.00				
	9	Hired team of horses to neighbor for week		18 00			
	16	Sold 2 doz. eggs @ 45¢			0.90		
	24	Milk sold for week				46.80	
Apr.	6	Sold mare to John Williams		160.00			
	18	Received check for dividends on stock in bank					240.00
		Totals	96.00	178.00	0.90	46 80	240.00

EXPENDITURES

1920		ITEMS	GARDEN	MACHINERY	LABOR	GENERAL	FAMILY AND PERSONAL
Mar.	1	1 qt. lubricating oil for machinery		0.50			
	4	Potato seed for garden, 2 bu. @ $2.50	5.00				
	9	1 gallon of vinegar					.20
	16	New plow		24 00			
	24	Pair of shoes for John					4.25
	31	Wages paid for March			45.00		
Apr.	6	Fire insurance premium for 3 yrs.				23.20	
	12	Paid int. on mtg. for 6 mos. ending Mch.				120.00	
			5 00	24.50	45.00	143.20	4.45

The classification itself may be done at the end of the year or at the end of each week or month, a separate book being used

for the purpose and the items being taken from the daybook for the purpose of being entered in this separate book. However, it is possible to make this classification at the time when the original entry is made by using what is called a *classification* or *multi-column daybook* or cashbook. Figure 14 illustrates the character of such a book. The items are entered direct to the separate accounts or classes to which they belong but in the order in which they occur and without having to turn to separate pages to find the different accounts. The headings employed in the illustration are simply those made necessary by the entries shown in Figure 13.

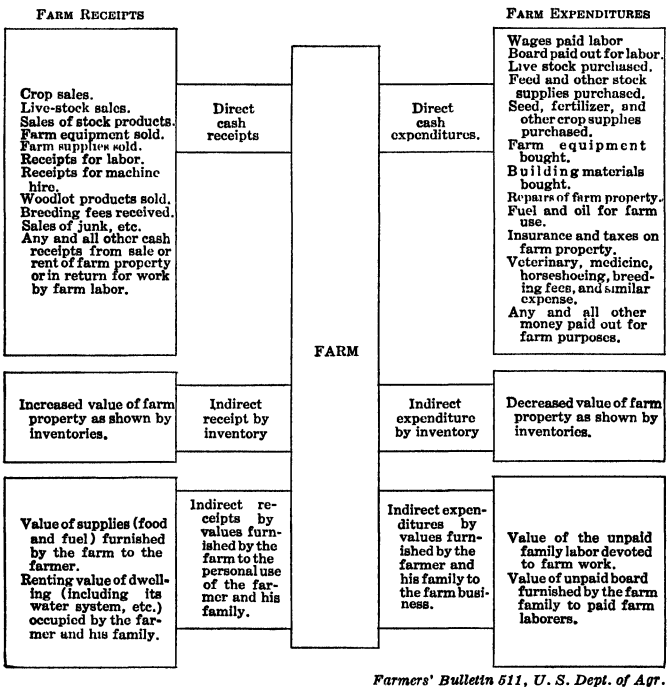
The determination of how to classify the entries is really the question of what separate accounts shall be kept. We shall return to this question in considering farm cost accounts.

4. *Combination of inventory and current receipts and expenses to show the net gain or loss of the business as a whole.*

A record of current receipts and expenses without inventories is not sufficient to show the net gain or loss because it does not show changes in farm capital. For instance, if a farm business showed receipts of $3,000 and expenses of $1,500 it would still be necessary to make allowance for the increase or decrease in the number and value of live stock and other farm property, for the large money receipts might be due to selling part of the farm equipment and live stock during the year, resulting in a diminution of capital. On the other hand, these receipts may not be a sufficient measure of the farm income because of a large increase in the amount and value of farm property. Expenses, for instance, may show payment for a new tractor, but it is probable that one would not want to consider this entire payment as an expense of the current year. A herd of steers may have been sold for $3,000, which was on hand in 1919, and it would not be desirable to credit this year's business with the entire $3,000.

These limitations in the use of receipts and expenses alone

for the purpose of showing net gain are remedied by combining such receipts and expenses with the inventory. Suppose farm receipts are $3,000, farm expenses $1,200, and that there is a net gain of $600 in the inventory. In this case the total net gain



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FIG. 15. — A CLASSIFICATION OF FARM RECEIPTS AND EXPENSES

of the farm is $2,400. If there had been a net loss of $600 in the inventory the net gain of the business would be only $1,200 — that is, net gain by inventory is added to receipts in the first instance and net loss to expenses in the second.

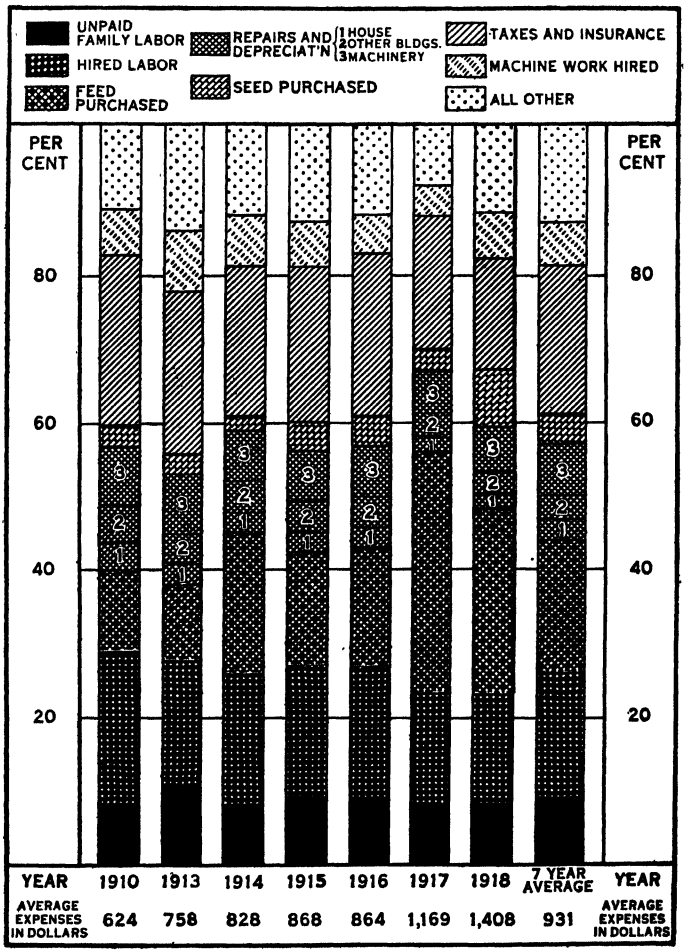
It is possible to determine the net gain of the farm business and also numerous important and significant details with reference to the factors affecting success or failure even without keeping detailed accounts throughout the year, depending on the farmer's memory and such written memoranda as he may have kept.

This is accomplished by the survey method of analyzing the farm business, as employed by the Office of Farm Management and Farm Economics, United States Department of Agriculture, and also by Departments of Farm Management in various states. The individual farmer can use the method to advantage in analyzing his own business, although such a method is not a substitute for systematic record keeping.[1]

III. Cost accounts. — 1. *Nature and scope of cost accounts.* — Generally speaking, the difference between purely financial accounting and cost accounting is that the former is based on money transactions, while the latter involves estimating various values. Another difference is that financial accounting usually seeks the gain or loss of the business as a whole together with the personal relationships of the business, while cost accounting involves an attempt to locate the source of gain or loss in the business.

In farming cost accounts may be kept with one single farm enterprise or with each of several enterprises or for the entire business, showing not only the cost and net returns of the business as a whole but also the sources of gain or loss. If one keeps cost accounts with a single enterprise or with only two or three important enterprises, greater reliance must be placed on estimates than if a more complete system is kept for the farm

[1] For fuller description of the method see "A Method of Analyzing the Farm Business," by H. M. Dixon and H. W. Hawthorne, *Farmers' Bulletin 1139*, United States Department of Agriculture. This is a revision with slight changes of *Farmers' Bulletin 661*.



Department Bulletin 920, U. S. Dept. of Agr.

FIG. 16. — A SIMPLE CLASSIFICATION OF FARM EXPENSES

as a whole. This is illustrated by Figure 17 which is a summary of the cost accounts for a single enterprise.

FIG. 17. — A SAMPLE ACCOUNT WITH POTATOES IN A 14-ACRE FIELD [1]

CHARGES			CREDITS		
1913	Items	Amount	1913	Items	Amount
June 3	Seed, 160 bu, @ 45c	$72.00	Oct. 5	Sold 226 bu. @ 60.18c	$136.00
4	Corrosive sublimate, 3 oz.	.30	20	Sold 510 bu. at 62c	316.20
10	Seed 43¾ bu. @ 55c	24.06	Nov. 1	Sold 241 bu. @ $1.083	261.00
11	Corrosive sublimate, 6 oz.	.60		Saved for seed, 135 bu. @ $1	135.00
July 12	Paris green, 6 lb.	1.32		Saved for home use, 16 bu. at 60c	9.60
15	Lead arsenate, 160 lb.	14.40		Residual manure, 60% of 1911	18.00
	Use of land, 5% on $100 per acre	70.00		Residual manure, 30% of 1910	6.00
	Man labor, 796 hours, at 19.02c	151.40			
	Horse labor, 839 hours, at 10.46c	87.76			
	Equipment labor, 839 hours, at 3.5c	29.36			
	Manure, 60% of 1910 application	12.00			
	Manure, 100% of 1911 application	30 00			
	Total charges	$493.20			
	Gain	388.60			
	Grand total	$881 80		Total credits	$881.80

It will be clear that some of the items in the account represent actual money transactions and require no estimates. This is true of the entries for seed and spraying material. Some of the other items, however, would have to be estimated unless other accounts were kept besides that of the single enterprise of potatoes, and even then a certain amount of estimating would be necessary. For instance, the items of man and horse labor involve the work done at different times, and usually it would be necessary to keep some record of this in order to

[1] Reproduced from "A System of Farm Cost Accounting," by C. E. Ladd, *Farmers' Bulletin 572*, United States Department of Agriculture.

know the exact number of hours employed. Moreover, it is still necessary to know at what rate per hour to charge for man labor and horse labor. To do this accurately would involve keeping a special account with man labor and also with horse labor, for the cost of each per hour must first be ascertained, and then it will be necessary to know the total number of hours employed so that the cost per hour may be determined. Likewise the cost of equipment per hour must be estimated unless an account has been kept with equipment.

However, it may be possible for the farmer to keep cost accounts with a single enterprise or with several enterprises that will enable him to get some ideas of cost even though it is necessary to make numerous estimates. It is probable that a special labor record should be kept for each enterprise so that the amount of man or horse labor may be more accurately known than is possible by the making of estimates.

Farmers often ask if there is not some simple method of keeping cost accounts that will involve but little time and trouble. But the greater the simplicity of the system the less the extent and accuracy of information one can obtain. The problem that each farmer must determine for himself is how much and what kind of information he desires. Many farmers may not desire to go farther than the keeping of accounts with one or more of the enterprises of the farm as just described. Others may wish to keep a well-rounded system of cost accounting, and it is therefore desirable to describe the essential elements of such a system and some of the special problems that must be met.

2. *What records shall be kept.* — The records necessary for such a system will comprise a book of original entry, a labor record, and a financial ledger. The book of original entry may oftentimes be simply a notebook in which the farmer may enter each money transaction at the time it occurs, together with labor performed, quantities of feed used, disposition made of

seed, feed, manure; in fact, every item that will need to be entered later in the systematic records. Generally, only a few minutes will be required to enter the facts from the memorandum book direct to financial ledger and labor record at the end of each day's business. The labor record may be kept in an ordinary journal ruled as in Figure 18. One or more pages should be kept for each farm enterprise or other project for which labor cost is desired.

FIG. 18. — A LABOR RECORD FOR CORN CROP

1912		OPERATION	MAN (HOURS)	HORSE (HOURS)
Mar.	3	Plowing	4	12
	4	Harrowing	1	2
Apr.	6	Planting	1	2
	15	Cultivating, etc.	2	4

The unit of measure in the labor record is an hour for one man and an hour for a horse. If a man spends four hours and twenty minutes plowing with a team of three horses, the entry will be $4\frac{1}{3}$ man hours and 13 horse hours.

It will be noted that such a record not only has the advantage of giving the total labor required for the enterprise but also the time when each operation is performed and the labor required to perform it. This is a valuable source of information to the farmer in planning the process of production; for instance, in deciding whether to harrow or disk a field and in noting what time of year each was done. Such a record may also be employed in planning the distribution of man and horse labor between different enterprises so that such labor will be as fully employed as possible.

In case of a large farm employing a considerable number of hands, it may be necessary for each hand to keep a daily

record of his time and that of his team, reporting each night to the farmer or his bookkeeper.

The financial record or ledger is the book in which all entries will be in terms of money. Figure 17 above will serve to illustrate the form of such a ledger except that instead of keeping the charges and credits for each account on the same page, it is better to devote opposite pages to each so as to avoid crowding and especially to give more space for the description of the items. This description is very important, for it is a source of varied information concerning the farm business.

At the end of each year the total amount of man labor on each farm enterprise may be determined from the labor record. Let us suppose 120 hours of labor have been used on the corn crop. If the total number of man hours for the entire farm is 4,800, the corn crop has required $\frac{1}{40}$ of the total. If the total expense of labor in the labor account (ledger) is $800, it appears that the labor cost of corn has been $\frac{1}{40}$ of $800, or $20 — that is, 120 hours at $16\frac{2}{3}$ cents per hour. Corn can then be charged in the farm ledger with this amount in addition to the other money expenses of production. The same method may be used in distributing the value of labor used among other enterprises. The value of horse labor may be similarly calculated and distributed.[1]

QUESTIONS ON THE TEXT

1. Mention the different classes of records that may be kept on the farm.
2. What is an inventory?
3. What allowances have to be made in order that an inventory may show the net gain or loss of the farm business?
4. What is the best time of year to take the farm inventory in your community?

[1] For a more detailed description of the method see "A System of Farm Cost Accounting," by C. E. Ladd, *Bulletin 572*, United States Department of Agriculture.

5. Show the importance of determining definitely the business unit to which the accounts apply. Illustrate.

6. Show the importance of properly relating the entries in the accounting system to the time unit of the accounts. Illustrate.

7. Explain some of the ways in which farmers may economize in the number of entries to be made in the farm accounts.

8. Show the importance of classifying the various items in the accounts.

9. Show that in trying to determine the net gain of the business from a record of receipts and expenses, it is also necessary to consider changes in the inventory.

10. Distinguish cost accounts from financial accounts.

11. Show that the keeping of cost accounts necessarily involves the making of estimates.

12. What is a daybook? A multi-column daybook? A ledger?

13. Explain the method of keeping a labor record as a part of a system of farm cost accounts.

SPECIAL PROBLEMS

1. How may a diary be employed as a useful part of a system of farm records?

2. Plan a system of records for poultry (not involving accounts).

3. Plan a system of accounts with poultry.

4. Make an inventory of the farm on which you live.

5. The summarized inventory of a certain farm is as follows:

Items	Mar. 1, 1918	Mar. 1, 1919
Land and buildings	14,000	14,610
Machinery	912	816
Crops unsold	1,052	810
Growing crops (inventoried at cost)	643	427
Productive live stock	1,685	2,105
Work stock	640	640
Supplies	850	714
Cash	190	76
Bills receivable	610	570
Bills payable	430	110

On the basis of this inventory, calculate the net worth of the business for each year.

6. In the above inventory what classes of items show a gain? A loss? Can you tell from these facts what were the real sources of gain or loss of the business?

7. Assuming that the farmer sold some bank stock and invested $1,000 of the proceeds in the farm during the year and that he took out $1,660 for living expenses, what was the net gain of the business for the year?

8. Rule a sheet of paper in the form of a multi-column daybook to show receipts and expenses for the following accounts: work horses, poultry, cows, hogs, wheat, corn, machinery, garden, personal, bills payable, bills receivable, and cash.

9. Rule a sheet of paper in the form of a labor record.

10. Suppose you bought 1,000 bushels of corn which you will use to feed to horses, cows, and poultry, what are some of the ways of keeping account of the feed expense assignable to each of the different classes of live stock?

11. A farmer spends $300 in fall plowing in preparation for a corn crop to be planted in the spring, but his accounting year ends January 1st. By what methods can he meet this difficulty in his accounts?

12. Three calves are born during the year and are on hand at the end of the year. How may this be cared for in the accounts?

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CHAPTER VII

COST OF PRODUCTION

I. Accrued costs
II. Prime *versus* supplementary costs
III. Overhead costs
IV. Joint costs
V. Costs of by-products
VI. Opportunity costs
VII. Money costs *versus* basic unit costs
VIII. Kinds of basic unit costs
    1. Enterprise costs
    2. Product costs
    3. Costs of farm processes
    4. Costs of factors
IX. Some special problems connected with determination of costs
    1. Shall rent or interest on the investment be included in costs
    2. Shall farm products used in the production of other products be counted at their cost or at their value at the time of use

The purpose of this chapter is to define the various kinds of costs and to consider methods of estimating important kinds of costs involved in farm production.

I. Accrued costs. — *The various costs incurred during a given year that do not represent money paid out are called accrued costs.* The farmer may have bought various articles on credit for which he has not yet paid but which have been used during the year and therefore should be considered a part of the costs of that year. Moreover, a number of items of cost

are not paid for in cash, such as interest on investment, depreciation of farm improvements and equipment.

II. Prime *versus* supplementary costs. — *In most businesses, including farming, there are certain costs that must be incurred if the business is to be carried on but which do not vary in proportion to the volume of product. Such costs are spoken of as supplementary.* Thus the farm must have a certain general equipment of buildings, machinery, and work stock which in part will not increase in proportion to the increase in the volume of production undertaken at a particular time.

There are other kinds of costs that will vary with each decision concerning the increase or decrease of production. These are known as prime costs. For instance, a farmer with a given acreage in his farm and a given equipment in buildings and machinery may decide to plow up a part of his pasture and to plant it in small grain. Assuming that he already has sufficient machinery to do the work and sufficient buildings for storage and other necessary uses in connection with the additional acreage in crops, his prime costs would simply consist of such additional outlays for seed, labor, etc. as might be required to produce an additional acreage of grain. The significance of this distinction between prime costs and supplementary costs is that in deciding whether to undertake to plant the additional acreage, one need not count the supplementary costs, for any return above the prime costs of the increased acreage will be added to the total farm profits. In the long run, however, it is likely to be undesirable to follow the practice of charging only prime costs to a large part of the product, for the effect is to make costs of a particular enterprise appear unduly low and to make the product of the previous acreage bear all the burden of cost.

III. Overhead costs. — Somewhat similar to supplementary costs are *overhead costs*, sometimes called *indirect costs*. In farming, as well as in other businesses, there are certain general

expenses that it is not convenient to assign as costs against particular enterprises. Thus the telephone, taxes, cost of maintaining roads and ditches, are general farm expenses. They do not vary directly with the volume of production undertaken. Such costs may be distributed among the several farm enterprises according to some principle determined upon. One principle of distribution that may be employed is in proportion to the total direct costs of the various enterprises. *By direct costs we mean those costs which are clearly attributable to the carrying on of the particular enterprise.* For instance, one might distribute these overhead, or indirect, costs between corn, wheat, beef cattle, hogs, and other enterprises according to the amount of direct costs incurred in the production of each.

IV. Joint costs. — Sometimes two or more products have a joint cost. Thus wool and mutton or wheat and straw are produced at a joint cost. It would be difficult to decide how much of the total cost is assignable to each product. Frequently only part of the total costs of two commodities are joint costs. Thus when clover is sown with a small grain crop, the cost of preparing the land is joint but the harvesting of the grain and the subsequent harvesting of the clover are direct costs assignable to the respective products.

V. Cost of by-products. — Sometimes the production of one product results incidentally in the production of some other product. For instance, when one produces cotton an incidental result is the production of seed. The seed may be regarded as a by-product of the production of cotton. Sometimes what is a by-product in one country may become the principal product in another. For instance, in Australia and the Argentine Republic sheep are produced mainly for the wool, and mutton is a by-product. On the other hand, in some of the general farming regions of the United States sheep are raised primarily for the sale of spring lambs for slaughter, and wool is a by-product.

The problem of determining the cost of a by-product is essentially a problem of joint costs. The only reason for distinguishing the problem from that of joint costs is that in the case of a by-product more emphasis is laid on the importance of one product than on the importance of another and, there is a tendency to charge a larger proportion of the joint cost to the main product. The attitude is that the main product will be produced in any case and whatever may be received for the by-product is to be regarded as so much additional gain.

In fact, the significance of the whole problem of joint costs is that the producer at his discretion can assign a larger or smaller proportion of the joint costs to a particular product. His principal concern is that he receive enough for both products to cover the costs of both.

VI. Opportunity costs. — The farmer is frequently influenced in his decisions by what is called *opportunity costs — the advantage to be derived from one line of action is regarded as setting the minimum return that must be yielded by any other alternative line of action if the latter is to be selected in preference to the former.* Suppose, for instance, a farmer has a chance to earn $3.00 per day net for his labor in a neighboring rock quarry. In a sense this becomes the opportunity cost of any additional farm activity he might be considering, for unless that activity will yield at least $3.00 per day for the farmer's time he will not undertake it (other considerations aside). Similarly, a farmer may be able to make a net return per acre of $12.00 producing wheat. This may be said to be the opportunity cost of any other crop under consideration, say corn, for unless the corn would yield at least $12.00 per acre it would not be grown. (There are, of course, other considerations outside of the mere comparison of net returns. Some of these are discussed in Chapter IX.)

In a sense a number of estimated accrued costs may be regarded as opportunity costs. Thus the interest on the farmer's

capital invested in the farm is an opportunity cost, for he may consider that he can invest his capital in other ways than in farming and under equally safe conditions so that it will earn 6 per cent and that he must charge his farm products with interest at that rate.

It is not always wise in general studies of cost of production to charge the full opportunity cost. Sometimes the individual opportunity cost is much above the going rate for the same kind of service in the community. For instance, the time of a particular farmer may be worth $10.00 a day if employed in operating a store, but it may be that he can hire labor that will perform as much work per hour as he would perform on the farm at $2.00 a day (an *alternative cost*). It is clear that he would not be justified in charging his time against the crops and other farm enterprises at the rate of $10.00 a day under these circumstances.[1]

VII. Money costs *versus* basic unit costs. — When costs are expressed in terms of money they are likely to be of little permanent interest and of little help in estimating costs in other regions or at a later period of time because of the fact that money costs depend upon the prices that one must pay for the different factors of production, such as labor, materials, machinery, live stock, seed, or land. Since the prices of these factors are continually changing it is necessarily true that the money costs which they represent are also changing. Therefore, if costs should be expressed only in terms of money costs, studies of costs would have little permanent value. It is desirable to develop units of cost which are of a less changeable character — that is, *basic unit costs. Such costs comprise the physical quantities of the factors employed in production in relation to the physical contributions that such factors make to production.* For instance, in calculating the cost of any crop it is necessary to know how

[1] Opportunity costs are of special significance in the study of social aspects of value and costs.

much man and horse labor is required to produce it according to the methods of production employed. This may be expressed in terms of hours rather than in terms of money; if one knows the hours required and at the same time the rate of wages for such labor in the community, it will be possible to calculate quickly the money cost for such labor in the production of the crop and to vary these money costs in accordance with changes in wages. In other words, it is not necessary to determine anew the basic unit costs every time one wishes to estimate or calculate the costs of a particular enterprise. It must be recognized, however, that the development of basic unit costs that may be applied to all the varying conditions and methods under which crops are produced in different parts of the country will require a long time.

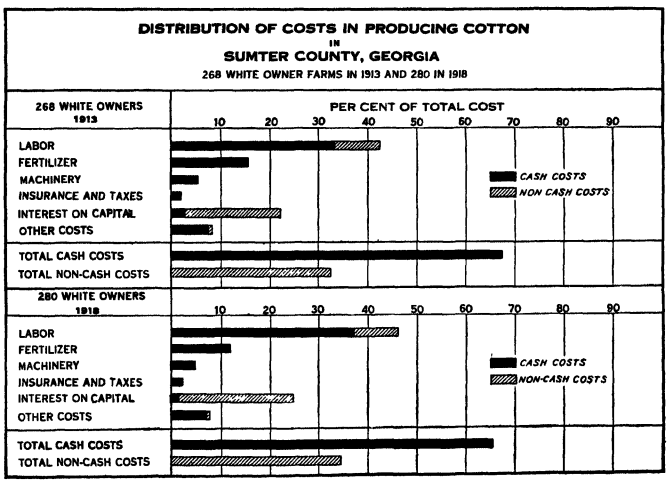
VIII. Kinds of basic unit costs. — The four most important kinds of basic unit costs are (*a*) the cost of enterprises; (*b*) the cost of products; (*c*) the cost of processes; and (*d*) the cost of various factors of production. These need to be separately considered.

1. *Enterprise costs.* — The farmer, as well as the general public, is interested in the cost of each main enterprise of his farm business. Thus he will want to know how much his dairy cows cost, how much it costs him to raise cotton or poultry. Since some enterprises result in more than one product, it is obvious that enterprise costs would not commonly be expressed in terms of the unit of production but must have some other form of expression. In the case of crops the unit may well be the acre or other unit of measuring land. In the case of stock or poultry one may take as a unit a head of stock.

It is clear that the cost of conducting a particular enterprise can be expressed only in terms of money cost, for the carrying on of the enterprise involves the use of various factors which can be reduced to common denominators only in terms of money. We have no other common unit of expressing such varied fac-

tors as quantity of labor, quantity of seed, quantity of fertilizer, quantity of horse labor, use of machinery, or time spent in supervision. However, in calculating enterprise costs one may assemble various data on basic unit costs.

2. *Product costs.* — The farmer is also interested in the cost of production per unit of product. Product costs



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FIG. 19. — DISTRIBUTION OF COSTS IN PRODUCING COTTON

A simple functional analysis of the costs of a farm enterprise.

differ from enterprise costs partly because of the fact that some enterprises result in more than one product and partly because product costs will customarily be expressed in the terms of unit of product. However, product costs are like enterprise costs in the fact that they must be expressed in terms of money. Product costs, of course, are even more variable and of less permanent value than enterprise costs. While enterprise costs differ by reason of variations in methods of

production, physical conditions of production, skill and efficiency of the farmer himself, and changes in the prices of the factors employed in production, product costs vary by reason of changes in all these conditions and also on account of variation in volume of production due to seasonal conditions, insect pests, crop diseases, and other circumstances.

3. *Costs of farm processes.* — The importance of determining the *cost of processes* is due to the fact that certain processes are likely to be common to many enterprises. Thus plowing, harrowing, and disking are processes that are likely to be employed in many kinds of crops. Obviously, if one knows the cost of these common processes, one may frequently estimate enterprise costs or product costs or estimate the comparative costs of varying the method of production. Thus one may wish to determine how much it would cost to add an extra harrowing to the preparation of a field for a crop. The difficulty in arriving at the basic unit cost of processes is due to the great variation in the methods of carrying on a process. Thus plowing may be done in many ways with different sized plows, different sizes of teams, or with other kinds of power, such as tractors.

The study of the costs of processes is important as a means of determining what is the most economical way of performing a particular process under given conditions. Thus one may determine what size team and what kind and size of implements make for the most economical method of plowing, disking, mowing, and other processes.

4. *Costs of factors.* — The importance of knowing the cost of the factors of production is because these factors are used in many combinations, both as to processes and as to enterprises. If one knows the costs of the factors, one can estimate the effect on cost due to varying the combination of the factors whether in processes or in enterprises.

Unfortunately, the information on most of these factors is

difficult to standardize and some of the information is not of very much practical value. The study of the cost of factors is likely to be subordinate to the study of the costs of processes. It is important, however, to know certain basic facts with regard to the cost of factors before one can properly calculate the costs of processes or enterprises. For instance, how much machinery depreciates, how many days in the year a machine will be used in a particular system of farming, what the requirements of the machine are in the way of oil, repairs, and fuel are basic to the problem of determining the relation of the use of machinery to costs of processes and enterprises.

IX. Some special problems connected with determination of costs. — While it is not possible in this connection to discuss all the problems of cost accounting it is desirable to refer to one or two much disputed points.

1. *Shall rent or interest on the investment be included in costs?* — It is argued that it is not proper to include rent or interest on investment in costs because these items represent part of the net returns of the business and should be included in net returns rather than counted as costs. However, so far as the individual farmer is concerned any interest or rent that he has to pay are included in his expenses and form no part of his profits; therefore, from the standpoint of his individual accounting he would be justified in regarding such payments as cost. Moreover, since the capital which he uses is employed in different quantities for different farm enterprises, it would hardly be accurate to compare the profitableness of these several enterprises without taking into consideration the interest on the amount of capital required for each.

However, if one is considering the relation of cost of production to the fairness of the price received for the product, the inclusion of rent and interest is of more doubtful propriety. This is due to the fact that land value is to a large extent determined by the net return attributable to the use of the land. (See

Chapter XIV.) If it is true that over a long period of time the rent payable for land is due to the profitableness of farming in that community which in turn is largely due to prices received for products, one may sometimes be reasoning in a circle to include this rent as a part of the annual cost of production in order to determine what is a fair price for the product. (For fuller discussion of this problem see Chapter XIV.)

2. *Shall farm products used in the production of other products be counted at their cost or at their value at the time of use?*—A number of the products of a farm are used in the production of other products. This is especially true of crops fed to live stock. There has been much dispute as to whether such crops should be charged to the live stock at what it cost to produce these crops or at what they might be sold for at the time of use. This question has been debated with especial warmth when attempts have been made to determine a fair price to be charged for milk in some of the large cities. The representatives of milk dealers and consumers have usually taken the position that the feed should be charged at what it cost to produce it, arguing that the farm is a unit devoted to the production of milk and that the feed was produced incidentally for the purpose of putting milk on the market. In support of this argument it has been pointed out that it would be no more justifiable to charge such feed at its possible selling price than it would be in factory cost accounting to charge each stage through which a product passes in being manufactured to the next stage at its selling price rather than at its cost. On the other hand, it is pointed out that many farmers buy a part of their feed and that since it is necessary to purchase feed at its value rather than at its cost, it is equally justifiable to charge the produced feed at its value. Furthermore, it is likely that if the value of the produced feed rises much above the cost of producing it, the farmer will be tempted to sell it unless he gets a price high enough for the live stock products to yield him as large a return for the

feed as he could get by selling it as such. Of course, where one has an established dairy business it is not usually practicable to dispose of one's feed merely because of the fact that the price is temporarily higher than at the time the feed was raised, for it does not pay to starve one's cows or to sell them off every time there is an increase in the value of feed. However, in the case of feeding beef cattle and hogs the farmer can adjust his feeding operations much more quickly to the variations in the price of feed and his actions are likely to be influenced rather by existing prices of feed than by cost of producing feed.[1]

QUESTIONS ON THE TEXT

1. Define and illustrate accrued costs.
2. Distinguish between prime costs and supplementary costs.
3. Give an illustration of overhead costs; of joint costs.
4. Show that part of the cost of a by-product is likely to be a joint cost with the principal product.
5. Give an illustration of an opportunity cost.
6. Show that basic unit costs are likely to be more permanently useful than ordinary money costs.
7. Name the various classes of basic unit costs and give an illustration of each class.
8. Under what conditions should rent of land or interest on investment be included in calculating the cost of production of farm products? Can you give reasons for excluding these items?
9. Should the feed used for dairy cows be charged for at the value of the herd in the market or at what it cost the farmer to produce the feed? Explain.

SPECIAL PROBLEMS

1. A farmer owns a tractor outfit which costs him $300 a year for depreciation, interest, repairs, and storage. He finds that he can use the machine 75 days a year and that the expense of fuel, oil, and labor for operation is $8 for a sixteen-hour day. By operating the machine in an eight-hour light shift he can cover 50 per cent more acres in a day at an extra expense of $4 a day for oil, fuel, and labor. Although he uses the machine on his own farm he could earn $2 an hour plowing for other farmers.

[1] For the discussion of the range of costs see Chapter XXV.

On the basis of the above facts, answer the following questions:

a. In what way are overhead costs illustrated in the above?

b. Do you recognize an instance of opportunity costs?

c. Which of the above are prime costs and which are supplementary costs?

d. Should the plowing done at night be charged at the rate of 50 cents an hour or at the rate of 66⅔ cents an hour? Why?

2. A farmer plants 50 acres of corn at a cost of $12 an acre, of which $4 is the cost of plowing. He follows the corn with oats, disking the land at a cost of $1 an acre instead of plowing it. To which crop would you charge the cost of plowing? What principle of cost does this problem illustrate?

(See also problems 3, 4, and 5, Ch. IX.)

SUGGESTED READINGS

(See list of readings, Ch. VI.)

PECK, F. W., "Methods of Conducting Cost of Production and Farm Organization Studies," *Bulletin 994*, United States Department of Agriculture.

ORWIN, C. S., "The Control of Farm Management and Some Principles of Agricultural Costing," *Journal of the Ministry of Agriculture* (British), Vol. XXVIII, No. 3.

COOPER, M. R., and WASHBURN, R. S., "Cost of Producing Wheat," *Bulletin 943*, United States Department of Agriculture.

FOX, D. S., "An Analysis of the Costs of Growing Potatoes," *Memoir 22*, Cornell Experiment Station.

PEARSON, F. A., "The Cost of Milk Production Computed on the Year Basis," *Bulletin 216*, Illinois Experiment Station.

MOOREHOUSE, L. A., and NUCKOLS, S. B., "Cost of Producing Sugar Beets in Utah and Idaho, 1918-1919," *Bulletin 963*, United States Department of Agriculture.

BAIN, J. B., and POSSON, R. J., "Requirements and Cost of Producing Market Milk in Northwestern Indiana," *Bulletin 858*, United States Department of Agriculture.

MOOREHOUSE, L. A., and COOPER, M. R., "The Cost of Producing Cotton" (1918), *Bulletin 896*, United States Department of Agriculture.

(A large number of bulletins on cost of production of various farm products have appeared in recent years, of which the above are only a few samples. The reader may also consult standard texts on cost accounting.)

CHAPTER VIII

SIZE OF FARMS

I. Methods of comparing size of farms
   1. Comparing intensive systems of farming with extensive systems of farming
   2. Comparing farming regions where there is great variation in per cent of crop land per farm, particularly when there is great difference in the quality of such land
   3. When the census definition of the farm does not correspond with the actual unit of farm operation

II. Size of farms under different systems of farming in the United States

III. Meaning of the expression "most economical size of farms"

IV. Conditions determining the minimum economical size of farms
   1. Making full use of essential and indivisible factors of production
      a. Land
      b. Buildings
      c. Man labor
      d. Horse labor
      e. Machinery and other equipment
   2. Application of the unit principle
   3. Minimum size of farm determined by the "peak" demand for the most essential indivisible factor of production
   4. Adjusting the size of farm to overhead expense

V. Conditions determining maximum size of farms for economic operation
   1. Influence of diversity of enterprises and intensity of cultivation on the size of farms
   2. Large-scale farming favored by cheap land

3. Large-scale farming may be made necessary by the existence of a class of ignorant or inefficient laborers who can be made efficient only under supervision
4. Large-scale organization makes possible the employment of kinds of equipment not usually possible for small farms
5. Necessity of extensive drainage or irrigation
6. Advantages in buying supplies, selling products, and obtaining credit
7. Greater efficiency and expertness in management
8. Routine character of operations
9. Influence of scarcity of capital
10. Influence of landlord's interest in intensive farming under the share system of renting land
11. Available time of manager or operator
12. Managerial capacity of operator

VI. General tendencies with regard to the size of farms
VII. Relation of size of farms to national welfare

It has been shown by numerous studies that the size of the farm is a matter of no small importance in determining one's success in farming. The size of farms is also an important question in the general national policy with respect to agriculture, particularly from the standpoint of the land policy that is to be followed.

I. Methods of comparing size of farms. — Generally, when we speak of a farm as being larger or smaller than another, we think of the relative acreage in the two farms. However, when the comparison is between dissimilar farming systems or regions which are quite unlike in character it may be necessary to employ some other measures.

1. *Comparing intensive systems of farming with extensive systems of farming.* — In comparing the size of farm businesses devoted to intensive farming — for instance, growing vegetables — with farms devoted to, say, general farming, the employment of acreage as a basis of measurement is likely to result in false conclusions. Under such conditions it is probably

better to compare size on the basis of total value of capital employed.

2. *Comparing farming regions where there is great variation in per cent of crop land per farm, particularly when there is great difference in the quality of the land.* — Under these conditions in comparing size of farms it may be found best to use the area in crops as the basis of comparison. This, however, is likely to prove imperfect if pasture is also a very significant phase of farming, as in dairy or live-stock regions. In this case it may be well to check the total acreage or crop acreage by the total value of the investment or to employ crop area equivalent as a means of comparison. (See Chapter V.)

The inaccuracy in thinking of the size of farms in terms of total acreage is likely to be especially great where rainfall is a seriously limiting factor in farming, as in the case of the arid and semiarid regions of the United States. There are great differences in average size of farms as one proceeds from East to West. The undesirability of disregarding these differences in considering the proper size of farms is shown by the unfortunate consequences that have resulted in trying to apply the 160-acre Homestead Act to the semiarid and arid regions of the West. (For discussion of this problem see Chapter XVI.)

3. *When the census definition of the farm does not correspond with the actual unit of farm organization.* — In considering the size of farm, it is important to have in mind the definition of a farm. The Census of 1910 defined a farm as *all the land which is directly farmed by a single person, managing and conducting agricultural operations, either by his own labor alone or with the assistance of members of his household or of hired employees.* It is pointed out that " A farm as thus defined may consist of a single tract of land or a number of separate or distinct tracts . . . and may be held under different tenures as where one tract is owned by the farmer and another tract leased

by him." This definition is not wholly satisfactory when one is considering the problem of the economical size of farms. In many sections of the country a farm is a definite physical unit made up of a certain tract of land provided with buildings, fences, drains, and other equipment suitable in kind and amount for the given area and may be provided with a definite layout or arrangement of fields, roadways, water supply, ratio of pasture to crops, and other arrangements which experience has shown to be adapted to physical units of size. However, several of these physical units may be directly farmed by a single individual, and there may be more or less degrees of personal supervision by such an operator. He may have a responsible manager on each farm and have personal charge only over the financial policy of the business, leaving the agricultural operations largely to his managers. Under the Census definition the entire group of physical farms would be counted as a single farm. Again, the Census definition may be misleading when applied to plantation areas in the South where a considerable number of croppers or tenants are farming under the close direction and supervision of a manager or owner of the plantation. Under the Census definition the land farmed by each cropper or tenant is counted as a farm. However, the plantation is frequently operated as a single unit from a physical and financial standpoint and is really the economic, though not the statistical, unit of operation. Finally, in some areas of the semiarid and arid West the land owned or leased by the ranchman or farmer frequently is supplemented by the use of publicly owned lands without lease.[1]

II. Size of farms under different systems of farming in the United States. — If we study the statistics on size of farms as

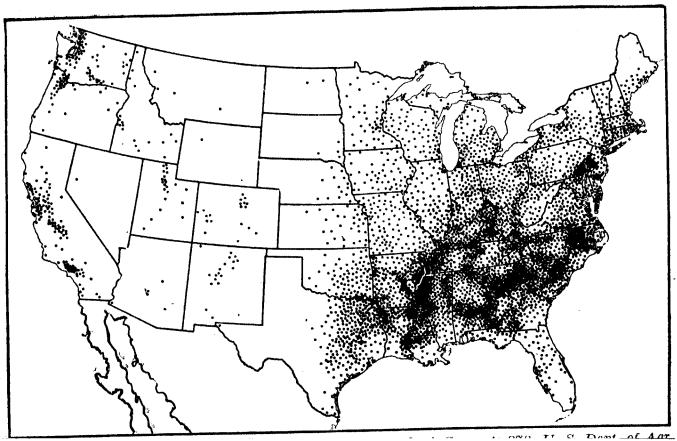
[1] It is not intended to suggest that the concept of a farm employed by the Census Bureau should be changed, so far as concerns its use for statistical purposes; but merely that the statistical results should be used with discrimination because of the difficulties pointed out above.

given in the United States Census, it appears that for each important prevailing system of farming there is a tendency for a large percentage of the total number of farms to fall within a certain size group. Thus in a large percentage of the cotton counties of the South the farms (as defined by the Census) are most numerous in the group ranging from 20 to 49 acres in size. On the other hand, in North Dakota, where small grain farming predominates, the most important size group is that from 260 to 499 acres.

III. **Meaning of the expression "most economical size of farms."**—This tendency toward the concentration of the largest number of farms in a group of a certain size may be taken to point to the conclusion that this group represents the *most economical size of farms* for that region or industry. Moreover, in various local surveys a group of a certain size appears to earn the largest profits and there has been a tendency to refer to this size as the *most economical size for that region.*

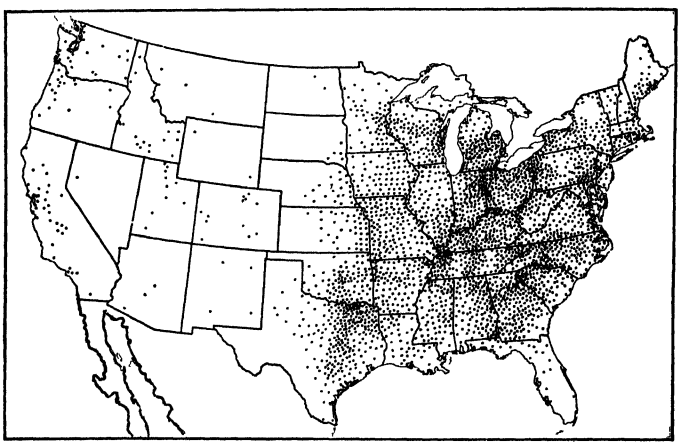
It is important to keep in mind the limitations of this conclusion. In the first place, the actual size of farms has been largely influenced by the land policy of the Federal Government or the states. On many individual farms, conditions may not be typical of those generally prevailing in the entire region, and moreover, many individual farmers may be men of greater or less ability than the average for the community. Consequently, it does not follow that for a particular farm or a particular farmer the size group which contains the largest number of farms is the size which is most economical. However, one should have good reason for attempting to operate a farm that is larger or smaller than the size indicated to be most suitable by the prevailing custom of the community.[1]

[1] For a number of reasons, some of which were suggested in Chapter IV, great caution should be used in drawing conclusions concerning most economical size of farms by employing labor income to indicate the most efficient size. The subject is too technical to be fully discussed here.



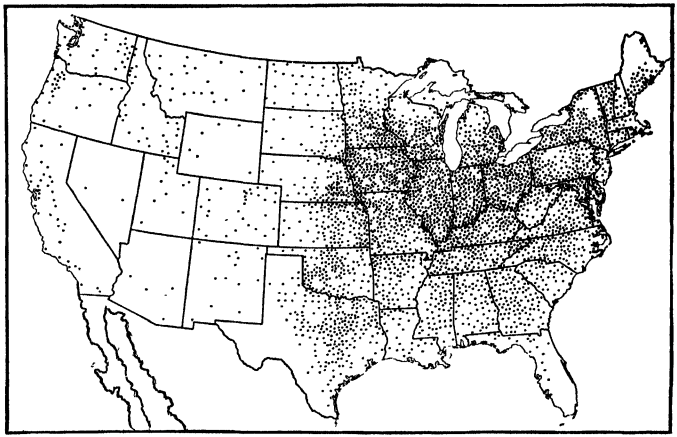
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FIG. 20(*a*). — FARMS OF LESS THAN FIFTY ACRES, JAN. 1, 1920. (Each dot represents 500 farms)



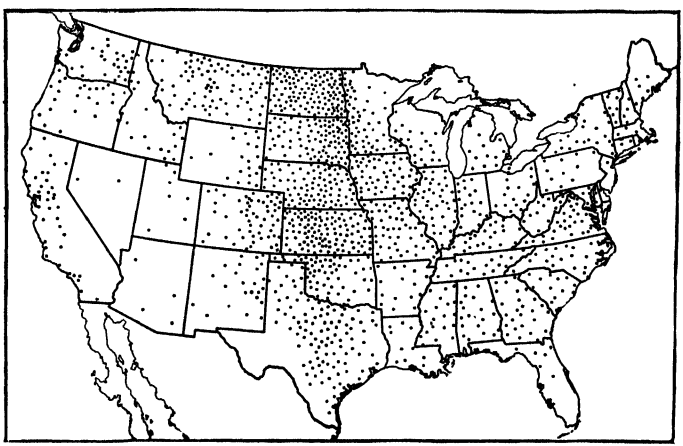
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FIG. 20(*b*). — FARMS OF FIFTY TO NINETY-NINE ACRES, Jan. 1, 1920. (Each dot represents 500 farms)



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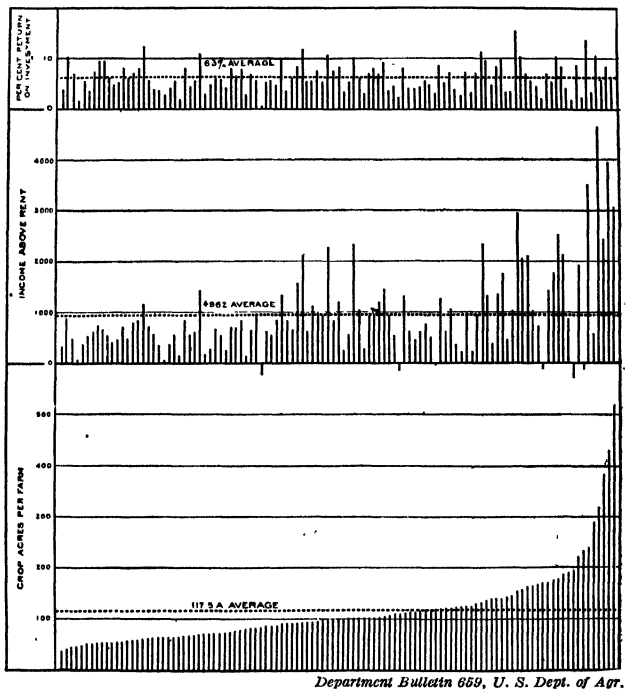
FIG. 20(*c*). — FARMS OF ONE HUNDRED TO TWO HUNDRED AND FIFTY-NINE ACRES, Jan. 1, 1920. (Each dot represents 500 farms)



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FIG. 20(*d*). — FARMS OF TWO HUNDRED AND SIXTY ACRES AND OVER, Jan. 1, 1920. (Each dot represents 500 farms)

IV. Conditions determining the minimum economical size of farms. — For purposes of clearness in discussion, it is necessary to distinguish conditions determining the minimum size



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FIG. 21. — RELATION OF SIZE OF FARMS TO RETURNS FROM FARMING. (Illustrated by data from 115 farms in Ellis County, Texas)

This graph shows the relation of size of farm (bottom) to income above rent (middle) and to per cent of return on investment (top).

of the farm from those determining its actual size or setting the maximum limit to its size. There are certain conditions which determine that it is not economical that the farm be smaller

than a certain size but which do not prevent the size of the farm being a multiple of this minimum unit.

1. *Making full use of essential and indivisible factors of production.* — It is obvious that the farm should be large enough to make as full use as possible of each of the essential factors of production so that no important factors will be seriously wasted through idleness. Some of the factors employed are so divisible that they may be used in almost any quantity however small. Frequently, there is a factor which is indivisible and which must be employed as a unit. On this account it may be desirable to have the farm organization large enough to make as full use as possible of the minimum unit of this indivisible factor. This principle may be called the *unit principle.* It is desirable to consider briefly each of the several factors of production from this standpoint.

a. Influence of land as a factor in determining size of farms.— Theoretically, land is one of the most divisible of the factors. This is especially the case in new countries where one may buy land in almost any amount. Frequently, however, even in new countries the size of farms is largely influenced by the land policy of the public or private agencies engaged in distributing the land. This is illustrated by the predominance of farms of 160 acres in the humid regions of our country where the homestead policy was employed. By the time a man had lived out the term of occupancy required to prove up his claim, the farm equipment, organization, private and public road system had been worked out to fit the area obtained from the Government, although frequently the area has later been found of uneconomical size, especially in rough or wet regions or because of semi-arid conditions.

In old countries it is not always easy to acquire just the amount of land one considers most economical for the farm. Thus in France and Belgium a law requiring a substantially equal division among the children and wife of the deceased

owner of the land has resulted in a tendency toward cutting up farms into small parcels. It is, of course, possible to increase the size of farm by renting additional land, provided the buildings and equipment of the farm justify it. This practice is very extensive in certain sections of the United States, but it is not so easily resorted to in old countries.

b. Buildings and other improvements. — Buildings are divisible into small units when being constructed. Thus one may erect as small a building as one may desire. The general tendency, therefore, is to make the buildings fit the scale of farming rather than to make the scale of farming fit the buildings. If the buildings are more extensive than is justified by the land area and other conditions, there is simply a tendency not to make full use of them. However, in some cases if one has extensive buildings one may be justified in increasing the size of the farm in order to make the fullest use of the buildings.

c. Man labor. — A farm could be small enough to occupy fully the time of only one man or even less if he has outside occupation. However, it is frequently necessary that the farm be large enough to give full employment to other members of the family. This is especially so, for instance, in the Cotton Belt, where it is customary for women and children to perform certain important operations in connection with the cotton crop.

There are strong advantages in having the farm large enough to employ fully the time of two men in addition to such work as the women and children may perform. There are frequent occasions when two men working together can do much more than two working separately; in fact, there are some operations that can be most economically carried on by a crew of men, for instance, threshing, filling silos, or spraying orchards.[1] However, these operations which justify the work-

[1] See, for instance, "A Study of Haymaking Crews and Labor Costs," by H. B. McClure, *Bulletin 576*, United States Department of Agriculture;

ing of men in crews or gangs continue but a short period of the year and can be provided for by hiring extra labor or by exchanging labor with other farmers.

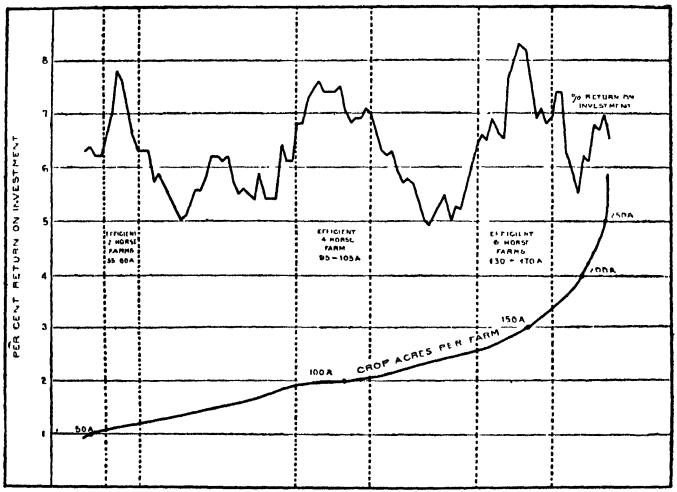
In factories this coöperation through division of labor is an important influence in determining size. The factory must be at least large enough to make possible the most efficient division of labor. This division of labor can be continued throughout the period of production. In farming, however, there is not sufficient gain through permanent division of labor to justify large farms merely for this reason.

In some sections of the country the size of farms is largely limited by the fact that hired laborers are either not obtainable or are obtainable under such unsatisfactory conditions that the farmers prefer to operate a farm small enough to enable them to do without such labor. For instance, in some of the newer sections of the country where land is easy to obtain there are districts where there are practically no hired laborers available, for every man who desires to farm finds it possible to obtain a farm of his own.[1]

d. Horse labor. — A farm may be small enough to make full use of one horse; but in most types of farming there are operations during the year that require more than one horse. In fact, in recent decades the development of multiple plows and other large implements and the tendency toward performing a number of operations at the same time, for instance, plowing, harrowing, or disking, have made large team units of three to six horses or mules economical. This usually makes it desirable to have the farm large enough to make full

"Crew Work, Costs and Returns in Commercial Orcharding in West Virginia," by J. H. Arnold, *Bulletin 19*, United States Department of Agriculture.

[1] Illustration of this is shown by a local study of the farming region around Milltown, Wisconsin. Unpublished manuscript entitled *Social and Economic Analysis of the Milltown Agricultural Community*, by Alonzo B. Cox.



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FIG. 22. — RELATION OF SIZE OF FARM TO EFFICIENT USE OF TEAMS

This graph shows the relation of size of farm to percentage return on investment, showing sizes favorable for most efficient use of two horses, four horses, and six horses. The bottom line represents the sizes of the various farms and the top line measures the per cent of return on investment. It will be noted that when the farm is about the right size for a given team unit the return indicated is high, while intermediate sizes show a lower return.

use both of the larger teams and of the more expensive machines. (For fuller discussion of the problem of economizing horse labor, see Chapter XII.)

e. Machinery and other equipment. — It is desirable to have the farm large enough to make as full use as possible of the machinery that makes for efficiency. There is too great a tendency to make the supply of machinery fit the farm rather than to make the farm of sufficient size to justify the employment of needed labor-saving devices, thus sacrificing efficiency. However, this tendency is found to a greater extent among the peasant farmers in Europe than among American farmers.

In general, one should have the machinery and equipment that make for economy in operation. Sometimes one finds a farm that is overloaded with machinery. Assuming that the machinery is of such a character as to make for economy of operations, this is just another way of saying that the farm should be larger in order to justify the expenditure for equipment. Some machines are in such small and inexpensive units that at least one can be kept on a farm of almost any size and be used sufficiently to justify keeping it — for instance, plows or harrows. There are some kinds of especially expensive machinery that can be obtained only in indivisible units. In the case of such machines, if the economy from the use of the machine is sufficiently great, it may be desirable to increase the size of the farm to such an extent as to make fairly full use of the machine. This observation applies especially to tractors, threshing machines, and the combines used in the grain industry.

While many kinds of farm machinery are obtainable in comparatively inexpensive units so that a small farm may be justified in their use, on larger farms there is likely to be a more complete use of each of these machines than on a small farm, and the economy resulting from this more complete use of the entire equipment in farm machinery may be considerable. (See Chapter XI.)

2. *Application of the unit principle.* — The most expensive indivisible unit which is necessary or important in production is likely to exercise most influence in determining the minimum size of farm for economical production, for the failure to use fully the less expensive unit is not so serious as the failure to use the more expensive. For instance, a sledge hammer may be needed occasionally on every farm, but it would be foolish to say that the farm should be large enough so that the sledge hammer would always be in use.

One way to avoid the necessity of enlarging the farm in order to make possible the fuller use of some expensive indivisible

factor is to hire the use of such a factor as a threshing machine or a tractor. Coöperation is another way by which one can benefit by the use of expensive units of production without owning outright.

Finally, it should be noted that changing the size of business is only one way to use factors of production to better advantage. Frequently, it is possible to make a full use of a given factor by replanning the field system or otherwise changing the organization of the farm. (See Chapter IX.)

3. *Minimum size of farms determined by the "peak" demand for the most essential indivisible factor of production.* — The need for each factor of production in agriculture varies with each season of the year. Thus man labor, horse labor, and machinery are needed more at one season than at another. Generally speaking, the supply of each factor must be great enough to meet the "peak" demand for its services. *By this is meant the demand for its services at the time of year when the largest quantity must be used,* unless additional amounts may be obtained by renting or by hiring. Thus on cotton farms where cotton is the main crop the "peak" demand for man labor occurs at the chopping season and the picking season.

4. *Adjusting the size of farms to overhead expenses.* — Not only is it important to adjust the size of farms so as to make economical use of the most expensive indivisible factors, but it is also important that the farms be large enough to justify the total overhead expenses. (Review definition, Chapter VII.) It is possible that a farm may be so organized that each factor is fully employed and even that every factor is justified by economy, and yet the total overhead expense of all the factors is not justified by the farm income. For instance, a farmer may have an equipment in machinery of which every machine may be justified by the fact that it economises labor and even that it is used with reasonable completeness throughout the year, yet the total annual overhead expense for machinery and other

factors may be so great that the receipts from the business do not justify this expense. What is needed is to increase the amount of income without correspondingly enlarging the overhead expense.

Generally, however, excessive overhead expense is due in part to the fact that certain kinds of improvements or equipment have been purchased which are not economical on account of the small size of the farm so that the unit principle is being violated.

Sometimes the remedy for this condition is not to increase the size of the farm but to make a change in the choice of enterprises so as to bring in larger receipts. In dairy farming it is frequently the case that a money or cash crop should be added. In general farming it may be that what is needed is the addition of some more intensive crop.

V. Conditions determining maximum size of farms for economical operation. — Statistics of size of farms in the United States justify the statement frequently made that the prevailing tendency is toward the family farm — that is, the farm that will make provision for the economical labor of the farm family, together with supplementary labor needed in busy seasons. However, statistics show also a very considerable number of farms of unusually large size, and the persistence of this type suggests that there must be certain conditions which favor the profitableness of such enterprises.

We have discussed the conditions that set the lower limit of size. It is now important to consider those that set the upper limit.

In our discussion we shall frequently find it necessary to use the expressions "large-scale" and "small-scale." These terms, of course, merely apply to relative contrasts in size. Small-scale does not necessarily mean very small units containing only a few acres. More generally it will signify farms of the ordinary family size as distinguished from those which are unusually large.

1. *Influence of diversity of enterprises and intensity of cultivation on the size of farms.* — The more diversified and complex the farm business the more likely it is that large-scale farms will be uneconomical simply because it is difficult to reduce the operations to routine, and therefore the possibility of large-scale operation with centralized management is greatly reduced. In general the regions where farms of unusually large size are numerous are those regions where the farming business is largely based upon a single main crop, such as cotton, sugar, wheat, the grazing of live stock, fruit, or potatoes. For the same reason a very intensive type of farming (for definition see p. 14) is likely to make greater demands on supervision than extensive farming. However, intensive farming may be carried on on a large scale when based on a single money crop.

2. *Large-scale farming favored by cheap land.* — Cheap land does not necessarily produce large-scale farming, but it is likely to be favorable to it because when land is cheap it is not so necessary to diversify agriculture in order to conserve the land nor is it so necessary to employ complicated methods of agriculture for this purpose.

3. *Large-scale farming may be made necessary by the existence of a class of ignorant or inefficient laborers who can be made efficient only under supervision.* — It is clear that, when the majority of farm workers are so ignorant as to necessitate supervision, it is economical to employ a sufficient number so that the supervision may be most economical. One man may be able to supervise twenty to forty laborers in routine operations.

4. *Large-scale organization makes possible the employment of kinds of equipment not usually possible for small farms.* — While the small farmer may hire the use of such equipment or obtain it by coöperation, he usually suffers the disadvantage of not being able to control the time of use or the method of operation. There is great advantage in being able to have wheat threshed or silage put up just at the time the crop is ready.

5. *Sometimes the necessity of ditching and draining the land tends to very large-scale farming* unless these operations are performed by coöperation or by land companies or other agencies which prepare the land and then sell it in small parcels.

6. *There are certain advantages under large-scale organization in buying supplies, in selling products, and in obtaining credit.* — The large-scale producer can frequently profit by buying supplies in carload lots or by shipping his product in carload lots. However, these advantages may be obtained by the small farmer through coöperative organization.

7. *Greater efficiency and expertness in management.* — The large farm can attract the managers of superior ability and skill who are abreast of the latest and most progressive methods. On the other hand, this advantage is offset by the superior ability of the small farmer to attend to details and minor economies which play so important a part in successful farming, especially if the farming system is diversified and intensive.

8. *Routine character of operations.* — Large-scale organization in agriculture is inelastic. As already indicated, large-scale organization is usually successful only when the operations are reducible to routine, but this very tendency to routine makes it difficult for the large-scale business to be adjusted to changing conditions of production, especially to changes in prices of the product.

9. *Influence of scarcity of capital.* — Frequently farms are smaller than the economical size because the farmer himself does not have sufficient capital to operate on the scale that would be most economical. Sometimes these conditions may be avoided by renting land instead of buying it and also by hiring some of the expensive kinds of equipment, such as tractors and threshing machines.

10. *Influence of landlord's interest in intensive farming under the share system of renting land.* — When the tenant pays a share of the crop in rent and the landlord does not contribute

largely to operating expenses, the latter is interested in as large a crop as possible. Hence, if the tenants are numerous and it is easy to obtain them, there may be a tendency for the landlord to restrict the area of each farm by dividing the land among a large number of tenants, thus compelling more intensive cultivation and a larger rent for the landlord.

11. *Available time of manager or operator.* — In the last analysis, the size of the individual farm is likely to be limited largely by the time and managerial capacity of the manager or operator. Some farmers are able to give full time to the management of their farms; others have other occupations or duties. For a particular man the first question is how much time he can devote to the farm business. Another question is how much time an individual farmer should devote to actual management and how much time to physical work on the farm. This is determined not only by age and health but also by one's capacity as a manager. Some farmers are exceedingly efficient as managers, and it would be unfortunate for such men to devote too much time to mere physical labor, leaving too little time and energy for thoughtful planning. After all, a man's physical labor may be worth only a few hundred dollars a year, while one may save much more than this amount by properly organizing the labor of others. On the other hand, some farmers of small capacity for management make the mistake of spending too much time in the work of management, fretting over minor details and making "much ado about nothing," when they would be better employed in physical work. For the farm of ordinary size some physical work by the manager is desirable. Even when one is working steadily with the other laborers there may be considerable time left during the year for making plans and studying methods for improving the organization.

12. *Managerial capacity of operator.* — The managerial capacity of the operator is of great importance in determining the

economical size of the farm. Some men can operate successfully a farm of 500 acres in less time than others would require to make a failure of a much smaller enterprise. In any case, for a particular farmer it is important that the farm be not so small as to make inadequate use of the time the operator can devote to supervision nor so large that it is beyond the capacity of the operator to supervise it efficiently. This depends to a large degree on the complexity of the business. A truck farm of 50 acres might be much more difficult to manage efficiently than a wheat farm of 500 acres.

It may be said, then, that the amount of time the farmer can devote to supervision is an important consideration in determining the minimum size that would be economical, for the farm should be at least large enough to provide for a full employment of the labor which the farmer and his family wish to devote to the enterprise. The size of the farm which would make the most profitable use of all the time which the operator can devote to supervision may also be regarded as the maximum size for that particular operator, for, unless the operator can spare more time to devote to the farm business, a larger farm would be too big for efficient supervision. In short, the time the operator spends in supervision is an important influence in determining both the minimum and the maximum size. It does not follow, however, that the farm would be the most economical size from the standpoint of the most efficient use of the various factors of production.

VI. General tendencies with regard to the size of farms. — Many people imagine it would be a fine thing if farms could be made very small. Much nonsense has been written concerning "the little farm well tilled" and "three acres and liberty." It must be obvious that three acres could maintain a family only by being operated in the most intensive kinds of truck crops and small fruits. It is possible that with such crops as celery, lettuce, strawberries, or the keeping of bees,

one might make a good living on a very few acres, but such crops cannot be generally adopted simply because it takes but a small increase of acreage to glut the market. In 1919 the total acreage of vegetables reported on farms with a product of $500 or more per farm was only 1,475,274. This included practically all important vegetables except potatoes. This is an area no greater than is to be found in one or two counties of ordinary size. The total acreage of all farm crops in 1919 in the United States was 375,431,734 acres. The acreage in small fruits in 1919 was 249,084. The world needs large quantities of such products as cereals, meat, cotton, and wool. These products cannot be economically produced on small farms of a few acres. In fact, modern studies have seemed to indicate that even the average size of such farms in many regions is too small for efficiency.

VII. Relation of size of farms to national welfare. — There has been continued discussion between British economists and those of the Continent as to the relative advantages of large-scale farming as compared with small-scale, or peasant, farming from the standpoint of national welfare. Large-scale farming has tended to prevail in England, while small-scale farming has been most characteristic of the Continent.

It is obvious that the smaller the farms the larger the number of independent operators. If farms are large, the number of operators will be smaller. If very large, it will be necessary to rely on hired labor or on closely supervised tenants, as in the case of southern plantations.

It is doubtful if we can afford to sacrifice the efficiency of farming in order to have a large number of small farms. On the continent of Europe there is no doubt that peasant farms are frequently too small for maximum efficiency. There is not enough machinery, and too much work is done by laborious hand methods. Where efficiency is so greatly sacrificed, a low standard of living for the farm population is likely

to prevail. In France, Belgium, and other parts of Europe it has become necessary to develop special policies to prevent farms becoming too small.

On the other hand, the larger the scale of farming the greater the amount of capital that must be invested per farm, and therefore the more difficult it is to accumulate the necessary capital to become a farmer.

The disadvantages to society of very large-scale farms appear to be so great that even if they were justified by superior efficiency they would probably be undesirable from the standpoint of national welfare. Great extremes of poverty and wealth in the country and corresponding differences in social standing, the lack of independence on the part of a large proportion of the farm population, uncertainty of employment in the case of hired laborers who are dependent upon the large farmer for employment, and the absence of a vital community life are too likely to characterize the prevalence of large-scale farming.

Whatever our attitude toward the question of the size of farms in relation to national welfare, it must be recognized that it is not desirable that all farms be of the same size. Because of varied physical conditions, different industrial requirements, and great differences in experience and efficiency of farmers it will always be desirable to have a considerable variety in the sizes of farms. It would be unfortunate for the country if all farm enterprises were so small that men of larger capacity would not find adequate scope for their faculties as farmers.

QUESTIONS ON THE TEXT

1. Discuss the difficulties of comparing the size of farms on the basis of total acreage.
2. What is the census definition of a farm, and how does it affect the question of size of farms in plantation regions?

3. The Census of 1910 showed that 41.1 per cent of the farms in Mississippi ranged from 20 to 49 acres in size, while the next largest percentage was 20.3 for the group from 10 to 19 acres. Would it be safe to conclude that farms from 10 to 50 acres in size were in general most economical in that State?

4. Would it necessarily be true that for any individual farmer a farm within this range of size would be most economical?

5. State and illustrate the unit principle in determining the minimum size of the farm.

6. Discuss the extent to which the unit principle is influential in determining the minimum size of the farm in the case of each of the following factors: (*a*) land, (*b*) buildings, (*c*) man labor, (*d*) horse labor, (*e*) machinery.

7. Is it desirable to make the farm large enough so that full use is made of a crosscut saw? Of a binder? Of a tractor? Of the work stock?

8. The period of "peak" demand for horse labor on a certain farm requires the use of at least 6 horses. Would this necessitate making the farm large enough to make the fullest possible use of the horses at other periods of the year?

9. What is the influence of total overhead expense in determining the minimum size of the farm?

10. Show that the conditions which determine the minimum size of the farm do not necessarily determine the maximum size.

11. What is meant by the term a "family farm"? A "bonanza farm"?

12. What influence do diversity and intensity of cultivation exert in determining the economical size of farms? Why?

13. Why does a tendency to large-scale farming sometimes prevail in regions of cheap land?

14. How do you explain the prevalence of large-scale plantations in the cotton and sugar regions of the South?

15. Mention the principal advantages of large-scale farming; of small-scale farming.

16. What considerations should determine the proportions of the farmer's time that should be devoted to work on the farm and to management?

17. Is the size of the farm limited by the time of the farmer available for farm work or by the time available for management?

18. What is the relation between the farmer's ability as a manager and the size of farm he can successfully operate?

19. Would it be advantageous to the nation to develop a large number of peasant farms similar to those of Europe? Would it be desirable to encourage the development of exceedingly large farms?

SPECIAL PROBLEMS

1. What are the advantages and disadvantages of each of the following methods of measuring the size of farms: (*a*) total area; (*b*) crop area; (*c*) crop area plus crop area equivalent; (*d*) value of sales; (*e*) value of farm capital?

2. What is the prevailing size of farms in your community? What conditions appear to have determined the tendency toward this size?

3. Is the prevailing size the size that tends to be most economical under existing conditions?

4. Is the farm on which you are living of the most economical size? Why?

5. The student should estimate each of the following quantities for the farm on which he lives: (*a*) value of products raised last year; (*b*) value of products sold last year; (*c*) value of buildings; (*d*) number of head of work stock; (*e*) total months of man labor; (*f*) total value of machinery. Divide each quantity by total acres in the farm and also by the total crop acres. The results obtained by the different students should be compared. What conclusions seem to be indicated as to the relation of the size of the farm to efficiency in production and in the use of the various factors of production?

6. What changes have occurred in the average size of farms and the average improved acreage per farm since 1850? (Obtain data from Census for various decades or from the *Statistical Abstract* of the United States.)

7. What percentages of the farms were in the different size groups classified by area in 1920? Study the distribution for each important subdivision of the United States. What reasons can you give for the size tendency indicated in each section?

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CHAPTER IX

SELECTION OF FARM ENTERPRISES

I. Diversified *versus* specialized farming
   1. Alleged advantages of diversification as compared with specialization in farming systems
      a. Maintains soil fertility
      b. Reduces risk
      c. Makes possible more uniform use of the factors of production throughout the year: man labor, horse labor, land, and machinery
      d. Better utilization of waste products
      e. More regular money income throughout the year
      f. Makes possible advantageous crop rotations

II. Advantages of farming based on a single source of income
   1. Sometimes there is a single enterprise that is more profitable for the region than any other farm enterprise
   2. A simple system of farming often has some of the advantages that are obtained by an increase in the size of farms
   3. A simple system of farming can be more easily reduced to routine
   4. Manager can concentrate his study on one enterprise

III. Nature of the problem of selecting farm enterprises
   1. Competition of enterprises for
      a. Land
      b. Man labor and horse labor
      c. Machinery
      d. Available financial capital
   2. Complementary enterprises
   3. Supplementary enterprises
   4. Some ways in which different enterprises are supplementary

5. The range of selection largely limited by the natural conditions and marketing facilities of the locality

IV. Profitableness of the enterprise as a basis of selection

1. The net profits from the enterprise considered alone

One of the most important elements of success in farming is the proper selection of farm enterprises and the proper relation of the several enterprises to one another in the farm business.

I. Diversified *versus* specialized farming. — There is much misapprehension and false generalization through the improper appreciation of the meaning of the terms *diversified farming* and *specialized farming*.

In order to avoid confusion we shall need to employ four terms which may be defined as follows: *When a system of farming comprises a single product and only one main source of income, we shall speak of it as specialized farming.* An example of this system of farming is production of citrus fruit in California. *When there is one main source of money receipts but a number of subsidiary products which are not produced for sale but contribute to the production of the main source of receipts, we shall call the system semispecialized farming.* Thus in dairy farming the principal source of money receipts is the milk, but corn, oats, hay, and other products are raised as feed. Similarly, in the Cotton Belt cotton is the source of money income, but corn is raised for feed, and sweet potatoes and other crops for home use.

When the system of farming is characterized by several products each of which is an important source of money income, we shall speak of it as diversified; but when there are a number of minor sources of income and one principal money crop, we shall designate the system as semidiversified.

There has been a tendency to regard diversified farming as fulfilling the various conditions that govern the proper choice of enterprises better than does specialized farming. Frequently,

however, undue emphasis has been placed on the importance of diversification on account of the vague use of the term.

1. *Alleged advantages of diversification as compared with specialization in farming systems.* — The most important advantages of diversification that have been suggested are the following:

a. Maintains soil fertility

b. Reduces risk

c. Makes possible more uniform use of the factors of production throughout the year — man labor, horse labor, land, and machinery

d. Better utilization of waste products

e. A more regular money income through the year

f. Makes possible crop rotation, which may tend to preserve soil fertility

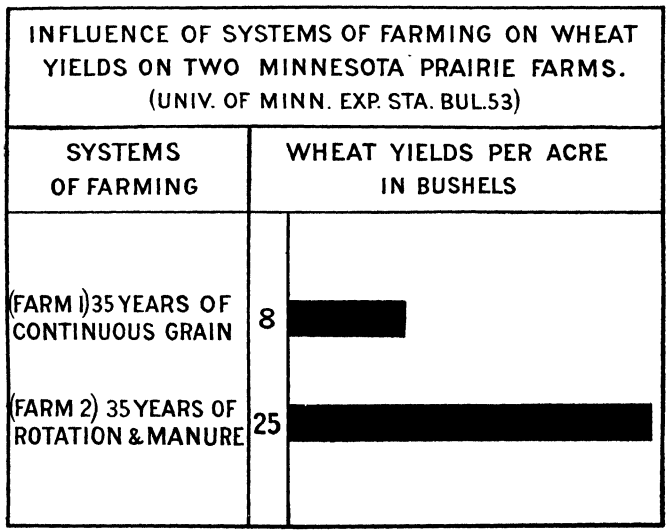
Let us consider each of these points separately:

a. Maintenance of soil fertility. — The idea that diversified farming results in the maintenance of soil fertility rests on the supposition that it involves rotation of crops and also the keeping of live stock. This is not necessarily the case. A farm may comprise production of a number of crops without the keeping of much live stock. For instance, in the wheat region of the Northwest, the farm area is frequently devoted to the production of several kinds of grain with comparatively little live stock. Even if live stock is kept, unless manure is applied to the fields, the soil fertility will not be maintained. Moreover, it is entirely possible that a number of crops may be raised without being rotated, and even if rotated all of the crops may be exhausting in their effect on the soil.

On the other hand, semispecialized farming, though involving only one source of money receipts, may involve the keeping up of soil fertility. For instance, milk may be the only product sold, but milk production may involve a cropping system including legumes and other crops beneficial to soil, as well as returning manure to the fields.

Even what we have defined above as specialized farming involving only a single enterprise, may also be consistent with the maintenance of soil fertility, as is the case in herding.

The above points are made not with a view of arguing that semispecialized or specialized farming is always more desirable



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FIG. 23. — EFFECT OF ROTATION AND MANURE ON WHEAT YIELDS

than diversified farming but merely in order to promote clearness of thought.

b. The idea that diversified farming reduces risk is based on the argument that there is a greater degree of risk to the farmer when his income is from a single enterprise than when it is derived from several, partly because the fluctuations in prices of the products of several different enterprises may tend to offset each other and partly because the variations in crop produc-

tion may tend to balance each other. It should be recognized that the former advantage may result from diversified farming as defined above but not necessarily from semispecialized farming, sometimes called diversified farming. Even in true diversified farming it must be recognized that when the price of one product falls, the prices of other products are likely to be influenced in a similar way. Moreover, weather and seasonal changes affecting one product unfavorably may likewise affect unfavorably other products.

In spite of these facts, however, there is a great advantage in not having all of one's eggs in the same basket, and safety in farming is generally increased by relying on several enterprises as sources of income.

c. More uniform and complete use of the factors of production. — A single enterprise is likely to make unequal demands of one or more of the factors of production during the various seasons of the year. To some extent it is possible to select enterprises that will fit together in such a manner that the factors of production will be more completely and uniformly employed throughout the year than would be possible with a single enterprise. This problem will be more fully considered in a later portion of this chapter. For the present it is merely important to note that this advantage may be enjoyed in semispecialized farming as well as in diversified farming.

d. More complete use of waste products. — There are frequently certain by-products of the major crop or crops which cannot be marketed unless fed to live stock — as, for instance, straw, stubble pasture, and spoiled grain. The advantage of using these waste products may also be characteristic of semispecialized farming if some kind of live stock or live-stock product is the principal source of money income.

e. More regular money income throughout the year. — It has been pointed out that specialized farming suffers from the disadvantage that all of the product is likely to be sold at one

time and therefore that the farm receipts come in all at once, a condition which is not only unfavorable to thrift but compels the farmer to borrow for a longer period of time than the banks are usually willing to lend money. This may also be true of so-called diversified farming if all the crops are harvested and sold at the same time of year, as, for instance, when the crops consist of oats, barley, and flax. On the other hand, it is not necessarily true of some forms of semispecialized farming, such as dairying, in which the receipts may come in during each month of the year.

f. The argument that diversification makes possible advantageous crop rotation. — It should be recognized that what we have called semispecialized farming, as well as so-called diversified farming, may involve crop rotation, but as pointed out above, it is possible to have a number of enterprises without having rotation and also to have a rotation which is of no material benefit in maintaining soil fertility.

II. Advantages of farming based on a single source of income. — Keeping in mind the fact that most of the above advantages may be realized under semispecialized farming, let us consider what additional advantages are derived from building up the system of farming about a single source of income, whether under specialized farming or semispecialized farming, as defined above.

1. *Sometimes there is a single enterprise that is more profitable for the region than any other farm enterprise.* This is true of cotton in many portions of the Cotton Belt. The reason for this is that the area in the world suitable for cotton is limited. The price of cotton, therefore, tends to be high enough to justify its production in the area where natural conditions are most favorable to its production, to the exclusion of other crops that might otherwise occupy the area.

Whenever a single product has an outstanding advantage over all other possible products in a given region, the system of

marketing and credit and the labor system and farm organization are likely to be especially developed to meet the requirements of this particular product, with the result that it is very difficult for the farmers to break away from the exclusive or nearly exclusive devotion to this product even in years when price conditions make it less profitable than some other possible farm enterprise.

2. *A simple system of farming often has some of the advantages which are obtained by an increase in the size of farms.* For instance, larger fields and more adequate equipment and sometimes a more complete use of that equipment can be achieved better under a single system of farming than under a diversified system. If the entire farm is devoted to a single crop, the area in that crop will be larger than under diversified farming, and the fields may therefore be larger for farms of the same size. If machinery and implements are employed for a single enterprise to which the entire farm is devoted, it will pay to purchase implements that could not be afforded if a farm of the same size were divided up among a number of enterprises, each of which required certain specialized implements. For the same reason it is possible that some of the specialized implements may be more continuously used than would be the case under diversified farming.

3. *A simple system of farming can be more easily reducible to routine.* As already pointed out (see Chapter VIII), large-scale farming is dependent on the possibility of reducing farming as nearly as possible to routine. Since routine is more nearly possible in a simple farming system, specialized farming makes possible such advantages as are inherent in large-scale production.

4. *Specialized farming has the advantage of enabling the manager to concentrate his study on one enterprise rather than on a large number of enterprises.* This must be of great importance at a time when farming is becoming exceedingly complex and when it is difficult for any one man to be fully acquainted with

all the scientific literature and with the scientific methods involved in the successful management of many enterprises.

In short, we should not assume that any one of the four kinds of farming defined above — whether diversified, semidiversified, specialized, or semispecialized — is always and everywhere most advantageous. We should leave our minds free to adopt the kind of farming most suited to existing conditions.

III. Nature of the problem of selecting farm enterprises. — The selection of farm enterprises would be a much simpler problem if it were not for the fact that some enterprises are mutually exclusive because they compete for one or more of the factors of production. The consequence is that to select one of two or more competing enterprises means that to some degree we thereby limit the extent to which a farm with given resources of land, labor, and capital may engage in the other competing enterprises. It is important to make clear the nature of this competition of enterprises and to indicate more in detail how it affects the problem of selection.

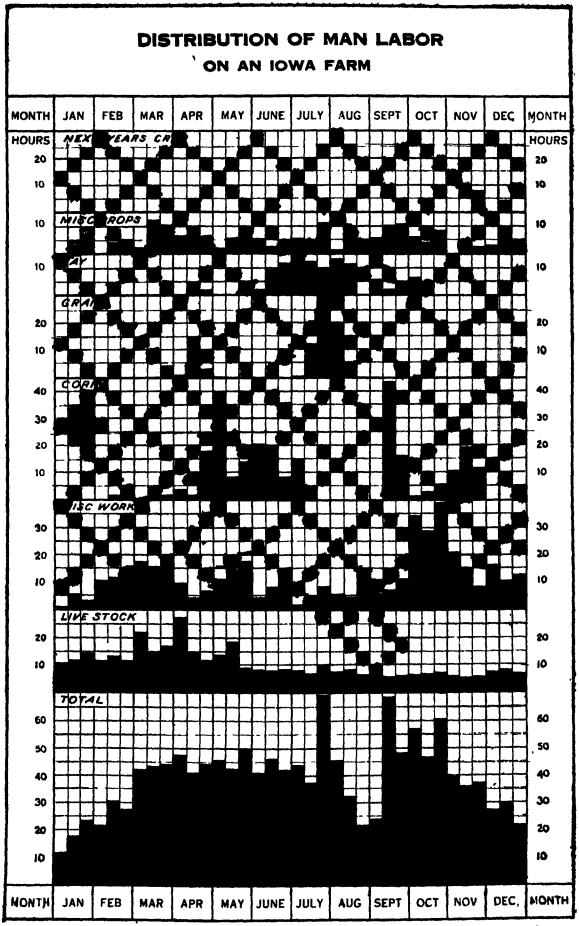
1. *Competition of enterprises.* — It is sometimes assumed that various farm enterprises are competitive only for labor (man labor and horse labor). In reality, however, there may be competition for the other factors.

a. Competition for land. — Some crops compete for land. This is true of crops grown in the same season. Such competition is not partial but complete. For instance, one cannot grow cotton and corn on the same land at the same time. Some crops are partly competitive for land if they are to be planted on the same field in the same year, but by combining them in a rotation system the land may be more fully employed — for instance, spring planted and fall planted crops. Few crops occupy the land the entire year. One may economize the land by combining in rotation crops planted and harvested at different times. Some crops are spring planted and harvested in midsummer or fall — for instance, corn, spring wheat, and

oats; some are fall planted and harvested in spring or early summer — for instance, winter wheat, rye, and crimson clover; some may be planted in midsummer — for instance, cowpeas, millet, and other forage crops; some may be sown in the midst of a crop and may make partial growth before the first crop is harvested — for instance, clover and cowpeas in corn. In the case of truck growing it is frequently the practice to start a new crop in between the rows of a crop not yet harvested. This is known as *intercropping*.

b. Competition for man labor and horse labor. — Some enterprises require the application of man or horse labor at the same period of the year. This competition may be extremely serious if the peak demand for both crops comes at the same time; less serious if the peak demand for one crop comes at a time when there is some need but not a maximum demand for labor on other crops; and still less serious if the peak demand for one crop comes at a time when no labor is required for the other. However, it is not only the correspondence of peak demand for one crop with peak demand for another crop that represents serious competition of enterprises, for the peak demand may continue for only a short period and may therefore be provided for by the temporary employment of extra labor. It is the general coincidence of labor demands that constitutes the most serious problem of competition for man and horse labor.

c. Competition for machinery. — The competition of different farm enterprises for the use of machinery and implements is somewhat less important than the other forms of competition, partly because two or more enterprises may not require the same kind of machinery at the same time, partly because the competition may be for inexpensive kinds of machinery or implements which may easily be duplicated without serious loss. In the case of motive power equipment, such as tractors, the problem is likely to become similar to that of the competition for horse labor except that it may be even more serious because



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FIG. 24. — DISTRIBUTION OF MAN LABOR

An illustration of how various farm enterprises may be competitive for man labor at certain times of the year while other enterprises are complementary. Black bars indicate average hours per day for each 10-day period.

the tractor is indivisible and involves a heavy investment, while its equivalent tractive power in the form of horses may be employed in various team combinations.

d. Competition for available financial capital. — Even those enterprises which are not competitive in any of the ways just described may still compete for some of the limited capital which the farmer has available for investment. On account of this competition for investment in capital, farmers frequently devote their entire energies to a single enterprise even though other noncompetitive enterprises are available.

2. *Complementary enterprises. — Enterprises which do not compete seriously are known as complementary.* Generally this term has been employed for those enterprises which are not seriously competitive as to man labor and horse labor. As a matter of fact, it should be clear that the difference between competitive and complementary crops is a difference of degree, for enterprises may be more or less competitive and therefore less or more complementary.

3. *Supplementary enterprises. — Enterprises are supplementary when the production of one is an aid to or contributes to the production of the other.* Some enterprises may be competitive in certain respects and yet supplementary to such an extent that one is justified in selecting both. Thus summer dairying conflicts to a certain extent with the production of some of the crops that are needed for the feed of dairy cattle and is therefore not complementary so far as concerns these crops, yet, in spite of this competition, the dairying and the crops may be carried on because of the supplementary relationship.

4. *Some ways in which different enterprises are supplementary.*

a. There is an interdependence of feed crops and live-stock enterprises, as follows:

(1) Live stock may be the cheapest way of marketing bulky products — especially of marketing products which could not otherwise be sold, such as roughage and spoiled grain.

(2) If live stock or live-stock products constitute the main enterprise, a crop may be raised because it tends to balance the feeding ration even though it might not be profitable alone if produced for the market.

(3) Live stock contribute manure to crop production, the purchase of which would be unprofitable if it had to be transported from a distance to the farm.

(4) One kind of live stock may be kept to consume what other kinds of live stock waste or fail to use.

b. Crops, which would not be profitable if produced out of rotation, are supplementary in various ways when raised in a rotation, as follows:

(1) Tilled crops supplement grain crops by clearing out the weeds which accumulate when small grain is raised year after year on the same land.

(2) Grain crops serve as nurse crops for grass crops.

(3) When certain crops follow each other in rotation, there may be an economy in labor as compared with the labor cost of the same crops when not planted in rotation. Thus sowing winter wheat after potatoes and beans with grass sown in the wheat saves a great deal of labor in the preparation of the land for the wheat, since the plowing and cultivation of the potatoes and beans puts the land in good shape for sowing wheat with comparatively little additional preparation. Likewise, the sowing of the grass with the wheat involves no extra preparation of the soil. The sowing of oats on corn land involves economy in labor in preparation of the land for the oats.

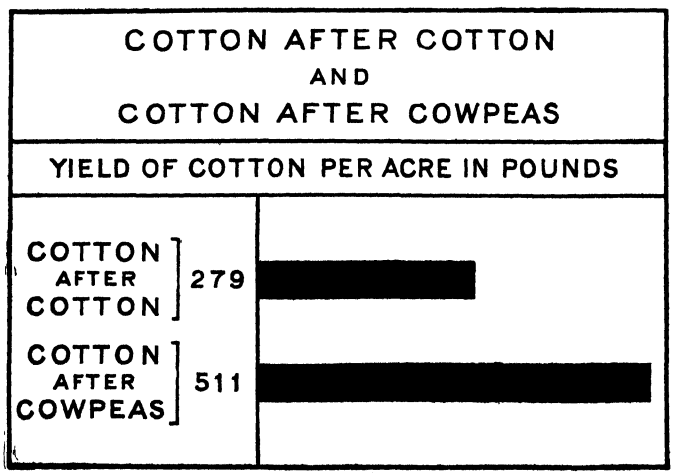
(4) Grass crops and legumes tend to fertilize the ground and keep up the supply of humus needed for other crops in the rotation. Also, cover crops, especially those planted in the fall of the year, such as crimson clover or rye, prevent land from washing and keep it in better condition for planting and cultivation of other crops in the spring and summer.

(5) Sometimes raising crops in a rotation reduces the tend-

ency to insect and plant diseases that might develop if one crop were continuously raised on the same land year after year.

(6) The production of several crops in rotation makes possible the alternating of deep and shallow rooted crops so that fertility may be drawn from different depths of the soil.

(7) The raising of several different crops in rotation may provide for the balanced removal of plant food, for the demands



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FIG. 25. — EFFECT OF COWPEAS ON COTTON YIELD.
In each case 336 pounds of fertilizer was applied to the crop.

for certain elements of fertility of one crop may not be the same as for another crop.

c. Complementary crops are also likely to be supplementary because they make possible a fuller and therefore a more economical use of the factors of production. Sometimes this is due to the fact that the enterprise provides a means of using the labor of women and children which would not otherwise be a

source of money income. For instance, there are indications that this is one important reason why dairying continues to be the principal basis of farming in certain sections, even though it is apparently unprofitable when all of the labor involved is charged at its market rates of wages.[1]

d. Sometimes an enterprise may be carried on as a means of using more fully land already devoted to another enterprise, as, for instance, planting crops in young orchards, particularly crops that tend to keep the land cultivated to the benefit of the growing trees.

e. Certain enterprises may be employed as a temporary means of using land in the process of being cleared, as, for instance, the sowing of clover among the stumps in the northern parts of Wisconsin, Minnesota, and Michigan, or the planting of corn in the midst of stumps, practiced by the American pioneers. In some cases farm enterprises may be carried on for the purpose of aiding in the clearing of land. For instance, goats and sheep have been found useful in removing the brush from land that is being cleared for use.

5. *The range of selection largely limited by the natural conditions and marketing facilities of the locality.* — So far as the major farm enterprises are concerned, the farmer may be limited to a comparatively small range of choice. Sometimes the physical conditions may be favorable to a crop, as, for instance, to fruit, poultry, or truck products, but the market is not favorable because it is already oversupplied or because the community does not possess the proper facilities for the economical shipment and marketing of these products. Sometimes an enterprise may be economically produced for home consumption in the local market, although it could not profitably be produced for a distant market.

[1] See, for instance, "Cost of Producing Milk on 174 Farms in Delaware County, N. Y." by A. L. Thompson, *Bulletin 364*, Agricultural Experiment Station of the New York College of Agriculture.

IV. Profitableness of the enterprise as a basis of selection. — 1. *The net profits from the enterprise considered alone.* — One of the most important considerations in favor of selecting a particular enterprise is the amount of net profit that may be expected from it on the basis of average production and the prevailing level of prices and expenses of production. However, there are certain exceptions to this principle.

a. An enterprise that is not the most profitable in money terms when considered as a single enterprise may contribute so much to other enterprises because of its supplementary character that it is wise to include it in the selection of farm enterprises. Some enterprises produce by-products which have no distinct sale value but which contribute indirectly to the productiveness of other enterprises. For instance, in a dairy region quite distant from large cities the market value of manure on the farm may be practically nothing, yet this manure may be a vital element making possible the production of crops which contribute to the profitableness of the farm business. Similarly, part of the gain from the grass crop is the addition to soil fertility. It would be difficult to determine the market value of this and to credit it to the grass crop itself.

b. Sometimes two enterprises are subject to joint costs. (For definition see Chapter VII.) The connection between the two enterprises may be so close that one cannot be produced without the other. For instance, in the production of mutton and wool it is impossible to produce the one without the other. Sometimes the costs of two enterprises are joint not because they cannot be raised separately but because when raised together they supplement one another by economizing expenses. The division of these joint costs between two products may be such that one or even both may be produced for less than if they were produced separately.

Frequently, in cost accounting investigations grain and hay raised on the farm are charged to live stock or to live-stock

products, such as milk, at what the grain and hay would be worth on the market at the time of harvest. Such a method may at times make the live stock and live-stock products appear to be an unprofitable enterprise when in reality they may be important links in the complete chain of the business. (For further discussion see Chapter VII.)

While pasture is sometimes charged at a fixed rental prevailing in the community and sometimes at the equivalent physical value to other feeds, it should be remembered that such a method of charging pasture to live stock or live-stock products may tend to exaggerate unduly the cost of those products, for, if there is no other use for pasture in the community, then the pasture must take what it can get in the way of economic return.

QUESTIONS ON THE TEXT

1. Define each of the following terms: specialized farming, semispecialized farming, diversified farming, semidiversified farming.
2. Give an example (from your own neighborhood, if possible) of a farm belonging to each of the above classes.
3. Make a list of advantages supposed to be characteristic of diversified farming.
4. Are all of these advantages characteristic of diversified farming? Explain.
5. Which of the above advantages may also be derived from a system of semispecialized farming?
6. Mention the possible advantages in specialized farming.
7. Give illustrations (from your own neighborhood, if possible) of crop or live-stock enterprises that compete (*a*) for land; (*b*) for man labor; (*c*) for horse labor; (*d*) for machinery.
8. Distinguish between competitive and supplementary enterprises.
9. May competitive enterprises be also supplementary? Illustrate.
10. Mention as many ways as you can in which farm enterprises may be supplementary.
11. Which of these involve rotation of crops?

SPECIAL PROBLEMS

1. The cost of producing hay on a certain farm is $11 per ton. The cost of shipping to the market (300 miles away) is $3.00 per ton. How

much would the farmer lose by producing for market at $12 a ton? How much would he save by producing his own hay rather than buying it? State the principle involved

2. Suppose a farmer could produce cheaper than he could buy every one of the different kinds of food which he uses. Does this prove that he should produce all of them for home use rather than buy some of them? Why?

3. Let us suppose the costs of growing oats and corn on separate tracts of land are 30 cents and 65 cents a bushel respectively. Let us also suppose that if the oats are grown after the corn on the same land the cost of plowing for the oats amounting, say, to 12 cents a bushel is saved. If the corn could be sold for only 60 cents a bushel, what would be the lowest price at which the oats could be sold so that the total receipts would equal the cost of both crops? State the principle involved.

4. A certain farmer maintains farm work horses which cost him $600 per year and which average 100 working days a year, making an average cost of $6 per day. The farmer finds that by adding winter dairying to his other enterprises he increases the total number of working days for his teams by 50. The total additional cost other than for the use of horses is $800 and the receipts $900. Charging the dairy enterprise with $\frac{1}{3}$ of the cost of the horses would result in a loss from dairying of $100 per year. Show that nevertheless the dairying adds to the farmer's total profits.

5. Suppose that a farmer can make $3.00 a day for his time in raising corn and only $2.00 a day raising cotton, but the corn keeps him employed for 120 days a year, while the cotton keeps him employed for 210 days. If the remainder of his 300 working days can be employed only at $1.25 a day, which crop will it pay him to produce?

6. What are the principal farm enterprises in the system of farming prevailing in your community. In what respects could there be improvement in the selection of enterprises? Explain fully.

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CHAPTER X

PROPORTIONS OF THE FACTORS OF PRODUCTION

I. Law of increasing and diminishing productivity
II. How do we know the law of diminishing productivity to be true
III. Conditions which determine the economical proportions of the factors of production
IV. How to measure the profitableness of varying proportions of the factors of production
V. Relation of the quality of the factors of production to their profitable combination

Why don't farmers pick out an acre of the best land on the farm and raise the entire crop on the one acre? Why can't they use all of their labor on one acre? Should farmers strive to obtain the largest possible product per acre or the largest possible amount per unit of labor employed, or is there some other principle by which they should measure success? The purpose of the present chapter is to consider these and similar questions.

The problem raised by these questions is the problem of proportions. In farm management, as in other kinds of business, it is important that the various factors of production shall be associated in the most economical proportions.

I. Law of increasing and diminishing productivity. — One of the most important aspects of the problem of proportions is expressed in the law of increasing and diminishing productivity.[1]

[1] Economists will recognize that in economic literature what is here called *diminishing productivity* has sometimes been called *diminishing returns*. The present writer employs the term *productivity* to distinguish the variation in return due to combining various factors of production in

The law may be stated as follows: *As increasing quantities of one factor of production are added to a fixed quantity of the other factors, there may be for a time an increase in the return per added unit of the variable factor until a maximum is reached after which the return per added unit of the variable factor is likely to decline.*

Let us first illustrate the principle mathematically for the purpose of precision and then afterwards consider its application under actual farm conditions.

Suppose we assume that a certain amount of land on a farm has been assigned to the production of a crop — say, wheat. Suppose also that for this purpose there are available the machinery and implements commonly employed in that neighborhood for farms of this size and for the particular kind of crop under consideration. We propose to consider the effect of different quantities of labor combined with these fixed quantities of the other factors on the resulting product per unit of labor. For the sake of simplicity we may assume that the units of labor are equal in amount, each representing, say, one day of labor. In Figure 26 the product of each additional unit of labor applied to the same amount of land and machinery is represented by the successive rectangles *a*, *b*, *c*, etc. The number of pounds of wheat added to the total product by each unit is shown at the top of the corresponding rectangle. The total product for any number of units is the sum of the figures at the top of the corresponding rectangles. Thus when a single unit of labor which we may designate *a* is employed, the total product is thirty pounds. When two units are employed, the second unit *b* adds sixty pounds to the thirty pounds that would be produced in employing only one unit.

different proportions from the variation due to the bringing into use of a factor or factors which are qualitatively different, as, for instance, the tendency to bring into use inferior land after the superior land has been occupied.

The total product is then ninety pounds, and the average product per unit is forty-five pounds.

It is assumed in the illustration that each additional unit of labor increases the total product by more than any additional unit of a smaller quantity of labor until six units of labor have been employed, the sixth unit *f* having added one hundred and seventy pounds to the total product.

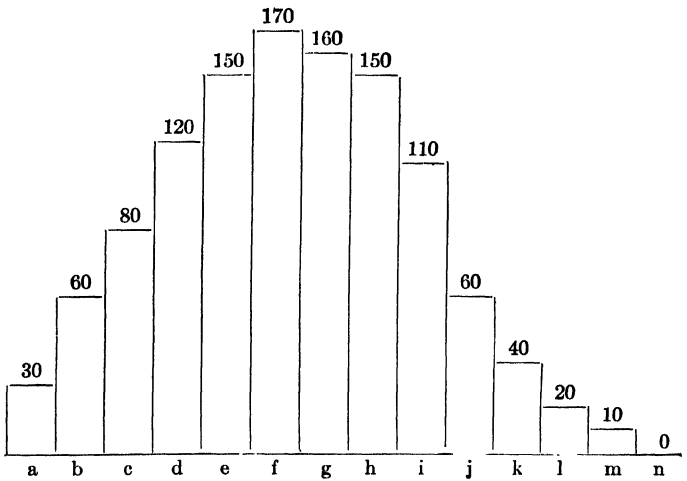


FIG. 26. — CHART ILLUSTRATING INCREASING AND DIMINISHING PRODUCTIVITY

If six units of labor are employed, the addition of another unit will add somewhat less than before until finally, when thirteen units are employed, the addition of another unit *n* will not increase the product by even a single pound of wheat.

It will be noted that up to the point where thirteen units of labor are used each additional unit, while adding somewhat less than a previous unit, has increased the total product. However, since the fourteenth unit *n* adds nothing to the total

product, it is probable that the addition of a fifteenth unit of labor *o* would add less than nothing — that is, would actually diminish the total product of fourteen units, the quantity of labor being actually excessive. It is rarely the case that so much of one factor is ever employed in connection with other factors as to reach the point where an additional amount of labor efficiently employed would actually prove a detriment to the crop.

It is obvious that one man may frequently employ ten days of labor with a given quantity of land and machinery so as to produce a larger crop than another man will produce with fourteen days of labor on the same land and with the same machinery. It should be clear, however, that this introduces in the above discussion another element; namely, a variation in the efficiency with which the labor is employed. Since we are studying the problem of the proper *quantitative* proportions in which the factors of production should be combined, it will be necessary to assume that there is no variation in skill or intelligence in the method of employing labor.

It will also be probable that, when we assume the employment of different quantities of labor, these different quantities may be used in different ways. Thus some of the units may be employed in cleaning up the field preparatory to plowing, others in supplying manure, still others in plowing, harrowing, seeding, cultivating, and so on. In the discussion of the effects of applying different quantities of labor to a fixed amount of land and machinery, it is assumed that any quantity of labor employed has been used for those processes that will contribute most to production; in other words, that the farmer to the best of his knowledge would use any given quantity of labor for the most important processes and that this labor would be distributed properly among these processes. If, however, we assume that the farmer has not been employing a given quantity of labor wisely and becomes aware of this fact through the advice of

the County Agent or the reading of a bulletin or in some other way, it is possible that he may be able to add an additional unit with an increased product per unit even though previous units had been added at a diminishing productivity, or even

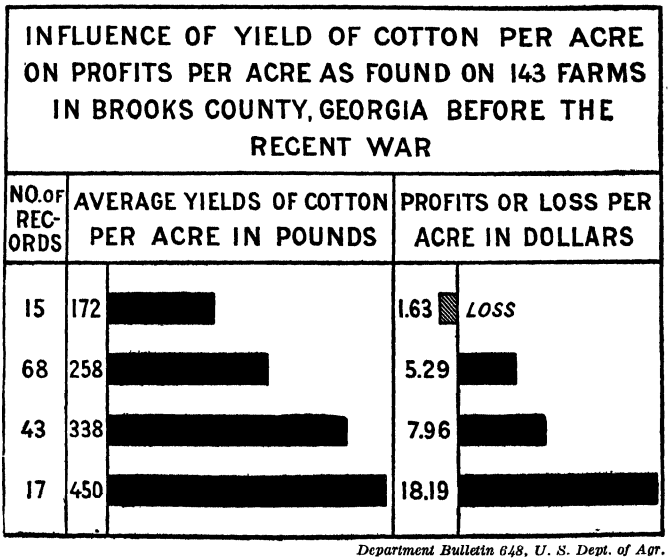


FIG. 27. — INFLUENCE OF YIELD OF COTTON PER ACRE ON PROFITS PER ACRE

Since profits are shown to have increased in greater proportion than the increase in yield, we may conclude that good management has succeeded in increasing the yield without encountering the law of decreasing productivity — that is, without increasing the cost in greater proportion than the increase of yield.

without increasing the quantity of labor he may make the average product per unit and therefore the total product larger than before. This might be accomplished, for instance, by a better selection of seed, by selecting a crop better suited to the type of soil or climate, etc. However, this increased product

per unit is not due to a quantitative change in the proportion of labor to the other factors of production but rather to a qualitative change in the methods of using the labor. Obviously, the question of adding a unit of labor will involve always the technical problem of how it should be used. It may be used for some process not formerly employed, as, for instance, in testing the seed; it may be used to increase the amount of some process, as in harrowing twice instead of once; or it may be used in changing the character of a process, as, plowing deeper, scattering the seed more carefully, etc.

II. How do we know the law of diminishing productivity to be true? — One's reason will support the conclusion that it would be possible to continue adding labor to a given amount of land until the laborers get in each other's way. It would be possible to add manure until the additional tons even reduce the crop through excess of nitrogen. If the law of diminishing productivity were not true, there would be no necessity for farmers to employ any great amount of land. They might as well continue to add labor on one acre.

TABLE 6. RESULTS OF APPLYING INCREASED QUANTITIES OF FERTILIZER OVER A PERIOD OF FIFTY-TWO YEARS IN WHEAT PRODUCTION

Fertilizer Applied	Average Total Product for Fifty-two Years (Bushels)	Increase per 100 Pounds of Added Fertilizer (Bushels)
None	14.8	
200 lbs.	23.9	4.55
400 lbs.	32.8	4.45
600 lbs.	37.1	2.15

In the second place, the law of diminishing productivity has been established by various scientific experiments. Among the most important of these are the experiments of Lawes and

Gilbert at the famous Rothamsted Experiment Station in England. The preceding table shows the results of continuous tests for fifty-two years in applying different quantities of fertilizer to a given amount of land in the production of wheat.[1]

III. Conditions which determine the economical proportions of the factors of production. — It is one thing to recognize that we might use too much of one factor with a given amount of the other factors so that there might even be less produced than would result from using a smaller proportion. It is quite another thing to determine what proportion is most profitable, for clearly it would usually be unprofitable to continue to increase the amount of labor used with a given amount of land and equipment until the last unit added nothing to the product, for if one had to pay anything at all for the added unit of labor it would not be profitable to use it when no return from it is to be expected. Sometimes, however, the idea of adding labor to a given amount of land until the last unit adds nothing to the product is put in a more plausible way in the statement that farmers should produce as much as possible per acre. Now if this means that they should employ their labor and equipment on the land as skillfully as possible it is something that every one could agree to; but if it means that labor should be applied to each acre so long as it would add to the total product of that acre it is clearly a mistaken principle unless the labor is of no value for other purposes, for if it had value for other purposes, one would not care to employ it where it adds nothing to the total return.

A similar error is involved in the assumption that we should combine the factors in such a proportion as to result in a *maximum average product per unit of labor*, for this would involve adding land (or other factors) to a given quantity of labor so

[1] Adapted from "Apportioning the Factors of Production," by E. Davenport, *Circular 177*, Illinois Experiment Station.

long as a given unit of land will add anything to the product, no matter how much each unit of land may cost. Such a policy may be desirable when the use of the land which one employs is obtainable free of rent or other cost but not when the use of the land must be paid for.

If the land and labor are both valuable, the profitable proportion must usually be between the two extremes which have been considered. The important question is what principle determines the actual proportion?

The preceding discussion has indicated that the value of the several factors of production has much to do with determining the most profitable proportion in which they should be combined. Broadly speaking, we may lay down the following general rule:

As the value of a given quantity of any one of the factors of production increases, it will generally be profitable to combine with it larger quantities of the other factors (assuming their values have not changed) than was profitable before the rise of value.

This is another way of saying that the tendency is to economize the factor which becomes more valuable as compared with the other factors by using less of the dearer factor in proportion to a given quantity of the other factors.

In part this may represent the actual substitution of one factor for another. For instance, it is possible to some extent to substitute machinery for man labor or for horse labor. A great increase in the cost of man labor and horse labor would make it relatively more economical to substitute tractors than before. Even when the change in the proportion of the factors does not take the form of actual substitution, the change may in reality be an indirect substitution of one factor for another. Let us suppose that the labor of two men on 100 acres will produce 1,200 bushels of wheat while the labor of three men will produce 1,600 bushels. This really amounts to the indirect substitution of labor for land, for to produce the same product

as before, 1,200 bushels, would require 75 acres and man labor amounting to the time of two and one quarter men. That is, we have produced the same crop as before by adding one fourth the time of a man in place of 25 acres, which is thereby saved. If the added labor costs less than the annual rent of 25 acres, the indirect substitution has resulted in a real economy.

In countries where land is high in price relatively to wages of labor there is a tendency to employ more labor in proportion to a given amount of land (that is, to operate the land more intensively) than is the case in countries where land is cheap and labor high. The former condition prevails on the continent of Europe while the latter condition has been characteristic of the United States. For instance, in Bavaria the acreage of the important crops per person engaged in agriculture was less than 18 in 1911, while it was nearly 60 for Iowa in 1920. If all the products of the different crops be reduced to an equivalent unit of food value (one pound of corn or wheat), it appears that Iowa exceeds Bavaria somewhat even in production per acre with 1,458 units per acre as compared with 1,191 units. When the comparison is made per man it is found that Iowa produced 86,777 food units per person engaged in agriculture as compared with only 21,231 units in Bavaria, or more than four times as much.[1]

The great inferiority of the Bavaria product per man is due in part to the law of diminishing productivity, but the inferiority in production per acre cannot be attributed wholly to this cause (assuming the lands of the two states are of equal fertility), for the larger amount of labor per acre in Bavaria should result in a somewhat larger return per acre than in Iowa. It is probable then that the great productive superiority of Iowa must be due to other causes, probably in large part to the greater employment of machinery.

[1] The statistics were compiled by Mr. E. A. Goldenweiser and are published in Carver's *Selected Readings in Rural Economics*, pp. 148–150.

It may appear that after all the comparison is unfair to Bavaria, for we have not considered the fact that while the expenditure for labor per acre in Iowa is much smaller the larger expenditure for machinery should also be considered. However, if we count the annual cost of using farm machinery at sixteen per cent of its value (that is, ten per cent for depreciation and repairs and six per cent for interest), the average annual cost of machinery per person engaged in agriculture for Iowa was only $45.92 in 1909. Even if we allow nothing for the machinery employed by the Bavarian farmers, this small sum could hardly be considered equal to the excess labor required in Bavaria to work a given amount of land or to produce a given product, for in Bavaria 3.3 men were required to work the same amount of land that was worked by one man in Iowa and more than four men in Bavaria to produce the same product as was produced by one man in Iowa.

The most extreme form of intensity of cultivation is found in densely-populated countries like India and China. This intensity is not so much a result of high land values and low relative wages, for in these countries agriculture is on the whole not commercial. The condition is rather due to the dense agricultural population and the resulting competition for land as a means of raising necessary food. It is estimated, for instance, that in India there is one agricultural laborer for every 1.3 acre of farm land and that in spite of this the product of each acre is less than in some of the more progressive countries, as England.[1]

While it is generally true that a marked increase in the value of land as compared with the value of the other factors of production in a given region and for a given type of agriculture will justify a more intensive kind of cultivation, yet it is not necessarily true that higher land values in one region than in

[1] "The Agricultural Development of India," by Nagundra Nath Sen Gupta, *The Asiatic Review*, Vol. XVI, pp. 395–413.

another region will result in more intensive cultivation. This point was explained in Chapter II.

Although the relative value of the several factors of production is an important condition in determining the most profitable proportion for the factors, we must recognize that so far as a particular farm is concerned there is likely to be one factor that is peculiarly limited and that this limitation tends to influence the proportion of the factors that would be most profitable for that farmer. Let us consider from this standpoint the main classes of productive factors — labor, land, improvements, equipment, time available for management, and money capital.

Labor is usually absolutely limited only in pioneer farming. In regions of commercial agriculture the farmer usually can obtain additional labor if he can afford to pay for it. Consequently, we shall hardly need to consider labor as the absolutely limiting factor in commercial agriculture.

From the standpoint of the individual farmer, land is probably never severely limited in amount. One can always obtain additional land if one can afford to rent or to buy it. In other words, as in the case of labor, it is largely a question of sufficient capital and of whether it is profitable to use additional land at the price one has to pay for it. This, of course, is a question of relative, rather than absolute, limitation. Broadly speaking, the same principles apply to improvements and equipment. They are never absolutely limited but only relatively limited — they may always be obtained if one can afford to buy them.

As far as the individual farmer is concerned, the time which he has available for managing the farm is likely to be severely limited. To be sure, if he is engaged in operating other businesses, he may find it profitable to transfer some of his time and attention to his farming business, but if he is devoting all of his time to the business of farming, his total profits will be limited by this amount of time and by how profitably he can employ

it. In other words, he will be concerned with making each hour count for the most toward profitableness, and his total profits will be determined by the profitableness per unit of time multiplied by the total number of units available. It may frequently be true, however, that a farmer does not have sufficient money capital to employ his total time available for management to best advantage. This is especially the case in newly-developed regions where money capital is scarce and where the farmer frequently finds that he could increase his profits if he had more capital. In older regions where the credit arrangements are better developed there is some connection between his managing ability and his ability to obtain capital. Bankers and other money lenders are likely to be quick to recognize managing ability and to supply capital necessary for employing it. However, even yet the credit arrangements for agriculture are so crude that much is to be desired in this connection. Consequently, even in old regions it is largely true that farmers' profits are not limited so much by the time available for managing the business as by capital available for carrying it on. Probably most farmers could increase their profits from farming if they could command more money capital.

IV. How to measure the profitableness of varying proportions of the factors of production. — Assuming that money capital available for purchasing land, labor, equipment, and other factors of production sets the limits on possible profits, we may accept the general principle *that the farmer should adopt that proportion of the factors which will yield a maximum return per dollar of total expenditure for any fiscal period, say, one year, rather than the maximum net return per unit of a single factor.*[1]

[1] Agricultural economists will recognize that this statement is essentially different from the two contrasting statements presented by T. N. Carver (*Principles of Rural Economics*, pp. 216–222) and H. C. Taylor (*Agricultural Economics*, Chapter XIII).

TABLE 7. EFFECTS OF VARYING THE QUANTITY OF LABOR EMPLOYED IN PRODUCING ONE ACRE OF POTATOES

(Potatoes at $1.60 per bushel)

Quantity of Labor	Total Product		Added Product		Average Gross Product per Week of Labor		Average Return per $1 of Expense		
	1	2	3	4	5	6	7	8	9
	Bushels	Value	Bushels	Value	Bushels	Value	Rent $10 Wages $8	Rent $30 Wages $8	Rent $10 Wages $4
		$		$		$	$	$	$
1 week	10	16.00	10	16.00	10	16.00	0.88	0.42+	1.14+
2 weeks	22½	36.00	12½	20.00	11¼	18.00	1.38+	0.78+	2.00
3 weeks	36	57.60	13½	21.60	12	19 20	1.69+	1.07−	2.62−
4 weeks	50	80.00	14	22.40	12½	20.00	1.90+	1.29+	3.08−
5 weeks	63	100.80	13	20.80	12⅗	20.16	2.02−	1.44	3.36
6 weeks	75	120.00	12	19.20	12½	20.00	2.07−	1.53	3.53−
7 weeks	85	136.00	10	16.00	12⅛	19.42+	2.06+	1.58+	3.58−
8 weeks	94	150.40	9	14.40	11¾	18.80	2.03+	1.60	3.58+
9 weeks	100	160.00	6	9.60	11⅑	17.77+	1.95+	1.57−	3.48−
10 weeks	105	168.00	5	8.00	10½	16.80	1.87−	1.53−	3.36
11 weeks	109	174.40	4	6.40	9 10/11	15.85+	1.78−	1.48−	3.23−
12 weeks	109	174.40	0	0.00	9 1/12	14.53+	1.65−	1.38+	3.00+

This principle is illustrated in Table 7. The table shows the results of employing different quantities of labor on an acre of land in the production of potatoes. The unit of labor assumed is the time of one man for a week. The figures are assumed at random, the only basis of selection being that there shall be for a time an increasing average return per unit of labor as the quantity of labor is increased and that thereafter the average return per unit of labor shall decrease. (See columns 5 and 6.)

If the use of the land could be obtained without the payment of rent, the only expense would be for labor (for the purpose of illustration only the two factors are at present considered). Hence it would pay to use that proportion of labor which would yield the largest average product per unit of labor — that is,

per dollar of expense. As shown by column 6, this would be obtained by employing only five weeks of labor on the acre.

If labor had no value (a very improbable assumption), it would pay to employ labor as long as each unit adds to the total product, for this would give the maximum return per acre. As shown by column 2, this would be obtained by employing either eleven or twelve weeks of labor. Since the only expense under the assumption would be for land, the maximum return per acre would also yield the largest return per dollar of expense for land.

It is generally the case that neither of the factors is free; therefore, the principle stated on page 152 applies — the most profitable proportion will depend on the ratio of the values of the factors. Let us suppose, for instance, that the rent of the land is $10 per year and the labor costs $8 per week. Under these conditions, as shown by column 7, it would pay to employ six weeks of labor on the land, for this would yield a return of $2.07 for each dollar expended on land and labor, or a net return of $1.07 for each dollar expended. If rent were higher, it would pay to work the land more intensively, that is, to use more labor per acre, for the maximum return per dollar of expense as shown by column 8 would result from employing eight weeks of labor. If rent remains unchanged but labor decreases in value, it will pay to work the land more intensively. Thus when rent is $10 and wages $4 per week, it pays to employ eight weeks of labor (column 9), whereas we have already seen that it pays to use only six weeks when wages are $8 and rent $10.

The student will have noted that we have been considering only two factors; we have assumed a given amount of land together with the necessary implements, seed, and other materials and have considered the effect of varying the amount of labor employed with this land and equipment. It will appear, however, that in actual practice a variation in the amount

of one factor may cause a variation at the same time in the ratio of the other factors. Assuming a fixed amount of land, say, one acre, we cannot assume that it would pay to use the same amount of machinery, seed, and other materials when we employ six weeks of labor that we would use if we employed eight weeks of labor. In other words, changing the amount of labor might change the ratio of equipment, seed, and fertilizer employed for an acre of land. The use of more labor might in part be a direct substitution for some of the other factors, say, machinery, so that as we increase the labor we use less machinery. Frequently, however, it may be the other way. For instance, when it pays to use a great deal of labor in proportion to land it may also pay to employ more fertilizer than would be profitable if less labor were employed. Thus it is generally profitable to employ a great deal more fertilizer in the case of truck crops where a great deal of labor is used per acre than would be profitable if one were engaged in a less intensive kind of farming, as wheat production. For instance, a survey made in Anderson County, South Carolina, showed the average value of fertilizer applied to cotton land to be $4.88 as compared with $3.84 on corn, $2.39 on oats and oat hay, and $1.94 on wheat.[1]

V. Relation of the quality of the factors of production to their profitable combination. — Thus far we have been considering the problem of the proper quantities of different factors to be used in combination for production. We have not considered the variations in quality and the principles that determine the selection of different qualities of factors for use in production. Seed, men, live stock, machinery, land, and buildings, all vary in quality.

It has been said that the factors of best quality should be

[1] "A Farm Management Study in Anderson County, South Carolina," by A. G. Smith, *Bulletin 651*, United States Department of Agriculture, p. 13, note.

combined with one another. For instance, if one has a high quality of land one should use high-quality labor; if one has high-quality dairy cows one should employ high-grade labor.[1]

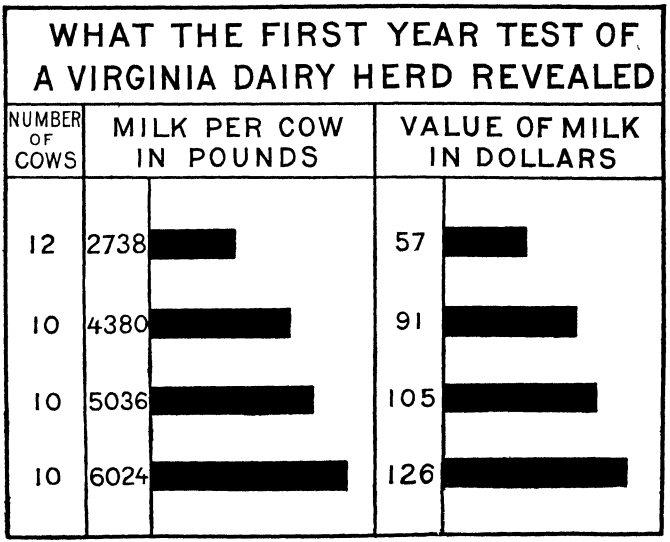
Let us consider this problem concretely. In the first place, we may ask whether we should use good seed with good land and poor seed with poor land. It is true, of course, that to use poor seed with high-quality land and labor does result in greater loss than to use it with poor-quality land and labor. However, there is no particular reason for employing poor seed at all, for it is not generally cheaper than good seed, and it is principally a question of knowing how to determine the quality.

Should good managers be used on good land and poor managers on poor land? In the long run it is probable that the values of land and labor will be so adjusted that good managers can afford to pay more for good land than poor managers could pay and still make larger profits than they could make on poor land. However, it is entirely possible that what makes land poor is lack of some element that would be supplied by proper management, and the good manager, knowing how to overcome the difficulty and being able to get the land relatively cheap because the inefficient managers do not know how to make it productive, can sometimes make a larger profit on the poor land than on the more valuable land. Similarly, good managers may sometimes be able to employ low-grade labor more effectively than poor managers can and, if the low-grade labor is comparatively cheap, may be able to make larger profits than they could make by employing the more efficient but higher-priced labor.

When one has a high quality of live stock, it is probable that it is usually economical to employ a higher quality of labor than one could afford to employ for poor quality of live stock. Generally it pays to put good improvements on good land rather

[1] See H. C. Taylor, *Agricultural Economics*, Chapter XII.

than on poor land. In all cases, however, the relative values of the high-grade and low-grade factors have to be considered. If the low-grade factor is valued relatively cheaper to its quality than the high-grade factor, it may frequently pay to employ it in association with other factors of high quality.



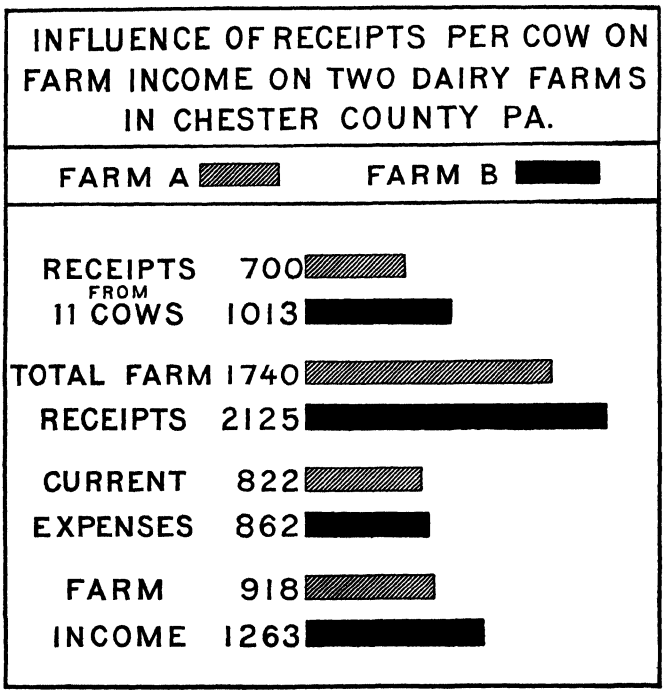
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FIG. 28. — IMPORTANCE OF TESTING DAIRY HERDS

Showing that the best 10 cows gave more than twice as much milk as did the poorest 12. This emphasizes the importance of testing the herd and eliminating poor producers.

It must be recognized also that there is a certain degree of interchangeability between quality and quantity of factors employed. Not infrequently quality is a substitute for quantity. This is especially the case where quality takes the form of a larger amount of accomplishment. For instance, a laborer who can plow two acres a day is much more than equivalent

to two men each of whom can plow one acre a day; for not only will he accomplish the same result as the two men but he will accomplish it with one team and plow rather than two.



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FIG. 29. — IMPORTANCE OF ELIMINATING POOR PRODUCERS

The results of eliminating the low-producing cows of the dairy herd are reflected to a marked degree in farm income.

Sometimes the high quality of one factor economizes the quantity required of another factor. For instance, good machinery is less likely to break than poor machinery and therefore will

require less labor for repairs and for delays incident to breakdowns than is necessary in the case of machinery of poor quality.

QUESTIONS ON THE TEXT

1. State the law of diminishing productivity.

2. "A farmer should produce the largest possible amount per acre." Criticize.

3. Certain surveys show that the cost of production varies inversely as the product per acre. Is this inconsistent with the principle of diminishing productivity?

4. "The farmer should so organize his business as to produce the largest possible return per unit of labor employed." Criticize.

5. If a large increase occurred in the value of land without a corresponding increase in the value of labor and equipment, would it likely be profitable for the farmer to use more or less labor and equipment per acre? Explain.

6. Is it necessarily true that in a section where land values are $200 an acre more labor and equipment will be employed per acre than in a section where the land value is $100 an acre? How do you reconcile your answer to this question with your answer to question 5?

7. If the value of labor increased in proportion to the value of land and equipment, would it be profitable for the farmer to use more or less labor per acre? Explain.

8. How do Bavaria and Iowa compare in product per man? In product per acre? Even though the product per acre in Bavaria were larger than in Iowa would it necessarily be desirable for Iowa farmers to increase their product per acre to that of Bavaria? Explain.

9. State the principle that should govern the farmer in determining the proportions of the factors of production.

10. Should high-grade or low-grade labor be used with high-grade land? With high-grade live stock? With high-grade machinery? Explain.

SPECIAL PROBLEMS

1. Admitting that a farmer should not employ that proportion of labor and land that would result in the largest product per acre of land, might it not be true that he should employ that proportion which will result in the largest net product per acre, the cost of production being deducted from the total product? Work out an answer to this question on the basis of the following: A farmer can employ forty days of man labor and eight days of horse labor in producing a crop of tobacco worth $600. He can employ two days of man labor and five days of horse labor per acre in producing corn worth $60. The farmer finds that he can operate 350 acres of

corn and only 30 acres of tobacco. Which crop would yield the larger profit if man labor is worth $3 a day and horse labor $2?

2. In the above problem, which crop could pay the higher rent for the land?

3. In problem 1, what other factor had to be considered besides the mere proportions of man labor, horse labor, and land?

4. Would there be a different answer to the above problem if man labor were worth $4 per day and horse labor $2 per day, other things being equal? What would be the answer if man labor were $1.50 per day and horse labor $1.00 per day?

5. Under the conditions of Table 7 how many weeks of labor per acre would you employ if you wished to have the largest gross product per acre? How many if you wanted to have the largest average return per unit of labor?

6. Under the conditions of Table 7 and assuming rent $10 an acre and wages $4 an acre, how many weeks of labor would you employ if you were seeking a maximum net return per acre? How many if you were striving for maximum net return per unit of land? How many if your aim were maximum return per dollar of expense?

7. Under the conditions of problem 6, how many weeks of labor per acre would give you the largest total profit on your farm if the size of the business were limited by the fact that you could get only 80 acres of land? If you could employ only a total of one hundred and twenty weeks of labor? If your capital were limited to $3,000 per year to be expended in paying the annual cost of land and labor?

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Note: Many bulletins on various aspects of farm organization contain concrete illustrations of the principles in this chapter.

CHAPTER XI

FARM MACHINERY

I. Significance of the introduction of farm machinery
II. Machinery costs
  1. Importance of machinery costs
  2. Elements of machinery costs
  3. Depreciation
  4. Relation of shelter to depreciation
  5. Interest
  6. Repair costs
  7. Duty of farm implements
III. How to determine the economy of various farm processes with horse power
  1. The problem of economy in plowing
  2. Harrowing
  3. Planting
  4. Spreading manure
  5. Cultivating
  6. Harvesting grain with a binder
  7. Harvesting with the header and combine

I. Significance of the introduction of farm machinery. — Broadly speaking, the year 1850 may be regarded as the close of the period of agriculture carried on largely by hand tools and the beginning of the machinery stage of agriculture.

The rapid introduction of farm machinery in the United States may be attributed to the fact that the abundance of land and scarcity of labor made it economical to substitute machinery for labor. In general, therefore, the introduction

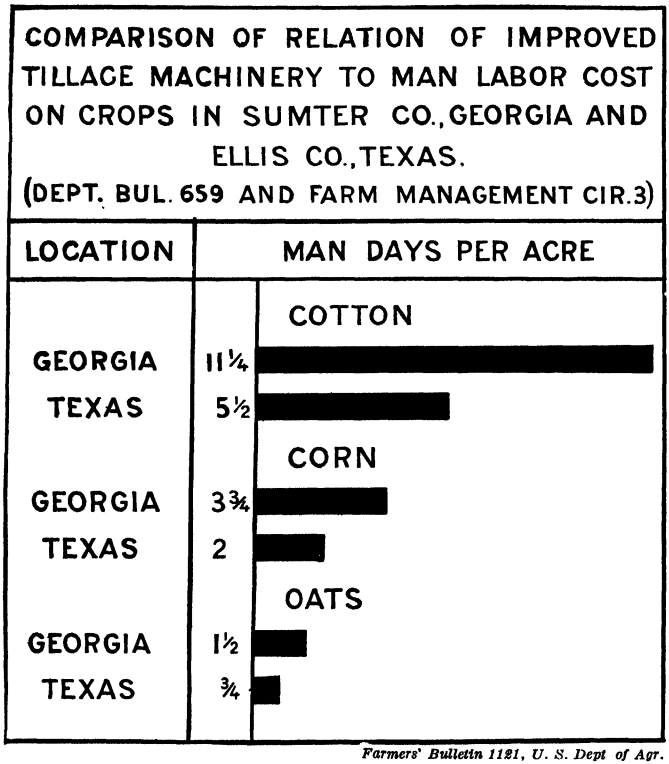


FIG. 30

Man days per acre lower by half through use of improved machines and big teams in Texas as compared with Georgia.

of machinery has tended to increase the amount of land a man can operate and the amount of production per man rather than to increase the product per acre. A rough estimate indicates that by use of machinery resulting from various inventions between 1829 and 1870 production was four or five times as great

as would have been possible with the same labor without the use of machinery.[1]

The economy, of course, appears greater than it really is. For from the farmer's standpoint the saving of labor by the use of machinery is offset to some extent by the expense of the machinery and of the power required to operate it. From the social standpoint there has been a change in the kind of labor, that is, some of the labor required formerly for farming is now employed in making machines for farming. The writer from whom the above figures were derived estimates a saving in money cost amounting to at least fifty per cent in the last half of the nineteenth century.[2]

However, this does not make allowance for changes in the value of the dollar. Recent investigations in the cost of harvesting wheat indicate that if we assume the same rate of wages in 1918 as in 1850 the cost of harvesting wheat by machine methods was about $1.23 in 1918 as compared with $1.60 by hand methods in 1850 and this in spite of the fact that two men with three or four horses will cut, bind, and shock about eight times as much as two men cutting with a cradle and binding by hand.[3]

II. Machinery Costs. — 1. *Importance of machinery costs.* — It is sometimes considered that machine costs are small items in the total cost of production. In Minnesota it was found that the average expense for machinery (1913–1917), not including the special charges for threshing machines, ranged for the various crops from 8.1 per cent to 10.3 per cent of the to-

[1] Based on a table in "The Influence of Farm Machinery on Production and Labor," by H. W. Quaintance, p. 23. The data in the table are derived from investigations by the United States Department of Labor and published in the 13th *Annual Report*. The year is not the same for all the crops because of the importance of choosing a normal crop year.

[2] *Ibid.*, p. 27.

[3] "Cost of Harvesting Wheat by Different Methods," by Arnold P. Yerkes, *Bulletin 627*, United States Department of Agriculture, pp. 11–12.

tal costs per acre.[1] When we consider particular processes of farming, estimates show that the variation of machinery costs is greater, ranging from 4.7 per cent of total cost in the case of plowing to 52.7 per cent of total cost in the harvesting of small grain.[2]

2. *Elements of machinery cost.* — If we could hire the use of a machine for each job, it would be easier to determine what the machine cost is, but we buy a machine which does not wear out for a number of years and which is used many times during the year, sometimes for different crops or for different processes in crop production.

The first task in determining machinery costs is to find out the annual cost of owning the machine. These annual costs include depreciation, interest on the investment in machinery, taxes (usually a minor item), and repairs.

To a large extent, particularly in the case of certain machines, these costs do not vary greatly according to the amount of use made of the machine. It is true, a machine may depreciate somewhat more rapidly if frequently used than if only slightly used, but many machines deteriorate even when not in use, especially if not properly protected against the weather. Moreover, machines are constantly getting out-of-date because new and better kinds of machines are being invented and put on the market. Interest on the investment, of course, has no relationship to the amount of use made. Repairs vary somewhat more in accordance with amount of use than does depreciation but by no means in proportion to the amount of use made. For instance, in the case of walking plows an increase in the average area covered by the plow from 16 to 48 acres resulted in an increase from eight per cent to only twelve per cent in average

[1] "The Cost of Producing Minnesota Field Crops, 1913–1917," by F. W. Peck, Minnesota Agricultural Experiment Station *Bulletin 179*, p. 22.

[2] See "Machinery Cost of Farm Operations in Western New York," by H. H. Mowry, *Bulletin 338*, United States Department of Agriculture, p. 24.

depreciation. The depreciation of a grain binder covering an average of 85 acres per year was only about 7.4 per cent as compared with about six per cent when the machine covered an average of only 15.5 acres per year.

3. *Depreciation.* — There are many methods of figuring depreciation, but the usual method employed by farmers is to subtract the value the machine will have as junk when it is worn out from its first cost and divide the remainder by the number of years the machine is expected to last. The quotient will be the amount to be charged each year for the depreciation of the machine. This may also be expressed by a percentage. For instance, if a machine will last eight years, the depreciation per year is 12.5 per cent of the first cost minus the junk value. Farmers should be careful not to make the mistake of figuring the same percentage for a secondhand machine or an old machine that they would figure for a new machine. If it is found that a new machine will last for ten years and that the percentage of depreciation is ten, it would be a mistake to figure the depreciation on a machine which was bought after five years of use as ten per cent, for this machine has only five years of life remaining.

The above methods assume that the depreciation is the same each year. But a machine may depreciate more rapidly some years than others. In the first place, there is considerable depreciation shortly after the machine is bought because it then becomes a secondhand machine. Perhaps the physical depreciation is more rapid in the later years of life. In view of these facts, if a man is buying a secondhand machine capable of lasting five years and which has been used for five years, he might not be justified in figuring its present value as fifty per cent of the value when new.

The years of life of any particular machine will vary greatly according to the conditions under which it is used. However, it is possible to determine averages for various machines which

will be a guide to farmers in making estimates of depreciation. The table on the following page is based on a number of studies of depreciation.

The average rate for all the machines in the table is 7.5 per cent. It is probable that about eight per cent is a reasonable average figure to employ if one wants to calculate the rate of depreciation on all machinery on the farm without estimating it for each particular machine.[1]

4. *Relation of shelter to depreciation.* — Much has been written as to the importance of providing proper shelter for machinery. Many farmers are exceedingly careless about this. Some writers have overemphasized the importance of protecting machinery, and others have gone to the extreme of asserting that the economy involved in protection is not very great. The fact is that a good deal depends on climate. It is estimated that in New York it would pay to spend as much as twenty per cent of the total value of machinery in providing shelter, whereas in Nebraska because of drier climate, it would pay to spend no more than ten per cent of the value of the machinery for shelter.

Implement sheds for sheltering machinery should be convenient in construction. A shed should be so constructed that it is easy to get the machine in and out of the shed.

5. *Interest.* — The rate of interest on the investment in machinery will, of course, vary according to credit conditions in different sections. In some sections as much as ten per cent or more is paid on machinery bought on credit from machinery companies. The rate of interest should be figured on the average investment in machinery. Average investment may be figured according to the following formula:

$$\text{Average investment} = \text{1st cost} \times \frac{\text{years of service} + 1}{\text{years of service} \times 2}.$$

[1] It is customary to employ ten per cent as a rough figure. This is probably too high if the machinery is kept in repair.

TABLE 8. ANNUAL RATE OF DEPRECIATION OF VARIOUS FARM MACHINES

Name of Machine	Per Cent	Name of Machine	Per Cent
Plows		*Hay machinery*	
Walking plows	6	Mower	7
Sulky plows	7	Rake	6
Gang plows	6	Loader	6
Engine plows	10	Tedder	7
		Stacker	10
Harrows and cultivators		Grass seeder	4
		Wagons, etc.	
Spike tooth	6		
Spring tooth	8	Wagons	5
Disk	7	Racks	11
Corn cultivator	7	Sleds	5
Horse weeder	6		
Riding cultivator	8	*Potato machinery*	
Packer	4	Cutter	12
		Treater	10
		Sprayer	7
Grain machinery		Digger	7
		Sorter	7
Binder	7	Planter	8
Drill	7		
Fanning mill	5		
Smut mill	7	*Engines*	
Seed cleaner	7	Stationary	10
Wild oat mill	7	Tractor (gas)	13
Grain tank	5		
Separator	8	*Miscellaneous*	
		Manure spreader	9
		Silage cutter	7
Corn machinery		Harness (heavy)	7
		Cream separator	7
Corn binder	8	Incubator	7
Corn planter	8	Bean harvester	8
Corn sheller	9	Milking machine	8
Corn grader	11	Cabbage transplanter	8
Corn husker	9		

Average rate 7.5 per cent

6. *Repair costs.* — There is great variation in different machines as to the per cent of value annually expended in repairs. The following table shows the percentage of average repair costs to the first cost for different kinds of implements.

TABLE 9. PERCENTAGE OF AVERAGE ANNUAL REPAIR COSTS TO THE FIRST COST FOR DIFFERENT KINDS OF IMPLEMENTS[1]

Implement	Per Cent of First Cost Expended Annually for Repairs
Walking plow	20.5
Sulky plow	5.0
Spring-tooth harrow	4.3
Spike-tooth harrow	2.0
Disk harrow	1.8
Grain drill	1.8
Corn planter (one row)	5.8
One-horse cultivator	5.4
Riding cultivator	3.1
Mower	4.4
Hayrake	1.5
Hay tedder	1.2
Grain binder	1.6
Corn binder	1.6

[1] "Machinery Cost of Farm Operations in Western New York," by H. H. Mowry, *Bulletin 338*, United States Department of Agriculture.

The cost of repairs depends greatly on whether they are made on the farm or by blacksmiths and other mechanics. It is important not only to consider the actual money cost but the loss in time through delays involved in taking implements to town and waiting until they are ready for use — that is, the cost may be very great in rush seasons when the crop depends on some implement. For this reason it is desirable that the farmer be able to make as far as possible his own repairs and that he be equipped for this purpose. Moreover, it is desirable

that he make repairs in proper season, especially using periods of slack work to get implements in good shape for the period of active use. A general overhauling once a year, tightening bolts, adjusting cutting devices and bearings, and careful oiling, will save many breakdowns.

7. *Duty of farm implements.* — The total amount of work that a machine will accomplish under normal conditions of use for a given period of time — a day or a year — is called the duty of the machine.

The previous discussion has shown that the annual cost of farm machinery for depreciation, interest, and repairs does not vary directly with the amount of use. Hence, to determine the actual cost per day or per acre it is important to know how many days the machine will be used during the year; for the cost per day will be ascertained by dividing the total annual cost for these purposes by the number of days in use, and of course the cost per acre will be determined by dividing the cost per year by the number of acres of work accomplished per year. If the machine is one that is used three hundred sixty five days in the year, for instance, the milking machine, the yearly cost should be divided by three hundred sixty-five; if used only fifteen days a year, it should be divided by fifteen, etc. A number of machines are used only a few days a year on the farm of average size, and consequently for these machines the daily cost runs high. How much this cost depends on the duty of machinery is indicated by the following table which shows in the case of western New York the estimated costs per day and per acre to operate each kind of machine when a small average acreage was covered per year and when a larger average acreage was covered per year.[1]

The table also shows how expensive some machines are when expense is measured by the cost per day or per acre. Thus

[1] "Machinery Cost of Farm Operations in Western New York." The figures do not reflect the general changes in prices resulting from the World War.

TABLE 10. RELATION OF MACHINERY COSTS TO ACREAGE COVERED PER YEAR

	Average Acreage Covered per Year		Machine Costs (Depreciation, Interest at 6%, and Repairs)	
			Per Day	Per Acre
Walking plows	low	15.6	$0.25	$0.15
	high	68.5	0.15	0.08
	av.	32.9	0.17	0.10
Sulky plows	low	14.3	0.84	0.43
	high	55.1	0.52	0.23
	av.	30.9	0.59	0.28
Spring-tooth harrows	low	29.5	0.79	0.08
	high	222.3	0.29	0.02
	av.	71.1	0.43	0.04
Spike-tooth harrows	low	15.7	0.62	0.05
	high	166.6	0.38	0.02
	av.	48.3	0.47	0.03
Disk harrows	low	16.7	1.40	0.18
	high	99.0	0.45	0.05
	av.	35.2	0.83	0.10
Grain drill	low	20.2	2.95	0.33
	high	117.5	0.92	0.09
	av.	46.3	1.71	0.17
One-horse cultivator	low	6.8	0.51	0.12
	high	57.9	0.12	0.03
	av.	16.9	0.25	0.06
Riding cultivator	low	14.7	1.87	0.26
	high	124.8	0.38	0.06
	av.	39.3	0.82	0.12
Hayrakes	low	17.8	2.19	0.15
	high	84.9	0.65	0.04
	av.	43.0	1.09	0.07
Hay tedder	low	9.9	5.10	0.35
	high	52.2	1.21	0.09
	av.	21.6	2.61	0.18
Grain binder	low	15.5	8.15	0.80
	high	85.0	2.42	0.22
	av.	35.2	4.11	0.40
Corn binder	low	10.1	9.78	1.67
	high	32.5	3.24	0.57
	av.	21.2	4.76	0.83
Mowers	low	13.8	3.18	0.36
	high	88.8	1.04	0.10
	av.	28.0	1.90	0.21

the corn binder operated on ten acres per year costs nearly $10 per day and $1.67 per acre. Grain binders, mowers, and hay tedders are also comparatively costly per day. It is estimated that the total cost per day under eastern conditions for two-row corn planters is $7.89. Nevertheless, the cost per acre is not high because a rather large acreage is covered per day.

A knowledge of the duty of machinery per day is especially important if one is comparing the relative advantage in using a machine with other methods of accomplishing the work.

It is possible to calculate mathematically the daily duty of any machine by knowing the average speed at which it will travel and the number of feet covered in width. For instance, if we could assume that a machine would travel an average of two miles an hour for ten hours a day and that it would cover five feet in width on each trip around the field it would be possible to calculate the acreage that would be covered per day. As a matter of fact, however, the various factors involved are subject to considerable variation. Speed is likely to be determined according to whether horse power, ox power, or tractor power is employed. Generally speaking, tractors travel a fraction of a mile per hour more rapidly than horses, and some tractors may be made to travel more rapidly than others, for some tractors may be operated at various speeds. Moreover, the speed of travel, especially for horses, is affected by the load, the shape of the fields, the condition of the land, the skill of the operator, the condition of the machinery as affecting the number of breakdowns or stoppages for repairs. Width covered is affected not only by the kind and size of machine but also by the degree of overlapping.

It has been customary to figure speed of horses about 2 miles per hour. However, it has been estimated that in plowing the average speed is from $1\frac{2}{3}$ to $1\frac{9}{10}$ miles per hour, allowing for stops and turns. For an implement having a spread of twelve inches in width it would be necessary to travel

$8\frac{3}{10}$ miles to cover an acre, and the accomplishment for such an implement at a speed of 2 miles per hour would be approximately 2.4 acres per ten-hour day. For a twelve-inch plow, however, there is a certain amount of overlapping so that two horses and a twelve-inch plow may cover approximately 1.75 acres in a ten-hour day. Three-horse teams with twelve-inch plows will travel enough faster to make possible the plowing of 2.4 acres per day. Of course, estimates of what can be done theoretically will be higher than the average estimates of what is done day in and day out because we must allow for delays and stoppages from various causes.[1]

III. How to determine the economy of various farm processes with horse power. — 1. *The problem of economy in plowing.* — In the North plowing is probably the most important farm process and the one that is likely to set the limit to crop acreage per unit of man labor and to determine the requirements of the farm as to horse power. The requirements as to horse power in turn are likely to have much to do in determining the kind and size of other implements employed.

In many parts of the North it is found economical to use large horses in plowing and either single-bottom plows of considerable width or gang plows. The latter are found especially economical because of the saving in man labor. It may be that gang plows are not economical for all farms because of the presence of stones, stumps, the small size of fields, and other conditions, but it is safe to conclude that they would effect a great economy on many farms where not now employed.

While plowing is the most common farm process, it is more difficult than many other processes to reduce to standard figures,

[1] Adapted from "A Normal Day's Work for Various Farm Operations," by H. H. Mowry, *Bulletin 3*, United States Department of Agriculture, pp. 43–44.

Professor G. F. Warren states that the average of a large number of cases showed 1.4 acres per day. *Farm Management*, p. 359.

because, more than most other processes, plowing is affected by such conditions as texture of soil, shape of the land, amount of moisture, presence of stones, stumps, and other obstacles, size and shape of fields, size of horses, kind and size of plow, depth of plowing, and whether plowing is done on new ground or on old ground. The figures in the following table show the results of a large number of inquiries conducted by the United States Department of Agriculture.

TABLE 11. ACRES PLOWED PER DAY WITH DIFFERENT SIZED TEAMS AND DIFFERENT KINDS OF PLOWS[1]

Kinds of Plows	No. of Horses	Acres per Day
Walking	2	1.62
Walking	3	2.64
Sulky	2	1.87
Sulky	3	2.81
Sulky	4	2.94
Gang	4	4.83
Gang	5	5.19
Gang	6	5.15

[1] Derived from Table 47 in Mowry's " A Normal Day's Work for Various Farm Operations. "

While absolute conclusions applicable to various sections of the country should not be drawn from the figures in Table 11, the figures serve to illustrate some of the problems involved in estimating the comparative economic advantages of plowing under different physical and economic conditions.

Judging from the results in this table, it would seem to be economical to use three horses for walking plows, for the third horse adds more than either of the other two besides requiring no greater expense for man labor or machine cost. Likewise, in the case of sulky plows three horses average a larger acreage per horse than two. Four horses, however, would appear to

constitute superfluous power except for very deep plowing and very heavy land when employed with sulky plows, for the fourth horse adds so little to what could be plowed by three as scarcely to justify the extra expense. With horse labor $1.25 per day, which was the average estimated cost in certain states in 1916,[1] and man labor costing $1.10 per day, the average estimated cost of monthly labor without board in the same states in 1916, plowing with sulky plows and four horses, would have cost $2.28 per acre as compared to $1.94 per acre with three horses.

Assuming no difference in daily machine cost, the figures in the above table indicate that a four-horse gang plow pays better than a three-horse sulky plow, for, whereas the sulky plow averages .94 acre per horse, the fourth horse on a gang plow adds 2.02 acres to what the three-horse sulky plow will accomplish. However, we must also consider whether the extra gain of the fourth horse is more than offset by the extra cost of the gang plow. A study made by the writer in 1914 shows that gang plows cost about fourteen per cent more per day than sulky plows or in the present case about ten cents more per day. Since the fourth horse plows 1.08 acres more than each horse employed with the sulky plow (2.02–0.94), it is clear that the extra ten cents per acre for the use of the gang plow is more than offset by an additional acreage of 1.08.

On the basis of the above table how many horses are economical for gang plows? It is clear that the sixth horse is unprofitable under average conditions, although undoubtedly it is justified by very heavy plowing, such as plowing sod. The fifth adds 0.36 acre to the product of four horses, which averaged 1.21 acres per horse. It would not appear, then, that under the conditions of the table the fifth horse would be profitable. However, the extra acreage involves no greater

[1] "Cost of Keeping Farm Horses and Cost of Horse Labor," by M. R. Cooper, *Bulletin 560*, United States Department of Agriculture.

expense for machines or man costs. The real question is then whether the additional cost of the fifth horse is less than what the 0.36 of an acre would have cost to plow with four horses. The facts as to cost may be summarized as follows:

COST PER DAY (ASSUMING HORSE LABOR WORTH $1.25 PER DAY AND MAN LABOR $1.10 PER DAY)

	Machine Costs	Man Labor	Horse Labor	Total per Day	Acres Plowed	Cost per Acre
4 horses . . .	0.69	1.10	5.00	6.79	4.83	1.41
5 horses . .	0.69	1.10	6.25	8.04	5.19	1.55

It is clear that the addition of the fifth horse costs more than the acreage added by this horse would have cost if plowed by a four-horse team. It is probable, however, that except under most favorable conditions four horses are much overloaded by a gang plow. In fact, the above figures are given merely to illustrate methods of calculating relative economy of different ways of plowing.

2. *Harrowing.* — In harrowing with spike-tooth harrows each horse may be loaded on the average with four and one-half to five and one-half feet in width and go once over from 8 to 10 acres a day. When farmers have enough horses and man labor is scarce, it may be economical to use four-horse teams, covering from 30 to 40 acres per day. The draft of spring-tooth harrows is greater than that of spike-tooth harrows, and a given amount of power can cover approximately but sixty per cent of the acreage that could be covered with the spike-tooth harrow.

It is clear that in deciding on the size of teams and harrows much will depend on horse labor, on the supply of man labor, and on the demand for horse labor and man labor at the time the harrowing is done. If there are two men or a man and a boy

available, it may pay to let the extra man or boy harrow with whatever number of horses are not required for plowing. Each farmer must solve the problem according to circumstances. Thus suppose the farmer has two men and six horses; it may pay to plow with four horses while the other man is harrowing with two. If the land is very heavy and a gang plow is used, it may pay to employ all six horses in plowing, letting the other man do work not requiring horse labor and then do the harrowing all at once, putting two teams or one large team to harrowing when the horses are not employed in plowing.

In disk harrowing the majority of farmers use four horses, and some employ as many as five or six on widths of nine or ten feet or more. The draft of this implement is greater than that of the spring-tooth harrow for the same width. The usual width is eight feet. It is estimated that each horse on freshly-plowed land will cover nearly 4 acres per day, and fifteen to twenty per cent more on well-packed land. These estimates do not allow for what is called *double-disking* — that is, a fifty per cent lapping each round.

3. *Planting.* — In planting corn or cotton, it is estimated that a one-row planter pulled by one horse will plant 7 to 8 acres per day, and twenty-five per cent more when pulled by two horses. A two-row planter will cover nearly double the acreage accomplished by a one-row planter pulled by one horse. The machine costs for two-row planters are usually so high on small farms that it may not pay to employ two-row planters, costing nearly $8 per day for machine costs as compared with $2.50 for one-row planters. In fact, on small farms many farmers still find it economical to use hand planters for small acreages. In the Corn Belt, however, two-row planters are commonly employed.

In the case of grain drills it is estimated that each horse can be loaded with two and one-half to two and three-fourths feet in width of drill and will cover about 4 acres per day. When

oats are sown with end-gate seeders, as in the Corn Belt, about 50 acres per day is covered by the ordinary outfit.

4. *Spreading manure.* — Manure may be spread by hand or with a manure spreader. Since manure must be loaded by hand, the only saving by using manure spreaders is in unloading and spreading, and this is not a complete saving, for the time required for horses and men in spreading with the machine must be considered. Moreover, the heavy draft requires from three to four horses as compared with two or three horses for the ordinary load in spreading by hand. It is estimated that about nine loads per day can be spread with a wagon and thirteen loads with a manure spreader. About a third of the time of a man and two or three horses is saved. To offset this there is the cost of an extra horse and the extra machine cost of the manure spreader. Unless the amount to be spread is large, it is doubtful whether it pays the farmer to own a spreader. It should be recognized, too, that the work may be done at the least-busy season of the year.

5. *Cultivating.* — In cultivating intertilled crops with one-row cultivators, it is estimated that two horses cover about forty per cent more than one horse. The average day's accomplishment for cultivating cotton and corn is about $4\frac{1}{2}$ acres for one horse and from 6.75 to 7 for two horses. A two-row cultivator with three horses will cover 14 to 15 acres.[1]

6. *Harvesting grain with a binder.* — Since the draft of a binder is due principally to the weight of the machine and to propelling the gearing mechanism, increasing the width of the cut up to eight or ten feet does not add proportionately to the load on the horses.[2] Apparently, while three horses with a six-foot binder will cut about 10.5 acres per day, four horses with an eight-foot binder will cut 17 to 18 acres a day. In

[1] Mowry's "A Normal Day's Work."

[2] Another consideration is that for the eight-foot width the lap need be no greater than for the six-foot width.

the first case the average is 3.6 acres per horse, and in the second 4.25 acres per horse. If the acreage is considerable and the horses are available, there can be no question but that the eight-foot binder is cheaper than the six-foot. Assuming man labor at $2 per day and horse labor at $1.20 per day, and with the prewar cost for binders, it has been estimated that the cost per acre for a six-foot binder drawn by three horses, is $1.11 and for an eight-foot binder drawn by four horses eighty-eight cents.[1]

7. *Harvesting with the header and combine.* — In some parts of the West the header, a machine that merely cuts the heads from the grain leaving the straw standing, is commonly employed. It is used more in the dry areas of the Northwest where weather conditions are most favorable to its use. Although usually there is a slight saving in harvesting with a header as compared with the binder in most sections, there are some seasons when it is impracticable to run the header so that it is common to have binders on farms where headers are in use.[2]

In some sections where weather conditions are favorable, grain is harvested and threshed at the same time by means of a machine generally known as a combine. It is said that this is by far the cheapest method of harvesting wheat. Great progress is being made in the improvement of these machines.

In some sections when grain is cut with a binder, it is customary to haul the grain to the separator from the shock, while in others it is customary to stack the grain after it is properly ripened and to thresh from the stack. The cost of stacking is little, if any, greater than is the cost of hauling from the shock to the separator when threshing. Stacking has the advantage

[1] "Cost of Harvesting Wheat by Different Methods," by Arnold P. Yerkes and L. M. Church, *Bulletin 625*, United States Department of Agriculture.

[2] For further discussion of advantages and disadvantages of headers and combines see *Ibid.*

that threshing may be postponed until the most convenient time, and it is said that when grain is properly stacked it undergoes a sweating process which improves its quality to some extent. Generally speaking, the methods used in stacking wheat are more economical in the Middle West than in the East. In the East it is customary for one man to pitch the bundles while another stands on the wagon to arrange the bundles. In the West special bundle wagons are so constructed that both men can engage in pitching the bundles to the wagon. Six acres per day for two men and a team appears a fair day's work in stacking wheat under eastern conditions; under western conditions more efficient methods make possible 8 acres per day for two men and two horses and 10 acres for two men and four horses.[1]

QUESTIONS ON THE TEXT

1. If by the use of machinery the farmer saves, say ninety per cent of the labor required a hundred years ago to produce a bushel of wheat, does this measure the actual total saving of labor from the standpoint of society as a whole? Why?
2. Has the development of farm machinery economized most in labor or in land?
3. About what proportion are machinery costs of the total costs of crop production?
4. What items enter into the annual cost of owning farm machines?
5. Why does the cost per day of using machines decrease as the number of days used per year increases?
6. How would you figure the depreciation on a new machine? On a secondhand machine just purchased?
7. What proportion of the value of farm machinery could you probably afford to spend in providing shelter? Why would the proportion be higher in a dry than in a wet climate?

[1] *Bulletin 627*, United States Department of Agriculture, p. 14. The data on machinery are given above only for a few of the most common farm processes. Data on other processes may be obtained from some of the bulletins listed at the close of this chapter.

8. In calculating the annual interest on farm machinery, would it be proper to multiply the cost when new by the rate of interest? Explain.

9. What percentage are annual repair costs to the value of the machine in the case of walking plows? Sulky plows? Grain binders?

10. What general policy should a farmer pursue in regard to repairing farm machinery?

11. What is meant by the duty of farm implements? What is the relation between the duty and the cost per acre of using the machine?

12. Show that a machine may have a small first cost and even a small annual cost, but a high cost per day of use. Illustrate.

13. Mention the various conditions that determine the daily duty of a plow.

14. What is the approximate daily duty per horse for spike-tooth harrows? For disk harrows? For one-row planters? For grain drills? For one-row cultivators? For binders?

SPECIAL PROBLEMS

1. A farmer pays $75 for a new mower. Supposing it will last fourteen years, what is the rate of depreciation per year? What is the cost of depreciation per year?

2. Assume that the farmer bought a secondhand mower for $40 which had been used three years, what would be the cost of depreciation per year on the assumption that a new mower would last fourteen years?

3. Suppose at the end of the fourteen years the mower will be worth $5 as junk, how will this affect your answers to problem 1?

4. A farmer has machinery worth $642. The average annual depreciation is seven per cent if proper shelter is provided and twelve per cent if no shelter is provided. In order to provide shelter the farmer must build an implement shed at a cost of $620, which will depreciate at the rate of five per cent and cost seven per cent interest. How much would the farmer save by building the shed?

5. A farmer buys a separator for $820. The depreciation is ten per cent a year when the machine is used two weeks and increases one per cent for each additional two weeks of use. The repairs cost $26 per year for two weeks' use and $5 for each additional two weeks. Interest is seven per cent. What is the cost per day for two weeks' use? If the farmer does two weeks' additional work threshing for neighbors, what is the total additional machine cost? What is the additional cost for each additional day? How much is the average cost per day of use reduced?

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HUMPHREY, H. N., and YERKES, A. P., "Minor Articles of Farm Equipment," *Farmers' Bulletin 816*, United States Department of Agriculture.

CHAPTER XII

FARM POWER

I. Horse power
   1. Annual cost of horses
   2. Offsets to horse costs
   3. Efficiency in the use of horses

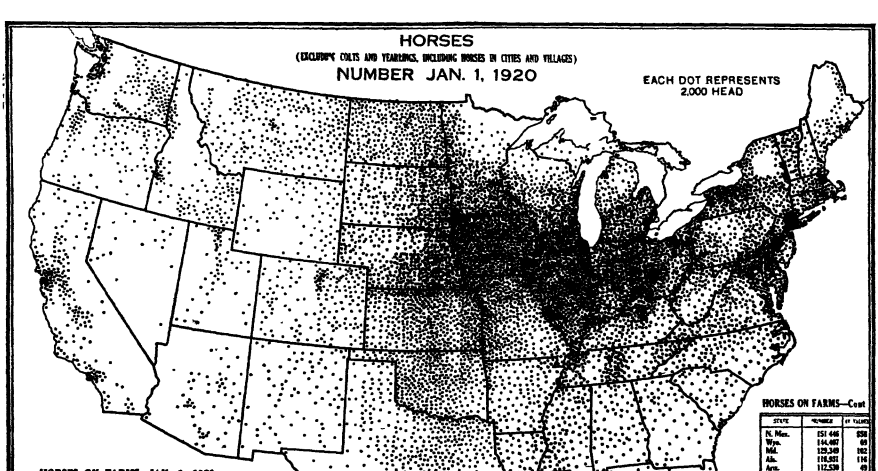
II. Extent to which the tractor is capable of doing the work of horses

III. Advantages and disadvantages of tractors for uses in which they may take the place of horses

IV. Tractor costs
   1. Depreciation of tractors
   2. Repair costs
   3. Interest costs
   4. Items in cost per day
   5. Total daily cost
   6. Normal day's work for tractors

In organizing the farm for efficiency, it is important to devote much attention to the most economical arrangements for obtaining the necessary power for farm operations. The cost of farm power is from thirty to forty per cent of the total operating expenses of the farm. Moreover, economy of man labor is frequently involved in the problem of economizing farm power; and expenses for both power and man labor represent normally from eighty to ninety per cent of the total operating expense, which is the most immediately controllable part of the total expense involved in farming.

I. Horse power. — 1. *Annual cost of horses.* — As in the case of machinery, cost of employing horses depends partly



Yearbook Separate 878, U. S. Dept. of Agr.

FIG. 31. — NUMBER AND DISTRIBUTION OF HORSES

Over one quarter of the mature horses are in the Corn Belt. The small number of horses in the Cotton Belt and the eastern sections of the corn and winter wheat region is partly owing to the preference for mules.

on the annual cost and partly on the amount of use made per annum. There is some additional cost when greater use is made of horses, but normally this additional cost is by no means in proportion to the amount of use made.

Table 12 shows by items the average costs for a period of six years of keeping work horses in the State of Illinois:

TABLE 12. AVERAGE ANNUAL COST OF KEEPING ONE HORSE, 1913–1918[1]

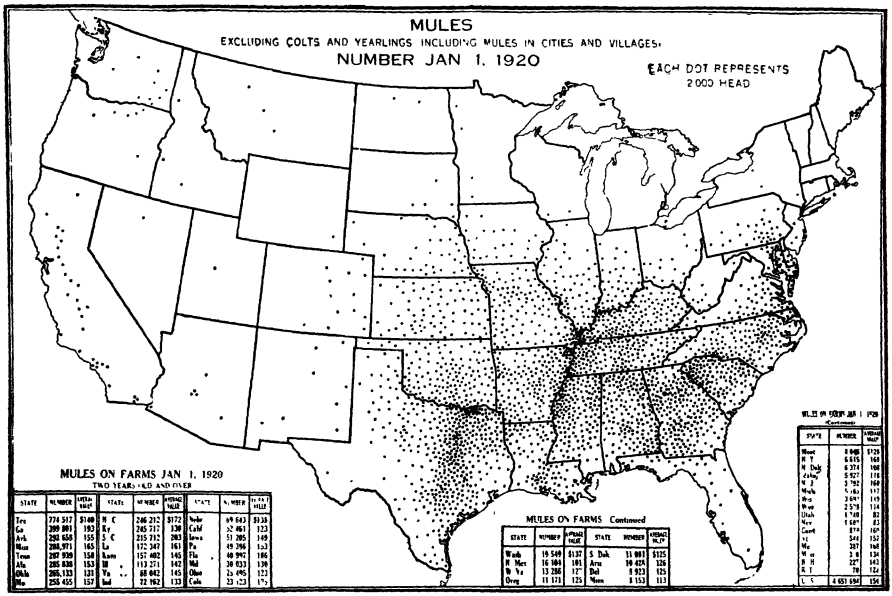
Year	Feed	Labor	Interest	Shelter	Harness	Misc.	Total
1913	$59.27	$11.88	$8.58	$3.73	$3.24	$1.09	$87.79
1914	59.19	10.69	8.72	2.91	3.36	2.22	87.09
1915	65.90	11.85	8.43	4.27	4.27	2.18	96.02
1916	63.73	10.66	7.24	3.16	3.16	2.50	90.16
1917	103.18	11.80	7.79	3.72	3.72	1.54	130.94
1918	122.14	13.66	8.78	3.75	3.75	4.96	156.58

It will be noted that the largest part of the cost is for feed (including bedding) and the next largest for labor, the first item averaging about seventy-two per cent and the latter about eleven per cent. Harness costs are included in order that the cost of horses may be compared with the cost of tractors.

Depreciation, one of the items ordinarily included in cost, is not given in the above table because the cost of feeding and raising colts to replace horses is included in the feed and labor costs. There has been much dispute as to whether depreciation is an item of expense in the case of work horses. Some farmers say that there is no depreciation. The fact is that from

[1] "The Horse and the Tractor," by W. F. Handschin, J. B. Andrews, and E. Rauchenstein, *Bulletin 231*, Illinois Agricultural Experiment Station, p. 179.

For other studies of the cost of keeping horses, see "Cost of Keeping Farm Horses and the Cost of Horse Labor," by E. R. Cooper, *Bulletin 560*, United States Department of Agriculture, and "The Cost of Producing Minnesota Field Crops, 1913 to 1917," by F. W. Peck, *Bulletin 179*, Minnesota Agricultural Experiment Station.



Yearbook Separate 878, U. S. Dept of Agr.

FIG. 32. — NUMBER AND DISTRIBUTION OF MULES

About five sixths of the mature mules are in the Cotton Belt and the corn and winter wheat region.

the time horses begin work at three or four years of age until they reach about eight years of age there is really an increase in their physical efficiency and also generally in their value (assuming no fall in the general market value of horses). Consequently the farmer who works his horses until they are from six to eight years of age and then sells and buys again or replaces from young stock may suffer no loss from depreciation. There would appear to be considerable advantage in this practice, for the depreciation is rapid after eight years of age. However, the advantage is partly offset by the disadvantage of having to break in new teams more frequently. Many farmers prefer to use old horses because of their reliability and good habits. In sections where the raising of colts is economical it may be considered that there is no depreciation in the work horses because they are replaced by the colts.

2. *Offsets to horse costs.* — In addition to the work done by horses there are certain offsets which may be credited against the cost of keeping work horses. In the first place, the manure usually may be considered to have some value. In many sections it is safe to count the manure as worth $1 per ton. The estimated annual value of the manure per horse, as shown by a study made in 1916, varied from $5.24 in Illinois to $13.36 in New York, the difference being largely due to variations in the effectiveness of arrangements for preserving and employing the manure.[1] In some sections the value of the colts is also an offset.[2]

3. *Efficiency in the use of horses.* — Various studies have shown that the average number of hours' use of horses per day throughout the year ranges from three to five, while the average for man labor is from eight to nine. In general, it may be considered that a comparatively full use has been made of horse labor when the average is as high as five or five and

[1] *Bulletin 560*, United States Department of Agriculture, p. 14.
[2] *Ibid.*, p. 13.

one-half hours per day, for there are a number of days in the year when horses will not be used at all.

There is considerable variation between different sections of the country and different systems of farming in the average number of hours of horse labor used per year. It does not necessarily follow that a low average means inefficiency or that

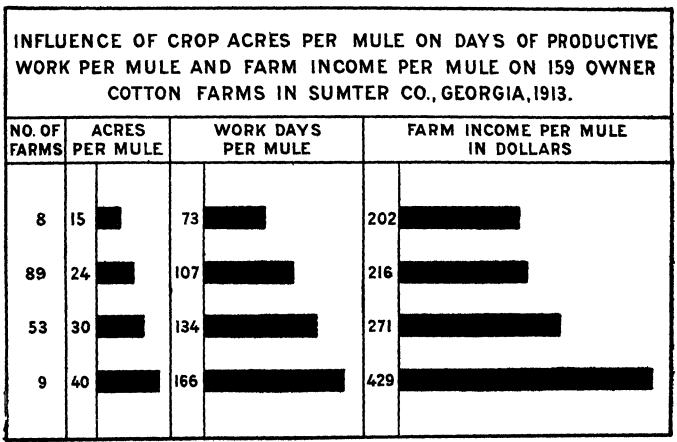


FIG. 33

A reorganization of the cropping system designed to increase the annual number of work days per mule is reflected in farm income per mule.

a high average represents unusual efficiency. However, it is probable that by proper changes in farm organization and a better farm management a fuller use may be made of horses. For instance, the extreme differences in efficiency in the use of horse labor measured by several different standards, shown by a study in one of the most important live-stock producing regions of Illinois, were found to be as follows:[1]

[1] *Bulletin 231*, Illinois Agricultural Experiment Station, p. 183.

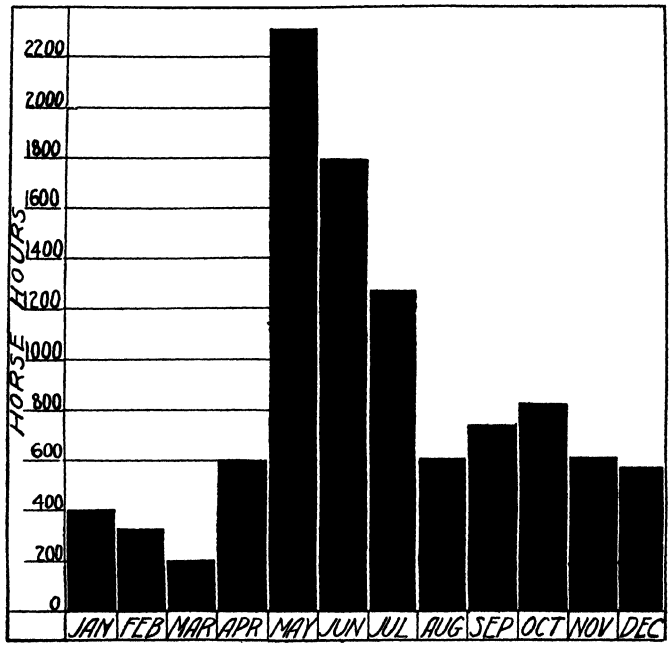
Crop Acres per Horse		Hours of Horse Labor per Year		Hours of Horse Labor per Day		Cost per Acre	
Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
12.92	25.13	5.43	15.82	1.74	5.09	$0.0524	$0.1520

It will be noted that the cost per acre of the farms on which the horses were most efficiently used was only about one third as great as on the farms where they were least efficiently used. It is estimated that the difference between the minimum and the maximum involves a difference of about $475 per year in the cost of operating a five-year rotation of 150 acres.[1]

There are a number of ways in which it may be found possible to make a more efficient use of horse labor. Investigations have shown that on many farms considerable economy can be effected in the cost of feeding. Again, attention to the raising of good colts may occasionally result in a reduction of cost. Studying methods of avoiding depreciation, especially by not keeping work horses too long, is a possible source of economy. In some cases it may be that more horses are being kept than are really needed for farm operations. The fuller and more efficient use of horses may involve a reorganization of the field system so that productive work for horses may be provided at times when they would otherwise be idle. A good farm layout and proper arrangement of fields will frequently make it possible to operate a larger crop acreage per horse. Again, it will be found that horses are needed for some operations which may be postponed until the horses will not be needed for other things. A careful classification and scheduling of operations into fixed, semifixed, and movable — that is, operations that must be done at a particular time, operations that may be done

[1] *Bulletin 231*, Illinois Agricultural Experiment Station, p. 185.

at any time, and operations that are preferably done at a particular time but may, if necessary, be postponed — will make it possible to study more intelligently the problem of making

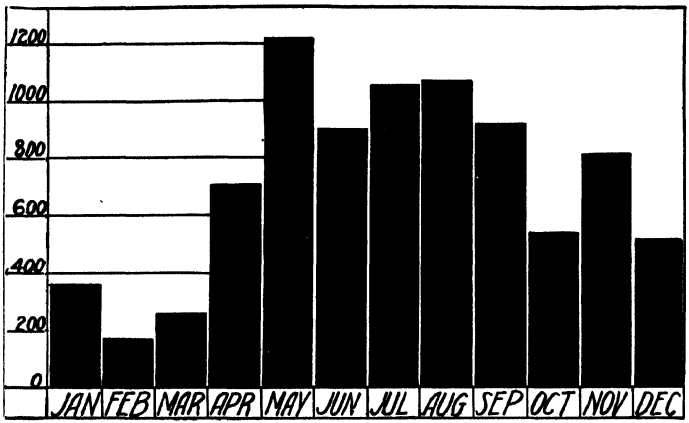


Bulletin 231, Illinois Experiment Station.

FIG. 34. — HOURS OF HORSE LABOR PER MONTH (Poor distribution)
Poor monthly distribution of horse labor resulting on a 320-acre farm from a poor rotation, including little fall plowing and very little winter feeding of live stock.

fuller and more efficient employment of horse labor. (See Figures 34 and 35.)

Frequently a more efficient use of horse labor is dependent on increasing the size of the team, which, in turn, is dependent on increasing the size of the farm. This is illustrated in Table 13.



Bulletin 231, Illinois Experiment Station.

FIG. 35

The figures at the left indicate horse hours. Good monthly distribution of horse labor secured on a farm of 160 acres by the use of a good crop rotation, including a considerable amount of fall plowing and the winter feeding of live stock.

The relation between size of farms and efficiency in the use of horses is shown for a cotton-producing region in the following table:

TABLE 13. RELATION OF SIZE OF FARMS TO EFFICIENCY IN USE OF HORSE LABOR[1]

SIZE OF CROP AREA	NUMBER OF FARMS	AVERAGE SIZE OF CROP AREA	HORSE LABOR DAYS PER HORSE	ACRES PER HORSE	HORSE LABOR DAYS PER ACRE	COST OF HORSE LABOR PER CROP ACRE	COST OF WORK STOCK PER DAY OF LABOR
80 acres or less .	37	62.5	60.3	18 5	3 25	$5.47	$1.68
81 to 120 acres .	39	100.1	66.7	20.6	3.22	4.95	1.54
121 acres and more	38	188.9	79.1	25 2	3 14	3.99	1.27
All farms . . .	114	117.5	71.7	22.4	3 19	4.53	1.42

[1] "A Farm Management Study of Cotton Farms of Ellis County, Texas," by Rex E. Willard, *Bulletin 659*, United States Department of Agriculture.

II. Extent to which the tractor is capable of doing the work of horses. — While the tractor is capable of being substituted for horses in certain activities, such as in plowing and in other kinds of field work, it is clear that there are some activities which the tractor cannot perform at all, especially on diversified farms, as, for instance, cutting corn, plowing in gardens and small patches, miscellaneous hauling about the farm, and other activities in which it is possible to use the tractor but not to very good advantage, as, in pulling a hay loader.

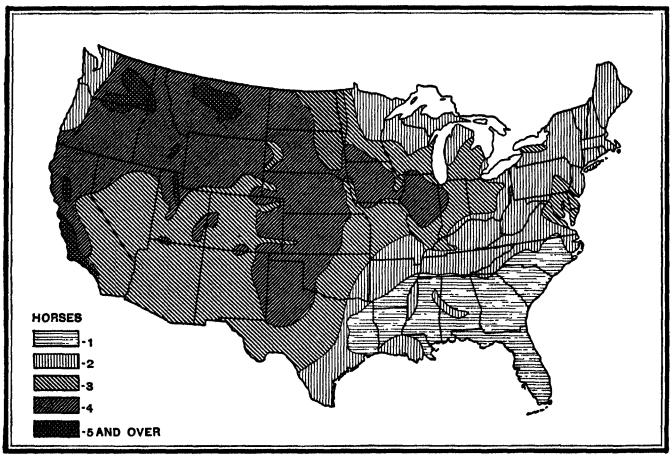
Moreover, even for operations in which it is physically possible to employ the tractor it is usually undesirable to use one when even a small tractor would represent a considerable excess of power. There are many operations in general farming which are for one reason or another performed by a two-horse team or even by one horse. An analysis of the use of teams on a number of farms representing different systems of farming in order to determine the per cent of the total horse power used in various sized teams is shown in the following table:

TABLE 14. PERCENTAGE OF TOTAL HORSE POWER USED IN VARIOUS SIZED TEAMS[1]

Size of Team	Number of Horses in Team									
	1	2	3	4	5	6	7	8	9	
	%	%	%	%	%	%	%	%	%	%
Wisconsin (dairy farm)	9	41	48	2	—	—	—	—	—	100
Wisconsin (dairy farm)	2	71	11	16	—	—	—	—	—	100
Wisconsin (dairy, potato)	11	74	13	2	—	—	—	—	—	100
Wisconsin (grain, beef)	—	54	7	34	—	5	—	—	—	100
Illinois (corn, hogs)	2	60	9	29	—	—	—	—	—	100
Illinois (corn, hogs)	—	56	7	37	—	—	—	—	—	100
Iowa (seed grain, stock)	—	77	1	19	3	—	—	—	—	100
North Dakota (grain)	—	11	—	31	43	15	—	—	—	100
Washington (grain)	1	5	1	34	—	20	13	17	9	100

[1] "The Horse Power Problem on the Farm," by Oscar E. Juve, *Yearbook* United States Department of Agriculture, 1919, p. 495.

It appears that one- and two-horse teams comprise a minimum percentage of the total horse power employed on Washington grain farms where they amount to only six per cent and range from this up to eighty-five per cent on Wisconsin dairy and potato farms. A similar study for southern cotton farming shows a very high percentage of the total horse power employed in one-horse teams.



Yearbook for 1919, U. S. Dept. of Agr.

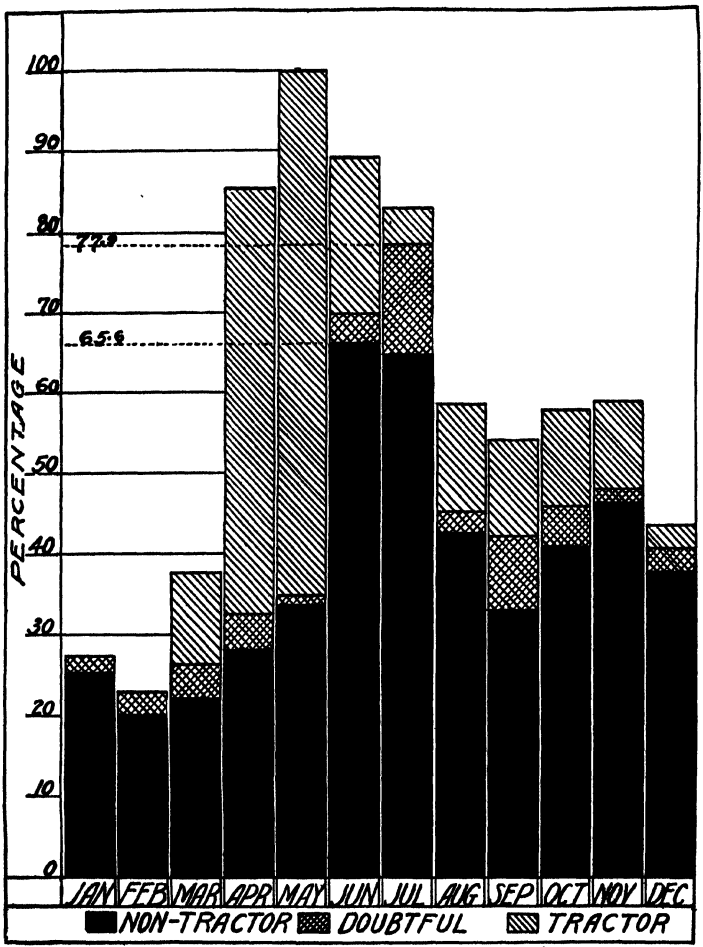
FIG. 36. — NUMBER OF HORSES PER TEAM UNIT
The United States divided according to sizes of teams ordinarily used for plowing.

Even for plowing, which is probably the operation for which tractor farming is best adapted, there are still large sections of the country using small horse power units. The practice in regard to the size of teams in the United States is geographically shown in Figure 36. Of course one should not conclude from this that in regions where small team units are employed for plowing the practice is desirable. However, other

things equal, one should consider carefully whether there may not be strong reasons for a widely prevalent practice. In the South, for instance, the use of one-horse plows may be attributed to a number of conditions. In the first place, cotton picking sets the limit to the acreage that can be operated, and there is generally an abundance of time available for field operations, including plowing. In many sections of the South the soil is comparatively light in texture making it possible to use a one-horse plow. Furthermore, wages of labor have been low, and consequently there has not been so strong a reason for economizing labor by using large team units.

In order to determine the relative extent to which tractors can take the place of horses and also how many horses would actually be released by the tractor, one should make a careful study of all farm operations, classifying them into those which can be performed economically by tractors, those which cannot be performed economically by tractors, and those which should be put in the doubtful list.

It is obvious that the number of horses that must be kept when only horses are employed will depend on how many horses are needed at a time when the labor requirements are great unless teams can be hired, whereas when tractors are kept to supplement horses the number of horses that must be retained will be determined by the number needed at the time when the greatest amount of nontractor work or nontractor and doubtful-tractor work occurs. In Figure 37 is shown the distribution by months of horse labor as found in the Illinois study referred to above. For farms keeping only horses the peak demand comes in May; on farms combining tractor and horse labor the peak demand for horses to be employed in performing nontractor work comes in June; and for horses to perform both nontractor and doubtful-tractor work the peak demand comes in July. Assuming that the tractor is capable of performing only work classed as tractor work and that all



Bulletin 231, Illinois Experiment Station.

FIG. 37. — MONTHLY DISTRIBUTION OF HORSE LABOR CLASSIFIED AS TRACTOR, NONTRACTOR, AND DOUBTFUL TRACTOR, AS AN AVERAGE OF ALL FARMS, 1913–1917

other work must be done by horses, it is evident that the peak requirement for horses to be employed in nontractor and doubtful-tractor work in July is 77.9 per cent of the maximum peak requirement for all horse work, which occurs in May. Consequently it would appear that under these farming conditions the tractor would take the place of about 22.1 per cent of the horses that would be needed if no tractors were kept.

However, the question of whether the tractor is economical involves not only the extent to which it would take the place of horses but also the extent to which it would economize in man labor. This should also be carefully studied. In the case of the Illinois farms just mentioned it was found that the introduction of the tractor would economize sixteen days of man labor.

The above facts are given not as conclusive in deciding between tractors and horses but merely to indicate some of the considerations the farmer should have in mind and to point out the methods by which he may study the problem.

Some studies have been made as to the actual displacement of horses by the introduction of tractors. On ninety-two Illinois farms where no change was made in the total acreage after the purchase of tractors an average of twelve horses per farm had previously been kept. By the introduction of tractors an average of three of the twelve horses were displaced — that is, about one fourth of the horses.[1] On two hundred and fifty-two New York farms the tractor displaced about twenty-three per cent of the horses that had been kept before the introduction of the tractors.[2] In a Pennsylvania study of forty-eight farms it was found that the average number of

[1] "An Economic Study of the Farm Tractor in the Corn Belt," by Arnold P. Yerkes and L. M. Church, *Farmers' Bulletin 719*, United States Department of Agriculture, p. 21.

[2] "The Gas Tractor in Eastern Farming," by Arnold P. Yerkes and L. M. Church, *Farmers' Bulletin 1004*, United States Department of Agriculture, pp. 24–25.

horses displaced by the tractor was 1.8.[1] In another Illinois study it was found that the average number of horses employed before purchasing tractors was 11.52, while the average number after the tractors were purchased was 9.14 or a displacement of about twenty per cent.[2]

III. Advantages and disadvantages of tractors for uses in which they may take the place of horses. — A great many vague arguments have been used in favor of the tractor. For instance, it is sometimes said that the tractor does not eat when it is not working. Though this is true, they are a heavy cost when idle, for, as in the case of other farm machinery, the depreciation and interest costs are heavy and do not vary in proportion to use.

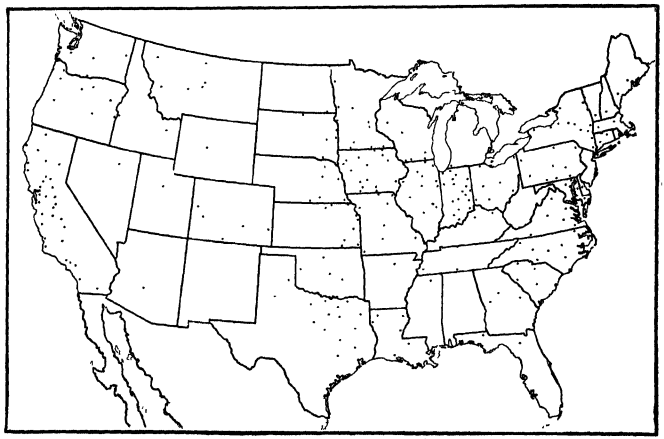
One of the real advantages of tractors is that they do the same amount of work more rapidly, especially when used to supplement horse power. There are frequently times when it is important to speed up the work to take advantage of favorable weather conditions or for use in emergencies, as, for instance, a very unfavorable planting season when the farmer is not able to be on the land as many days as is normally possible. Again, the tractor economizes man labor. While this may not be any economy if the extra cost of keeping the tractor is greater than the saving in wages, yet there are times when extra man labor is not obtainable. Another point in favor of the tractor is that most general farms need some kind of power for belt work, such as operating thrashing machines, feed binders, and silage cutters. While a stationary engine may be used for these purposes, yet the combined advantages of having the tractor both for field work and for stationary work may justify its employment. It is also pointed out that tractors will do

[1] "An Economic Study of the Gas Tractor in Pennsylvania," by S. D. Fox, *Bulletin 158*, Pennsylvania Experiment Station, p. 20.

[2] "The Horse and the Tractor," by W. F. Handschin, J. B. Andrews, and E. Rauchenstein, *Bulletin 231*, Illinois Experiment Station.

deeper plowing. This advantage, however, is probably not great if one uses a sufficient number of horses with the plow to carry on deep plowing.

Certain comparative disadvantages in the tractor should also be considered. The tractor is likely to pack the land



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FIG. 38. — NUMBER OF FARMS WITH TRACTORS, JAN. 1, 1920
(Each dot represents 250 farms)

Tractors are most numerous in the Corn Belt, in the spring and winter wheat areas, and in California. In the spring wheat area, on January 1, 1920, about 1 farm in 6 had a tractor; in the Corn Belt, in Kansas, and in California about 1 farm in 10; elsewhere in the United States 1 farm in 20 to 50, except in the states south of the Ohio and Potomac Rivers, where less than 1 farm in 100 had a tractor. The acreage of cotton a farmer can handle is not limited by the acreage he can plow and plant, as with wheat, or can cultivate, as with corn, but by the amount he can pick.

when the soil is moist, and usually one can use horses sooner after a rain than it is safe to employ a tractor. The tractor is less adaptable than horses to work on hilly land or land in which there are stumps, stones, and other obstacles. Moreover, the tractor is at a disadvantage in small and irregular fields. The tractor is very much more likely than horses to break down at

a critical time, especially if the operators are not very efficient. Of two hundred and seventeen tractor owners in New York forty-eight per cent reported that their outfits were not out of commission a single day when needed during the previous season. Of the remaining fifty-two per cent the tractors were out of commission an average of six and a fourth days when needed.[1] Similar results were shown by an Illinois study.[2]

IV. Tractor costs. — A most important consideration in comparing horse labor and tractor labor is the relative cost, and this involves a careful comparison of the various items of costs. The comparative annual cost of horses and tractors in Illinois was found to be $428.87 per tractor and $156.58 per horse — that is, it cost on the average as much to keep a tractor as it cost to keep 2.7 horses. It should be noted, of course, that in the Corn Belt the tractors generally used are of small size.[3]

1. *Depreciation of tractors.* — While the results of estimates made by farmers as obtained in several different surveys indicate an expected life of about eight years it is probable that actual experience shows the average life of tractors is shorter than this. It is doubtful if it is safe to count on more than five or six years of life.[4]

2. *Repair costs.* — The cost of repairs depends on the age of the machine. In the case of some two hundred New York farms the following costs were reported: Of eighty-six tractor owners who had used their tractors one season or less thirty-one had spent nothing for repairs. The annual repair cost for the

[1] "The Gas Tractor in Eastern Farming," by Arnold P. Yerkes and L. M. Church, *Farmers' Bulletin 1004*, United States Department of Agriculture, p. 24.

[2] "An Economic Study of the Farm Tractor in the Corn Belt," by Arnold P. Yerkes and L. M. Church, *Farmers' Bulletin 719*, p. 20.

[3] Illinois *Bulletin 81*, p. 216.

[4] *Farmers' Bulletins 719*, p. 13; *1004*, p. 10; Pennsylvania *Bulletin 158*, p. 8; Illinois *Bulletin 81*, p. 216.

other fifty-five averaged $17, and the average for the entire eighty-six was $11. In the case of one hundred and two farmers who had used their tractors from thirteen months to twenty-four months the average annual expenditure for repairs was $34. For thirty machines which had been used from twenty-five to thirty-six months the average repairs amounted to $101.

3. *Interest costs.* — The interest cost, of course, varies according to the purchase price of the machine and the rate of interest in the community. In the case of a small tractor the cost is probably from $50 to $60 per year.

4. *Items in cost per day.* — As in the case of other kinds of machinery, the cost per day depends largely on the number of days used per year. In the case of the New York study of two hundred and fifty farms referred to above it was found that the tractors were used, on an average, fifty-four days a year including both home work and custom work.[1] A study in the Corn Belt showed the tractors, on the average, were used from forty-nine days for two-plow tractors to seventy days for six-plow tractors.[2] According to the Pennsylvania study it was found that tractors were used on an average of 50.6 days.[3]

It is considered doubtful whether in general it pays to use the tractor for custom work — that is, working for hire. Many farmers have expressed the opinion that it does not pay. Some of those who consider it profitable to do custom work fail to count all the costs, such as depreciation and interest charges. In general, if it is desirable to use a tractor it is probably wise to increase the size of the farm sufficiently to make it economical.

Outside of the costs already mentioned the principal daily charges are for fuel oil, lubricating oil, and labor. The cost of fuel will, of course, depend greatly on the size of the tractor, on the load pulled, on the kind of fuel used, and to some ex-

[1] *Farmers' Bulletin 1004*, p. 11.
[2] *Farmers' Bulletin 719*, p. 14.
[3] Pennsylvania *Bulletin 158*, p. 8.

tent on the skill of the operator. It appears that under the ordinary ratio of the prices for kerosene and gasoline the former is the cheaper fuel per day of consumption, provided the engine is so constructed as to use kerosene efficiently. In a New York study it was found that when gasoline was twenty-five cents per gallon and kerosene about ten cents per gallon, the fuel cost per acre for plowing with a tractor averaged about thirty-five cents for kerosene and eighty-seven and one-half cents for gasoline, not making any allowance for the gasoline used in warming up the kerosene engine, which does not exceed two cents per acre plowed. Lubricating oil is also an item of expense that varies according to the same conditions that influence the cost of fuel oil. The average quantity used in New York was found to be nearly one quart per acre, amounting in cost to about ten cents per acre at current prices. The cost for grease or hard oil was found to be about two cents per acre plowed.

5. *Total daily cost.* — The approximate cost per day, the overhead cost per day, and the number of horses disposed of as related to the total number of days' work per year was found in a Pennsylvania study to be as follows:

TABLE 15. DUTY AND COSTS OF TRACTORS AND NUMBER OF HORSES DISPLACED BY THEM

Days of Work per Year	Average Number of Day's Work per Year	Cost per Day	Overhead Cost per Day	Horses Disposed of
30 or less . . .	24.3	$19.97	$14.45	2.0
31 to 50 . . .	41.5	12.77	8.21	1.4
51 to 70 . . .	59.1	11.87	7.06	2.1
Over 70 . . .	84.9	9.85	4.94	2.2

6. *Normal day's work for tractors.* — What a tractor can accomplish in a day varies according to so many circumstances

that it is difficult in a brief treatment to present the facts adequately. However, one should distinguish between performance under average conditions and performance under ideal conditions. According to figures obtained in New York and Pennsylvania from actual experience of farmers it was found that the average day's plowing with two-plow outfits was 4.5 acres and for three-plow outfits, 6.25 acres.[1] The acreage covered in plowing varies considerably as between stubble or sod ground. It is estimated that from twenty to twenty-five per cent more acres will be plowed per day on stubble than on sod with the same outfit.[2]

The use of tractors as compared with horses is not especially economical for operations such as the pulling of binders where there is no economy in man labor, for in addition to the engineer it is necessary to have one man on each binder. On large grain farms where the tractor is almost exclusively used for power it is economical to employ the tractor for cutting grain rather than to keep the necessary number of horses for this purpose in addition to keeping the tractors.

QUESTIONS ON THE TEXT

1. What are the principal elements in the annual cost of keeping work horses?
2. How may the farmer avoid the cost of depreciation on his work horses? What are the disadvantages of this method?
3. What is the relation of the colts to the cost of keeping work horses? What allowance may be made for the manure?
4. What is the relation between the size of the farm and efficiency in the use of horse labor?
5. Would a tractor probably be more useful on a dairy farm than on a cotton farm? Why?
6. What percentage of the horses kept were displaced when tractors

[1] *Farmers' Bulletin 1004*, p. 14. Approximately similar results were shown by Pennsylvania *Bulletin 158*, p. 15.

[2] *Bulletin 3*, United States Department of Agriculture, p. 13.

were introduced on Illinois farms studied? On New York farms? On Pennsylvania farms?

7. "The tractor does not eat its head off when not working." How much truth is there in this suggestion?

8. What are the physical conditions most favorable to the successful use of tractors?

9. Enumerate the special advantages of tractors as compared with those of horses, other than the consideration of cost. Enumerate the disadvantages of tractors.

10. What are the principal elements in the annual cost of keeping a tractor? In the cost per day of use?

11. Discuss the comparative economy of employing gasoline and kerosene as fuel for tractors.

SPECIAL PROBLEMS

1. In Table 12 determine the average total cost per year for the six years and also the average annual cost of each main element of cost. What percentage of the average total cost is the average of each main element of cost?

2. Estimate the annual costs of keeping a work horse on the farm where you live. About how many days is each work horse used in a year? Estimate the cost per day.

3. How much would the cost per day be increased if you employed a work horse an additional thirty days each year?

4. By what methods could the number of days each horse is used on your farm be increased? Indicate the methods which you believe would pay and the methods which would not pay.

5. Estimate how much the profits on colts and the value of manure reduce the cost of keeping work horses on your farm.

6. Classify the power operations on your farm which (*a*) could not be performed by tractors; (*b*) could be performed to better advantage by tractors than by horses; (*c*) could be performed to better advantage by horses than by tractors; (*d*) could be performed either by a tractor or by a stationary engine; (*e*) could be performed only by a stationary engine.

7. Which of the operations classified in groups (*b*) and (*c*) above come at a time of year when horses kept for other necessary operations would not be very busy?

8. Would a tractor probably be more useful on a grain farm than on a dairy farm? Why?

9. Can you give reasons for the prevalent use of one-horse instead of two-horse teams on cotton farms?

10. Would the development of diversification on cotton farms reduce the advantages of one-horse teams as compared with larger teams?

11. Pioneers in regions of grain farming frequently assert that oxen are the cheapest form of power, especially in breaking prairie sod. Can you explain? The ox also seems to be advantageous in hilly regions. Why?

12. Why is the tractor not very economical for pulling grain binders? If it were found possible to get along on a large grain farm with but few horses, might it be desirable to use tractors for cutting grain?

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CHAPTER XIII

THE PLACE OF AGRICULTURE IN NATIONAL PRODUCTION

I. National wealth and resources
   1. Human wants
   2. Goods
   3. Exchangeable and nonexchangeable goods
   4. National wealth
   5. Property
   6. National resources

II. The production of wealth
   1. The nature of economic production
   2. Production and acquisition
   3. Production goods
   4. The direction of production largely determined by demand
   5. The rationality of national production determined by demand

III. Production considered from a national point of view
   1. Maintenance of productive powers
      a. Production goods
      b. Natural resources
      c. Human resources
      d. Industrial organization

IV. The place of agriculture in national production
   1. Advantages of the diversified economic life
   2. The farmer's interest in a diversified economic life

V. Foundations of a national policy for the special encouragement of agricultural production
   1. The special importance of agriculture
   2. What agricultural products should the nation produce
   3. Methods of providing encouragement to agriculture

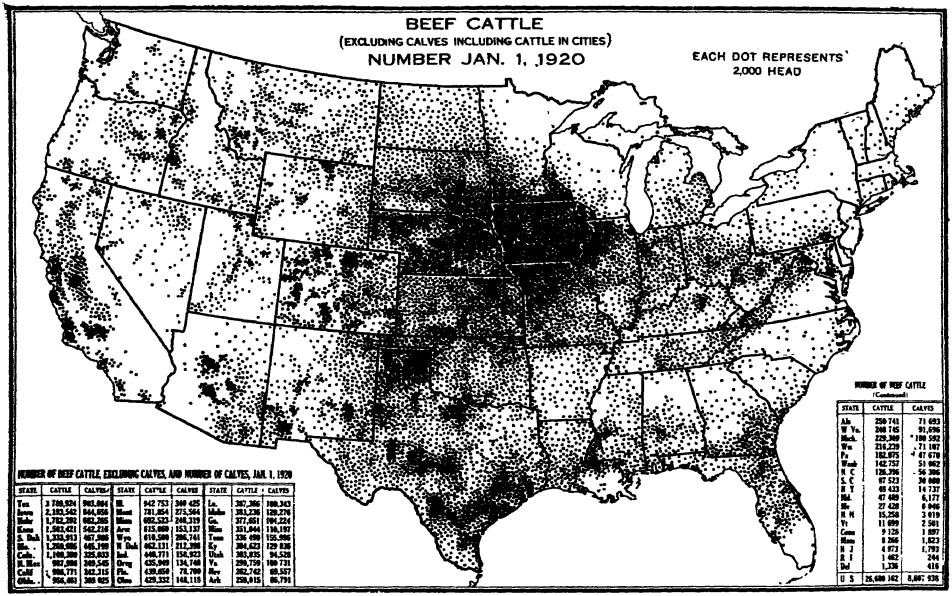
I. National wealth and resources. — 1. *Human wants.* — A large part of our lives is spent in trying to satisfy our various

wants. Civilized people have developed most elaborate and complex methods of providing for their wants, but it is characteristic of civilization that wants increase more rapidly than the means of satisfying them, so that most of us have more wants than means of satisfying them however much we may exert ourselves.

2. *Goods. — The means required to satisfy human wants are called goods.* Goods may consist either of things or of services. Some goods exist in such abundance that there is more than enough to satisfy wants, — for instance, water and air — but in modern life it is necessary to put forth effort to make even such goods available for man's use. Thus wells, waterworks, irrigation systems, etc. are required in order to make water conveniently usable.

Goods which exist in less than sufficient quantity to satisfy all human wants for them are called economic goods, and most wants are dependent on economic goods for their satisfaction. *All other goods are called free goods.* It is important to understand that the word *free* is used to mean goods that are not scarce. Some economic goods are free in the sense that there is no charge made for them — for instance, parks. Nevertheless, parks do not exist in abundance by nature but must be created by man's effort.

3. *Exchangeable and nonexchangeable goods.* — Most economic goods are exchangeable one for the other and come to have a value in exchange. For the most part, such goods are property and as such are capable of being acquired. Other goods are not for sale — that is, nonexchangeable. This may be because the goods are owned by the state and therefore are not for sale — as, for instance, schoolhouses. Again, goods may be nonexchangeable because by existing custom they are incapable of exchange. For instance, the labor of the housewife is a service that satisfies important human wants, but it is generally not customary to sell this labor. When these services



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FIG. 39. — NUMBER AND DISTRIBUTION OF BEEF CATTLE

Beef cattle constitute slightly over half the total number of cattle in the United States. The corner tables give figures of beef cattle and of calves on farms only; there were 890,963 in cities and villages.

are sold, as in the case of cooks and waitresses, the services become exchangeable goods.

4. *National wealth. — If we could make a list of all the goods in existence in the nation at a given moment we should have what may be regarded as national wealth.* It would consist of farms and houses, factories, machinery, ships, live stock, railways, etc. It would not include services, for these do not exist as a stock of goods but come into existence and go out of existence, leaving behind certain effects, it is true, but the effects are not the services.

If we should try to measure this gigantic total we should have to do so in terms of dollars or some other monetary unit. The trouble is that the total value measured in money will at times tend to increase rapidly or to decrease rapidly when no important change has occurred in the volume of goods. For instance, because of the rapid rise of prices during the recent war, the total amount of our national wealth expressed in dollars increased by many billions, but there was no corresponding change in the volume of goods making up the real wealth of the nation.

5. *Property. — Property may be defined as the legal control enjoyed by the owner over goods and services either present or future.* It may take many forms with reference to the same goods. For instance, a farm is goods, yet with respect to the same farm there may be several kinds of property. One may own the farm; another may hold a mortgage on it; a third person may have a lease on it which is a valuable right; a fourth may have an option to buy it, and, if the value of the farm has increased since the option was given, this option will be a valuable right; and so on.

The value of property is largely due to the income which the property yields or may be expected to yield. This income may be in dollars, or it may consist of services. For instance, if one owns a dwelling house and lets it to others, the income from the

house is in the form of money; but if one lives in it the income is in the form of services, pleasures, and benefits derived from using the house.

We may distinguish between national wealth and national property. *National wealth is the stock of economic goods in a nation at a given time. National property is the valuable rights to goods which are owned by the nation, whether by the government or by the people of the nation.* Thus the American Government or the American people may hold property rights to goods which are now in Germany or in France. On the contrary, some of the goods which are now in this country may be owned by citizens of other countries.

6. *National resources.* — If we should attempt to measure the economic welfare of the nation we should be very wrong if we considered only the stock of goods in the nation or even the value of the property owned by the government and people of the nation less debts owed to other governments and peoples. In the first place, some of the goods which we own are hurtful, for instance, whiskey. In the second place, we should have to leave out some very important things upon which the welfare of the nation depends — for instance, the productive powers of the nation, which include national intelligence, skill and experience, good order, morality, and industrial organization. These are very important sources of the nation's economic welfare. For instance, the extreme poverty of Central Europe to-day is not so much due to the fact that there was a very great loss and destruction of goods during the recent war but far more to the great destruction and demoralization of the productive powers of the people. Many of the most skillful and experienced leaders were killed, the political order was greatly disturbed, the morale of the people was definitely lowered, and the industrial organization and system of business and production were seriously demoralized.

We may, therefore, employ the term "resources" to designate

all the forms of national wealth, as well as other conditions which contribute to the economic efficiency of the nation.

II. The production of wealth. — 1. *The nature of economic production.* — *In economics "to produce" means to create by human activity the means of satisfying economic wants — that is, economic goods and services.* Let us consider for a moment some of the elements of this definition.

a. Production involves human activity. Even the savage who finds food growing on a bush has to go to the trouble of pulling it, not to speak of the trouble of finding it.

b. The word *create* has been subject to much misunderstanding. For instance, it is often said that the farmer is the only producer, for he alone creates new goods. The falsity of this idea will be clear when we consider some of the functions involved in production.

Physicists tell us that after all we do not create any new matter; we merely change its form and location, putting it in new combinations. The farmer prepares soil, plants seed, cultivates and harvests the crop. His human activity, intelligently directed with the aid of natural forces and materials, results in the production of wheat, cotton, corn, etc. The manufacturer is doing similar work. He takes certain materials and with the aid of natural powers changes their form, shape, and size, putting them in new combinations, and his activity has transformed these materials into cloth, stoves, flour, and other goods capable of satisfying human wants.

It is sometimes said that while both farmers and manufacturers are producers, the former are more productive than the latter because they receive more aid from nature. It should be recognized, however, that the manufacturer is aided at every point by nature. He employs steam, electricity, the force of gravity, cohesion, contraction, and the action of chemical forces.

Agencies that change the place of things so as to make them more capable of satisfying wants are also productive. For

instance, the railway, the dray, and the steamboat are engaged in carrying goods from places of production to the places where they will be consumed.

Promoting the exchange of goods is also productive activity. Nowadays, goods are produced by specialization. One man produces wheat; another produces flour; a third produces bread; a fourth produces cotton; a fifth produces cloth; and so on. Not only are people specializing on one kind of product, but the same concern or firm has frequently divided up the process of production into many minute parts performed by separate individuals. This specialization has resulted in greatly increasing the total product. However, in order that this specialization may be carried on it is necessary that provision be made for exchanging the goods which are produced. This process of exchanging goods has also come to be performed by specialized agencies, and these agencies must be credited with contributing to production.

Storage agencies also promote the satisfaction of human wants. Many crops are produced only once a year and must be held until the time comes to consume them. For instance, eggs are produced in large quantities for a few months in the year, and it is desirable to hold them until the months of scarcity.

There are also many agencies engaged in performing personal services, such as doctors, lawyers, artists, actors, bootblacks, barbers, and a host of others. In so far as these agencies are satisfying reasonable wants they are also to be regarded as productive.

2. *Production and acquisition.* — Men may engage in activity which merely results in taking wealth from others without increasing the total stock of economic goods available for human consumption. Extreme examples of such men are the burglar and the successful gambler. As a matter of fact, most economic activity results in some kind of service to others even though the service may be purely incidental to the process of taking wealth from others. For instance, even the speculator in the

produce exchanges, while largely engaged in trying to acquire wealth for himself, incidentally performs certain useful functions in stabilizing the market and in providing a continuous market for the products. (See Chapter XXIV.)

It must be admitted, however, that in our present economic life there are many ways in which people are able to acquire far more than the services they contribute are worth.

3. *Production goods.* — Much of our activity in production consists in the creation of goods that are not of themselves capable of satisfying our wants but which ultimately make possible greater results in want satisfaction than would be possible without this aid. For instance, we can dig a ditch by hand aided only with simple tools, light plows, shovels, and pick-axes, or we may use a dredging machine. Now the dredging machine is a very much more indirect method. It involves mining the ore, smelting it, and preparing the various metallic parts which go into the machine. In order that the ore may be mined and the metallic parts formed, other machines must previously have been made, which, in turn, trace back to previous processes of mining, smelting, lumbering, etc. In short, we have some production goods to produce still other production goods, to produce still others, and so on, but the ultimate end is the goods that will satisfy human wants.

It follows from the above that the ability of a nation to produce depends largely upon the number and quality of its production goods. For instance, we may note how crippled Europe now is in its economic activity partly because large quantities of production goods, such as factories, ships, railways, and mines, have been destroyed.

4. *The direction of production largely determined by demand.* — What determines how much land will be planted to wheat, how much to corn, and how much to cotton? Who decides how much labor will be devoted to manufacturing woolen cloth and how much to manufacturing cotton cloth, etc.? It is a very

complicated process to trace all of the causes that have brought about these results, but we can say that in the long run it depends largely on the demand for various kinds of goods and services.

Let us suppose that it becomes suddenly so fashionable to ride bicycles that a much larger number of people than at present demand bicycles. The present stock of bicycles would be found inadequate. The competition of buyers would probably result in an increase of retail prices for bicycles. Since retailers bought the bicycles at the former wholesale price the retailers' profits from the sale of bicycles would greatly increase. They would demand more from the wholesalers, and, since the wholesalers also have a limited stock of bicycles, their prices will rise so that they, in turn, will find the sale of bicycles unusually profitable and will try to get more from the manufacturer. The latter will probably increase the price of the stock on hand, and if the manufacturers believe the sudden demand will continue they will speed up the production of their factories. Since a large part of their expense is overhead and has to be met in any case, the larger volume of production will probably for a time be produced at a comparatively low cost per unit while salable at especially high prices. This will mean unusual profits for the manufacturers. They, in turn, will demand a larger amount of raw material such as steel, rubber, and leather. If the demand continues to increase it may become necessary to enlarge the factories. This will mean increased machinery, larger buildings, and more laborers.

Now the increased demand for bicycles has not only resulted in an increase in the amount of labor, production goods, and materials used in making bicycles but has probably reduced the amount used for other things, for at a given time we have only so much labor, materials, etc.[1] As the saying is, "We can't have our cake and eat it too."

[1] Of course, if there has previously been considerable unemployment, this above statement is open to some modification.

A great many economic fallacies are based on failure to recognize this principle. One of these fallacies is the idea that if people spend their money freely, they are public benefactors because they make times good. It is true that if a stranger comes into a town and spends his money freely he may help the business in the town, especially if he does not care how high a price he pays. But from the standpoint of the nation as a whole, if a man spends his money freely for consumption goods, he is merely consuming that much of the common store. The essential point is that when money is spent it is usually spent to purchase either production goods or goods for consumption. If for the latter purpose, the goods will be consumed by this individual instead of by some one else. If this individual and others increase the demand for consumption goods until it is greater in proportion to the demand for production goods than it was before, fewer production goods will be produced, and therefore in the long run there will be fewer goods to consume.

5. *The rationality of national production determined by demand.* — If demand largely determines what will be produced it follows that whether we produce foolishly or wisely depends largely on whether we spend foolishly or wisely. Who controls our national expenditures? The national government spends part of it; likewise, governments of states, counties, and cities spend a large part. Part is spent by various public institutions endowed by private benefactors. However, the greater part of our national income is spent by private individuals. How these individuals spend it is partly determined by the distribution of wealth. Since rich people indulge different tastes from those that are indulged by the poorer classes, it follows that if the distribution of income were more nearly equal than it is at present, incomes would be spent in a different way. It does not necessarily follow from this that a more equal distribution of income would result in a more rational expenditure judged from a national standpoint. The wealthier classes are largely re-

sponsible for expenditure in production goods, for the incomes of very wealthy people are so large that even if they live very luxuriously, they still find it necessary to save and invest productively a large part of their incomes. The poorer class of people frequently spend very wastefully. A radical change in the distribution of wealth and income in the direction of greater equality should go hand in hand with development of more intelligent and thrifty habits of expenditure on the part of the poorer classes.

What we produce is also determined in part by what other peoples and governments demand of us. For instance, the demand on the part of European governments for war supplies brought about a great change in the character of our industry during the war.

III. Production considered from a national point of view. — The primary interest of the nation is to maintain security and to promote the general welfare of its population. Welfare depends so much on security and order that the nation as a whole must permit nothing to interfere with the maintenance of this security. Moreover, the nation is not only concerned with the security and welfare of the people living to-day but also with the security and welfare of future generations.

It is on the basis of these principles that the nation is justified in pursuing a special policy with respect to national production instead of leaving its character to be determined wholly by demand, as described above.

1. *Maintenance of productive powers.* — Everything depends on maintaining and enlarging the productive powers. Even from the standpoint of national defense this is vitally important, for modern warfare taxes the productive abilities of a nation to the utmost.

a. Production goods. — The stock of production goods is largely brought into existence as the result of that part of the demand for production goods which results from saving and

investment. Therefore, it is important to promote and safeguard saving and investment.

b. Natural resources. — Natural resources, such as harbors, rivers, forests, soil, and mineral deposits, are important productive powers. We shall be dependent on these productive powers for security and welfare centuries hence. At a given time it may pay individuals to make wasteful use of these precious resources, but the nation must look to the future as well as to the present.

c. Human resources. — One of the most important bases of security and prosperity is the people of the nation. Both the number and the character of the people are important for national defense. However, a large population does not alone make a nation powerful. For instance, China is not a formidable world power in spite of the fact that its population is four times that of the United States. The health, intelligence, skill, and morality of the people are of even greater importance than numbers.

d. Industrial organization. — A modern nation is much more than a body of land, people, and production goods; it is a complex organization. Centuries have been required to develop these complex relationships. Russia may again be used to illustrate the chaos that results from the sudden destruction of the established political, religious, and civic relationships of human society. We are so accustomed to these established relationships that we frequently fail to realize the importance of the habits of order, the established security, and the rules of conduct worked out through long experience and experiment without which life would be chaos. Imagine, for instance, the confusion in a city if the traffic rules were suddenly suspended and the disorganization of our legal relations if our court records were destroyed.

Many people are inclined to consider the government only a tax-gathering agency which imposes contributions which we are reluctant to pay and for which we receive little or no benefit,

but a brief enumeration of some of the things which the government does for us reveals the fact that government is after all indispensable to securing the things that make modern life worth while.

IV. The place of agriculture in national production. — If we choose, we can adopt policies which will result in the employment of a much larger per cent of our productive powers in agriculture than would be so employed if conditions were left to take their natural course. On the other hand, we might so encourage other kinds of industry and neglect our agriculture that we would become dependent on other countries in large part for our food and raw materials.

1. *Advantages of the diversified economic life.* — If it is true that a wholesome national life depends on the maintenance of a substantial rural population, it is no less true that an efficient national life as well as the conditions most favorable for a prosperous agriculture are to be found not in a purely agricultural section or nation but in a nation or a section with a well-balanced system of agriculture, industry, and commerce.

Let us consider some of the disadvantages of a nation which is wholly agricultural.

a. From a military standpoint such a nation has a sparse population and lacks the mechanical resources necessary to fight a successful war. These were the weaknesses of the South in the Civil War.

b. A purely agricultural section, if accessible to transportation facilities, must ship its products to a foreign market and is, therefore, subject not only to the heavy transportation costs of its products but also to the uncertainty of war and foreign tariffs, and it is equally dependent on foreign countries for mechanical equipment and supplies other than the products of the farm. In those parts of a purely agricultural region which are not accessible to transportation it is possible to develop only a rude self-sufficing economy.

c. A sparse population makes for the absence of many of the things that are necessary for a complete community life — good roads, schools, churches, various kinds of entertainments, etc.

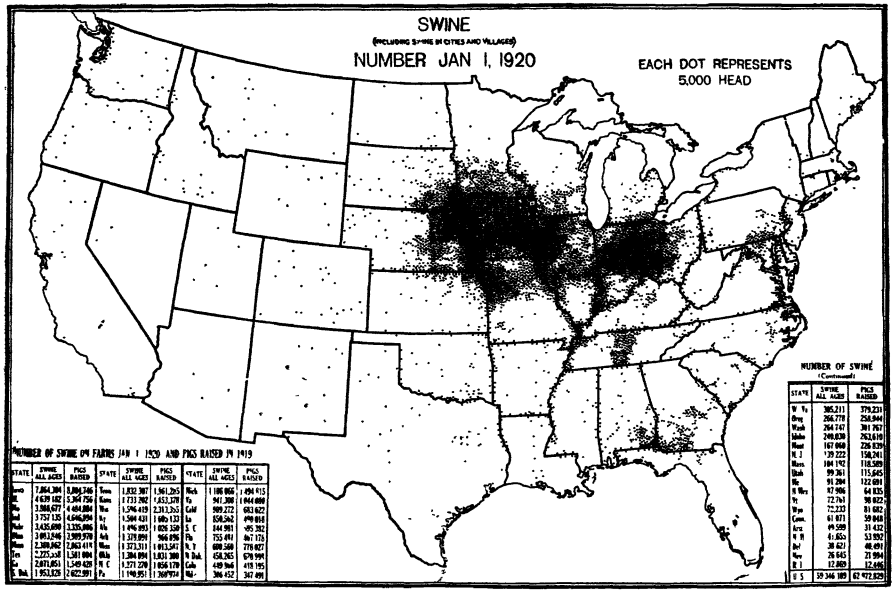
d. In such regions there is little opportunity for the development of talent and genius, for the only outlet of these talents is the single industry of agriculture.

e. In such a nation or region it is impossible to develop adequately transportation facilities so as to make the fullest use of all the national resources, especially of such bulky products as the ores, clay, stone, and lumber.

2. *The farmer's interest in a diversified economic life.* — To some extent the relation of the farmer to industrial and commercial agencies appears to be one of antagonism of interest involved in the sale of his products and the purchase of the things he needs. There can be little question that farmers frequently get the worst of it in these exchanges. However, in seeking to maintain his position in the economic struggle with other economic classes in the community the farmer should not forget the great advantages which he enjoys by reason of the existence of these other classes.

V. Foundations of a national policy for the special encouragement of agricultural production. — Although certain nations which are still largely agricultural are now confronted with the problem of diversifying their economic life, the United States has gone so far in this direction that many fear that agriculture may be displaced to too great an extent by urban industries. England with an urban population of about eighty per cent has been for some time deeply concerned by this condition. Not only in England but in most of the other civilized nations of the world, we find a tendency toward the development of policies for the special encouragement of agriculture.

1. *The special importance of agriculture.* — There is a great deal of vagueness at the present time as to how much the nation



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FIG. 40. — NUMBER AND DISTRIBUTION OF SWINE

Over two fifths of the hogs and pigs were in the Corn Belt. Swine in cities and villages comprised about 4 per cent of the total number in the United States.

should do for the special benefit of the farming class. Some friends of the farmer would set no limit to their demands, placing the interests of the farmer ahead of those of all other classes. On the other hand, there are many business men and politicians who fail to recognize the vital relation between the progress and prosperity of farming and the welfare of the nation as a whole. It is important, therefore, to consider why agriculture should be given special consideration and encouragement.

a. Agricultural products furnish the food for the nation and much of the raw material for other industries. In time of need we could do without diamonds and picture shows, but food and raw materials, such as cotton, wool, hides, lumber, and minerals, are the vital bases of life and industry. It may be cheaper to import these things, but it may be very costly to be without them in time of war. Austria is seriously handicapped because it has not these vital sources of industry.

b. It has long been believed that farm life produces certain qualities in the population essential to national strength and greatness.

In part, this conclusion has rested on the assumption that country life and activity make for physical strength, endurance, and health. In fact, Germany was so sure of this that she pursued special policies to encourage the development of a large peasant population, believing the countryman to be a better fighter than his city cousin. This point, however, is not so clear as was formerly believed. In the first place, vital statistics show that the farmers are not so superior physically to city dwellers and that the city is rapidly surpassing the country as a healthful place to live.[1] In the second place, experience in modern war seems to show that city dwellers frequently are as good fighters as countrymen.

[1] For a comparative summary of health conditions in city and country, see Vogt, Paul L., *Introduction to Rural Sociology*, Chapters VIII and IX; Gillette, *Constructive Rural Sociology*.

The importance of a large rural population to national welfare has also been based on mental qualities of the rural population. It has been held that country life develops such qualities as self-reliance, independence, adaptability, and conservatism; that a rural population is less subject to immoral influences than city population; that country life is a better environment for young people to grow up in, partly because of the better moral conditions and partly because it provides wholesome interests and the work is of a desultory character which fits in with the shifting interests of the child; that rural life is favorable to family life and organization because it puts a premium on early marriage and large families and because the children are closely associated with the parents in the work of the farm; and finally, that a large proportion of the successful men of the United States come from the country.

Some of these claims rest on facts; others are largely fanciful. Statistics show that marriage occurs earlier in the country; that the average number of children per family is larger than in cities. Also the rural death rate is somewhat lower than the urban, but cities are rapidly catching up as a result of improvements in sanitation. Moreover, the superiority of the country in this regard is largely due to the heavier infant death rate in the cities.

It is true that a large proportion of the successful men of the United States have come from the country, but it is natural that, since our cities have largely grown up on the basis of the people drawn from the country districts, a large proportion of successful men in the cities should have been born in the country. Furthermore, men of ability are attracted from the country to the city since most of the opportunities for achievement are to be found there. In the case of France, statistics gathered by Odin showed that a very much larger proportion of the eminent literary men of that nation had been born in cities than had been born in rural districts. This does not mean that

people born in the country are any less capable of achievement than people born in cities but merely that the educational opportunities of cities are more favorable to the intellectual development which makes possible literary accomplishment.

Immorality is more apparent in cities because it is segregated and also because criminals of the cities are made up not only of people born in the city but also of persons of criminal tendency who have come from the country.

As to the mental qualities of city dwellers as compared with dwellers in the country, one's conclusions are likely to be derived from comparing certain classes in the city with certain other classes in the country. We are too much inclined to select the comfortable middle class in prosperous regions of the country to compare with the squalid and degraded people of the slum districts, losing sight of the ignorance, poverty, and immorality to be found in large areas of the country. Undoubtedly, cities have better educational conditions, and consequently cities are centers from which flow the streams of progress.

c. Another consideration is the greater freedom from radicalism believed to be characteristic of rural, as contrasted with urban, areas. It is held that the city breeds agitators and discontented people who seek to overthrow the established order of things. While farmers in America have been radical at times in contrast with the conservatism of the capitalist class, — as, for instance, in agitations for "cheap" money — in nearly every country farmers have been the bulwarks against the more radical socialist and anarchist movements.

While it is difficult to find a substantial support for the idea that rural life is peculiarly superior to city life, we may conclude that a large rural class is a wholesome and desirable element in the national population. However, what proportion of rural population is desirable must remain a matter of opinion. In fact, it is probably easier to determine the safe minimum of

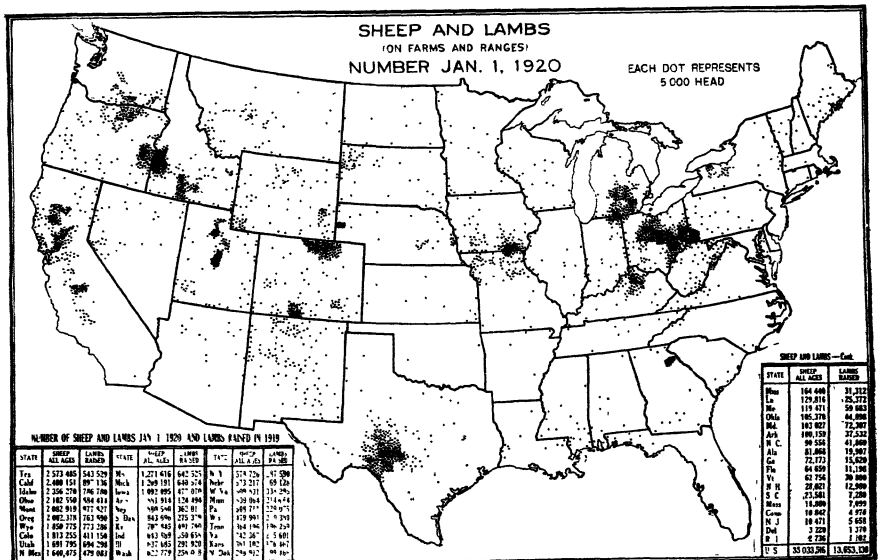
rural population on the basis of the essential needs of a nation for food and raw materials rather than on the less tangible basis of moral and intellectual grounds.

2. *What agricultural products should the nation produce?* — To what extent should we depend on importation from other countries for the agricultural products which we consume, and what should we produce at home?

First, we may consider the economic conditions which explain our present imports. It is obvious that we import a considerable number of agricultural products simply because we do not have conditions of climate or soil suitable for their production in the United States, as, for instance, cocoa, rubber, cocoanut oil, bananas, and the fiber known as sisal, used in making binder twine. It is also probable that coffee, jute, lemons, hemp, cane sugar, and other products may be added to this list. Although we have a few areas capable of producing them, either conditions are less favorable for their production in this country or the areas available for their production are not sufficiently large to provide fully for the needs of the nation.

There are certain other important products for which we have fairly good physical conditions of production but which can be bought more cheaply abroad because they require a large amount of labor in proportion to the value of the output and can be produced more cheaply in countries where wages are very low. Included in this group are silk, flax fiber, and tea. Perhaps rice and sugar beets may be added to this list, for both industries in this country have been developed through the aid of protective tariffs.

We import small quantities of certain commodities which we also export in large quantities. Our imports are attributable to the fact that we do not produce here the particular quality of the product needed for certain purposes or do not produce enough to satisfy the total demand in this country. Thus while we produce far more tobacco and cotton than is



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FIG. 41. — NUMBER AND DISTRIBUTION OF SHEEP AND LAMBS

Over 60 per cent of the sheep and lambs graze on the arid lands of the western half of the United States. The dense spots in the West are owing in part to the date of enumeration, when many sheep are being fed in the irrigated districts and in part to the enumeration of sheep in that county in which the owner resides.

consumed in this country, we import Sumatra "wrapper" tobacco and Cuban "filler" tobacco for fine cigars; and we purchase from Egypt long staple cotton for use in manufacture of automobile tires and for other purposes. Similarly, although we export large quantities of wheat, we also import it from Canada because some of our consuming markets are quite near the Canadian grain fields.

Some people assume that we should produce everything for which we have favorable natural conditions. For instance, from time to time we have had agitations for the production of raw silk, disregarding the fact that we can buy it much more cheaply than we can produce it. It does not necessarily follow that we should produce all we use of a particular commodity, even though the conditions of production are as favorable here as in other countries. After all, we have only a limited supply of land and labor available. Sometimes the production of a certain product may require the use of land or labor which can be more profitably employed for some other product, as, for instance, in the case of corn in the Cotton Belt.

The prevalence of the idea that we should produce in this country as much as possible of what we use largely grows out of the idea that by so doing we thereby keep our money at home. It should be clear, however, that even if keeping our money at home were desirable, this end is not accomplished by merely producing at home what we hitherto bought abroad. Suppose, for instance, that we undertake to produce the sugar which we now import from abroad. Generally this would have to be accomplished by using labor and capital which was formerly employed for producing other commodities. Let us suppose that all of this labor and capital was formerly employed for producing rice. If, then, we no longer produce the rice, we shall have to buy it abroad if we continue to use it. Consequently the result is that now our money goes abroad to purchase rice instead of going abroad to purchase sugar. The

result of the change is probably to employ our labor and capital less productively than formerly without having achieved the object of keeping our money at home. It is, of course, conceivable that we might produce the sugar at home instead of buying it abroad and employ for the purpose of producing the sugar labor and capital which we have hitherto used to produce some product which we have been exporting, for instance, wheat. This would be a movement in the direction of becoming entirely self-sufficient as a nation, neither buying nor selling abroad. It is clear, however, that by so doing we lose all the advantages of national specialization and exchange. In fact, it is important to realize that in the long run if we continue to sell abroad we must also expect to buy, and this is especially so now that we have become a creditor nation with large sums of money due us for interest and repayment of indebtedness, for the rest of the world must pay such indebtedness in the form of goods rather than in the form of money.

As already noted, the military, as well as the economic, point of view must be considered in determining what the nation should produce. Up to the present time this question has been probably less important in the case of the United States with its immense area than in the case of small and crowded countries, such as Holland, Belgium, England, and Japan. Indeed, some of the commodities which we now import — such as coffee, cocoa, tea, fruits, and nuts — are either luxuries or semi-luxuries. Other commodities such as rice, vegetable oils, silk, and flax are useful, but partial substitutes are probably available in time of need. We produce scarcely one fourth of the sugar we consume but in case of need could probably get along with a greatly reduced supply. Our imports of sisal for binder twine, of wool, and of hides are peculiarly important but probably not at present indispensable.

It is, therefore, probable that the United States is still capable of providing for its vital needs if it were entirely cut off from

all imports. However, there are reasons for believing that with the large increase in population that will probably occur during the next few decades, the problem of maintaining a secure supply of agricultural products will become a serious one.

3. *Methods of providing encouragement to agriculture.* — Available methods of encouragement to agriculture may be divided into two great groups. In one group we may include methods of encouragement which involve supplementing what the farmers would earn if left to themselves. By subsidies, bounties, or protective tariffs we may enable people to engage in the production of things which would otherwise be unprofitable. The second group comprises methods of making farm production more efficient. The first kind of encouragement can be employed to develop the industry beyond its normal amount but does not necessarily make it more efficient. The second method can be justified irrespective of the question as to how many of our people should be engaged in agriculture, for whatever number is so engaged it is to the nation's interest that their energies be as efficiently used as possible.

a. Protective tariffs for agriculture. — To what extent is it desirable to employ tariffs to encourage agriculture? It is sometimes asserted that there is no use in putting a protective tariff on products which we export, for we are not likely both to export and to import the same product; the very fact that we export the product indicates that we have already produced enough for our own consumption. In a large measure this is true. However, there are certain modifications of the principle. In the first place, there are sections of the country near the boundary line which may suffer from the competition of foreign products even though the greater part of the country is able to produce and export a surplus of the same products. In the second place, while a country may in ordinary years be able to export a surplus of its product in competition with foreign countries it may be desirable to protect

the industry against dumping — that is, temporary underselling — on the part of foreign producers. For instance, it may be that one year in ten a foreign country will have such a large crop that it will have to export it to our market in order to dispose of it and at such low prices as to injure temporarily our producers. It is not desirable that an industry which normally can hold its own should be demoralized by these occasional and temporary instances of underselling.

One of the strongest arguments for a protective policy is known as the "infant industry argument." This argument assumes that sometimes, when an industry is young, it is not able to stand alone against foreign competition and needs protection until it achieves maturity as an industry. It is obvious, however, that this argument assumes that protection should be taken away when the industry reaches maturity, for if it is an industry which can never stand alone it is probably undesirable to start it at all.

Closely related to this argument for protection is the argument that protection may promote a diversified national industry. We have seen that it is clearly desirable that a purely agricultural nation should encourage the development of a diversified national industry.

Another argument that has been used frequently to gain political support for protective policies is known as the "labor or wages argument." This is a double-barreled argument. On the one hand, it is held that protection makes wages high. Again, it is sometimes said that because wages are high we must have protection against the cheap labor of foreign countries. It is clearly inconsistent, however, to protect our industries against the products of cheap labor and also to keep the gates open for such cheap labor to emigrate to this country. Real protection to American labor consists in shutting out low-valued foreign labor. The fact is that a country with high wages does not need protection in order to keep its laborers at work, al-

though it may need protection to keep them at work in certain kinds of industries in which a relatively large amount of labor is required. High wages in this country represent not industrial disadvantages but industrial advantages due to abundance of national resources, the excellence of our national organization, and the skill and efficiency of our laboring classes.

There is one sense, however, in which wage earners probably benefit by protection. If foreigners should undersell the industry in which these laborers are employed, the laborers would be thrown out of work and would lose the advantages of the special skill which they have developed. This is more of an argument, however, for antidumping tariffs than for regular protective tariffs.

Nations are not always able to avoid resorting to protective tariffs, for the aggressive actions of other countries may make it necessary. Protection may sometimes be needed as a weapon of retaliation against countries which pursue a hostile policy against our own exports. It constitutes a basis for bargaining in our relations with other nations.

It must also be recognized, of course, that these economic principles are modified by military considerations.

It has already been suggested that in the case of agriculture there are other kinds of encouragement which are more important than tariffs. The employment of large resources in investigation and encouragement of more efficient methods; the provision of suitable credit facilities; and the development of proper conditions of land tenure, economical arrangements for marketing products, and businesslike methods of farm organization create permanent superiorities in production.

It is sometimes said that farmers should not receive these encouragements at the expense of the general public. It must be remembered, however, that such encouragement is justified on three grounds. In the first place, farming is a small-scale industry composed of millions of producers who find it difficult

to maintain and bring about for themselves these special advantages which large businesses can provide without outside assistance. To a considerable extent farmers by coöperation are overcoming this handicap, but it is necessary for the government not only to help farmers, but to help them to help themselves. In the second place, other kinds of industry receive many governmental favors either directly or indirectly, including special advantages in banking arrangements and the benefit of protective tariffs. Third, we have already noted that agriculture is basic not only to our life but also to our other industries.

QUESTIONS ON THE TEXT

1. Why do civilized people find it impossible to satisfy their wants in spite of great progress in methods of production?
2. Define economic goods, free goods, exchangeable goods, non-exchangeable goods; illustrate each.
3. Does an increase or a decrease in the total value of the goods in a nation measure a corresponding change in the total amount of national wealth? Why?
4. Does national wealth consist only of things owned by the government? Explain.
5. Does part of the national wealth consist of claims to goods in other countries? Are part of the goods in this country not a part of national wealth?
6. Show that there may be several kinds of property in the same good.
7. Is there any relation between the income from property and the value of the property?
8. Distinguish between national wealth and national property.
9. Give illustrations of goods which are a part of the national wealth but not part of the nation's resources because they are injurious. Give illustrations of goods which are part of the nation's resources but not part of its wealth.
10. Define economic production.
11. Are farmers the only producers of wealth? Is there reason to believe that a farmer contributes more to the production of wealth than does (*a*) a factory hand; (*b*) a locomotive engineer; (*c*) a merchant; (*d*) a college professor; (*e*) an actor?

12. Compare the farmer with each of the classes mentioned in question 11 from the standpoint of who contributes more to the nation's resources.

13. Give illustrations of forms of economic activity which are (*a*) acquisitive but not productive; (*b*) productive but probably yield too much return to the producer in proportion to the productive service; (*c*) productive but yield insufficient return for the service rendered.

14. What are production goods? Illustrate. Show the importance of a large stock of production goods to national efficiency in production.

15. Would a sudden doubling of the demand for cotton cloth result immediately in a corresponding increase in acreage planted in cotton? Why?

16. Is there any connection between how wisely you spend your money and how wisely the nation's productive resources will be used? Why?

17. What are the principal elements in the productive power of the nation?

18. Mention the general advantages of a diversified national life. What are the advantages to the farmer?

19. On what grounds could the claim be supported that the country breeds a more desirable type of people than does the city?

20. On what basis can a national policy for the special encouragement of agriculture be justified?

21. Classify our agricultural imports from the standpoint of the reasons why we buy them abroad rather than produce them at home.

22. Is it possible that a nation may import a product even when it can be produced at less cost at home? Explain.

23. If we produce at home what we hitherto have imported, does this result in "keeping the money at home"? Explain.

24. Mention various ways by which the nation may give special encouragement to agriculture.

25. What are the principal arguments for and against employing tariffs to encourage production?

26. Are tariffs the best means of giving special encouragement to agriculture?

SPECIAL PROBLEMS

1. If the United States should abandon its claim to the debts due this government by European nations, would this comprise a decrease in the national wealth? In the government's property? In the nation's productive resources? Explain your answers.

2. Might there be private property consisting of rights to goods or services which do not yet exist? Illustrate.

3. Would the value of a kind of property which yielded an income worth $1,000 per year be as great as if the income were $2,000 per year (assuming in each case that the income is perpetual)?

4. Suppose you had the chance to buy either of two pieces of property, one of which would begin immediately to yield an income of $1,000 per year for three years, while the other would begin to yield such an income five years from now; which piece of property would be most valuable? Why?

5. Suppose you had a chance to purchase an oil well which would yield a net income of $1,000 a year for ten years or to purchase a farm which would yield an average net income of $600 a year forever, which would you consider the more valuable property? Explain.

6. Trace the steps by which a sudden increase in the demand for woolen cloth would result in an increase in the production of wool. What other things would probably be more largely produced as a result of the increase in the demand for woolen cloth?

7. "A spendthrift is a public benefactor because he makes times good." Criticize.

8. Is the fact that a nation exports more than it imports — that is, has a "favorable balance of trade" — more advantageous than if the opposite were the case? Explain.

9. What is the total value of the agricultural exports of the United States? Of the agricultural imports?

10. What are the principal agricultural products which we export? Which we import?

11. What changes have occurred during the last year in the exports of (*a*) wheat and wheat products; (*b*) live stock and live-stock products; (*c*) cotton?

12. What agricultural products are now subject to a protective tariff?

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CHAPTER XIV

SUPPLY AND VALUE OF LAND AS A FACTOR OF PRODUCTION

I. Definition of land
II. Differences between the supply of farm land and the supply of other factors of production
III. Sense in which farm land is scarce
IV. Grades of land
V. In what order do the different grades of land come into use
VI. Reservation of lands from use
VII. The supply of agricultural land in the United States
VIII. Possibility of expanding the area of farm land
IX. Conditions that determine the amount of land that may be used
    1. Under self-sufficing economy
    2. Under commercial farming
X. Value of land
    1. The annual use value of land, or economic rent
    2. The conditions that make the economic rent high or low
    3. Distinction between economic rent and contract rent
    4. Capital value of land

I. Definition of land. — *Economists have been accustomed to use the term land to include all primary resources supplied by nature.* In this sense farm land is only one of a number of important classes of land, such as forest land, mineral land, or city land. Moreover, it is important to recognize that economic conclusions that apply to farm land and the resulting land policies might not properly apply to other kinds of land.

II. Differences between the supply of farm land and the supply of other factors of production. — Economists have

been wont to say that the supply of land differs from the supply of other factors of production, such as labor and capital, in that the supply of land is practically limited by nature, while the other factors are capable of increase by man. If we take into consideration the total amount of land in the world, whether used or unused, this is approximately true, but if we have in mind the present supply — that which is actually used — we find the peculiarity of the supply of farm land to be that it is not all used, for large areas of land either are not employed at all or are employed for forests, grazing, and other uses.

III. Sense in which farm land is scarce. — Farm land is scarce in a different sense than labor is scarce. We use practically all of our labor in some way or other irrespective of quantity, but we use only certain grades of land for farming. Sometimes the failure to use it is due to some condition that prevents men from employing the land, such as the presence of Indians, the fact that it is purposely held in reserve by the State, or because its existence is not yet known, awaiting geographic discovery. Unless such causes prevent, the failure to use land is generally attributable either to lack of sufficient demand or to the poor quality of the land. In other words, at a given time it may not pay to use certain land and it certainly does not pay to use for farming all the land that might be so employed.

Some people attribute the high prices of food to the scarcity of land, whereas the amount of land used is limited by the supply of labor and capital available for farming. (See Chapter II.) Bringing more land into use than is justified by existing conditions tends to lower the prices for agricultural products and results in losses to those who bring the new land into use, as well as to those already engaged in farming.

IV. Grades of land. — Common observation shows that land differs greatly in serviceability for use. The following list suggests some of the important conditions determining the serviceability of land for agriculture:



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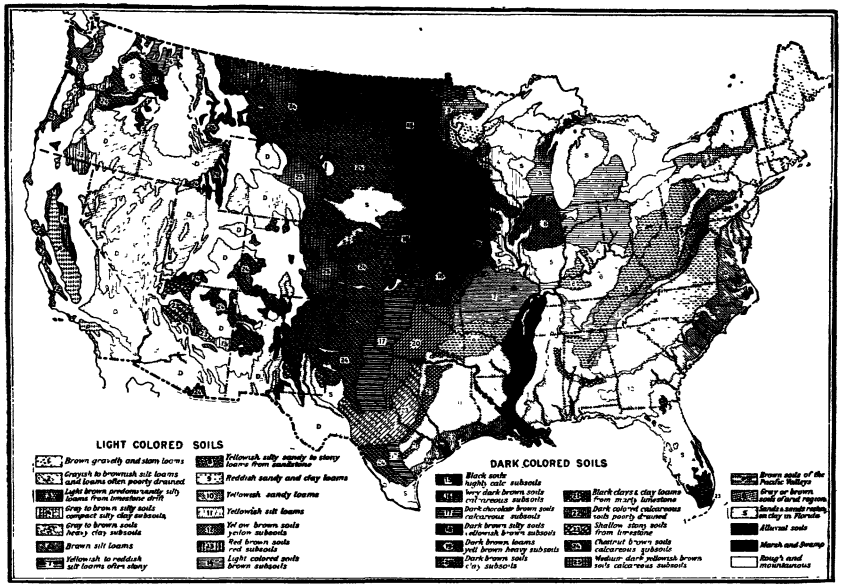
FIG. 42. — LAND RELIEF OF THE UNITED STATES

This map shows the topography of the United States in a generalized way. The map fails to show the high altitude of much of the West, particularly of the Rocky Mountain and arid intermountain plateau regions.

1. Soil fertility and texture
2. Topography
3. Temperature — especially length of the growing season
4. Rainfall — not only annual average but also seasonal distribution, variability from year to year, rate of evaporation, etc.
5. Presence or absence of insect pests and diseases affecting plants and animals — for instance, the boll weevil
6. Healthfulness of land for people who work or live on it
7. Presence or absence of obstacles to use, such as excessive moisture requiring drainage, excessive dryness requiring irrigation, stumps, trees, brush, stones, etc.
8. Accessibility to market — that is, distance to centers of ultimate consumption, nearness to local markets, condition of roads, transportation facilities and rates
9. Social conditions — kind of neighbors, church and school facilities, etc.

Sometimes land that is inferior because of some of these economic and social conditions but has natural advantages may become superior when the social and economic conditions have changed or when physical obstacles, such as excessive moisture, stumps, and timber have been overcome.

V. In what order do the different grades of land come into use? — If there were no obstacles to the use of land, if men and capital moved freely from place to place, and if men were always capable of judging what is good, we should expect that the better grades of land would be first used and then the next best and so on. Perhaps we may say that to a large extent the land that is best, considering all the conditions and qualities mentioned above, is first used. Thus when the first settlements were made in America, probably some of the land employed was not so fertile as that later opened to settlement, but the lack of fertility was more than balanced by the absence of Indian enemies, by the nearness to ocean transpor-



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FIG. 43. — SOIL REGIONS OF THE UNITED STATES

Soils originally or at present covered with forest are normally light colored and are likely to be less fertile than soils in regions of lower rainfall.

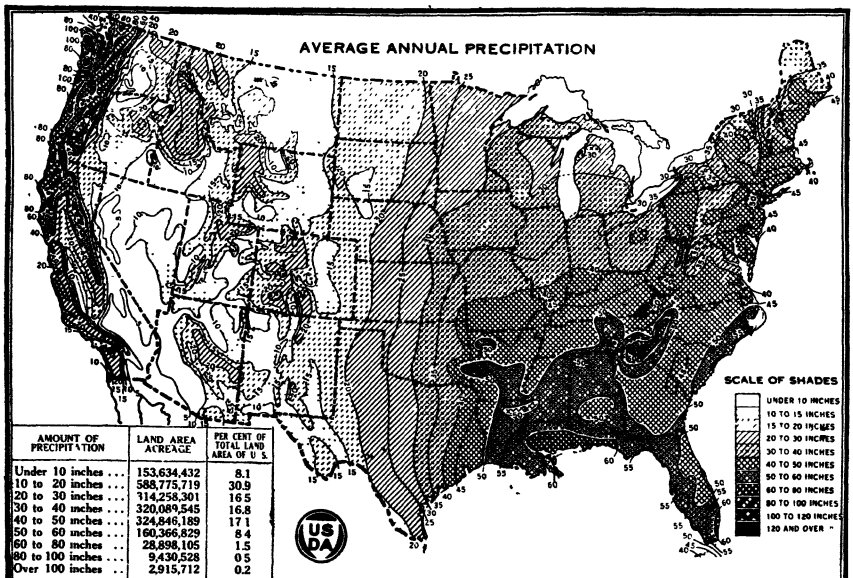
tation and to centers of consumption. Gradually, however, these artificial conditions affecting the desirability of land have been removed by the elimination of Indians, the building of railways, and the development of home markets.

While land has not come into use in the past altogether in accordance with its quality, when one considers alone its physical productiveness, it is probable that any future extension of the farming area of the United States must involve using land which is inferior in soil or climate or which can be used only after heavy expenditures for draining, irrigating, or clearing of trees, stumps, and other obstacles.

VI. Reservation of lands from use. — In general, since the formation of our government, there have been few restrictions on the use of land for agriculture. While the government has never thrown all of its land open to private use at any one time, it has made more of it available for use than could be used at a particular time.

It is sometimes said that private owners of land withhold land from use in order to gain by its increase in value or from other motives. To some extent this is true. This question cannot be fully discussed until after the conditions determining the value of land have been studied. Some agricultural lands, especially in England, have been used by the owners as hunting preserves and private parks; but the area involved is relatively very small.

VII. The supply of agricultural land in the United States. — The total land area of the United States is approximately 1,903,000,000 acres. Of this amount, however, it is estimated that about 1,000,000,000 acres can never be used for the profitable production of crops, because of poor soil, rough topography, lack of rainfall, etc. Some land is also characterized by such infertile soil that it probably will never be used, and there are other areas unprofitable for present use but which may be used in the future.



AMOUNT OF PRECIPITATION	LAND AREA ACREAGE	PER CENT OF TOTAL LAND AREA OF U. S.
Under 10 inches ...	153,634,432	8.1
10 to 20 inches ...	588,775,719	30.9
20 to 30 inches ...	314,258,301	16.5
30 to 40 inches ...	320,089,545	16.8
40 to 50 inches ...	324,846,189	17.1
50 to 60 inches ...	160,366,829	8.4
60 to 80 inches ..	28,898,105	1.5
80 to 100 inches ...	9,430,528	0.5
Over 100 inches ..	2,915,712	0.2

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FIG. 44. — AVERAGE ANNUAL PRECIPITATION

Precipitation includes rain, melted snow, sleet, and hail. The map is much reduced and generalized.

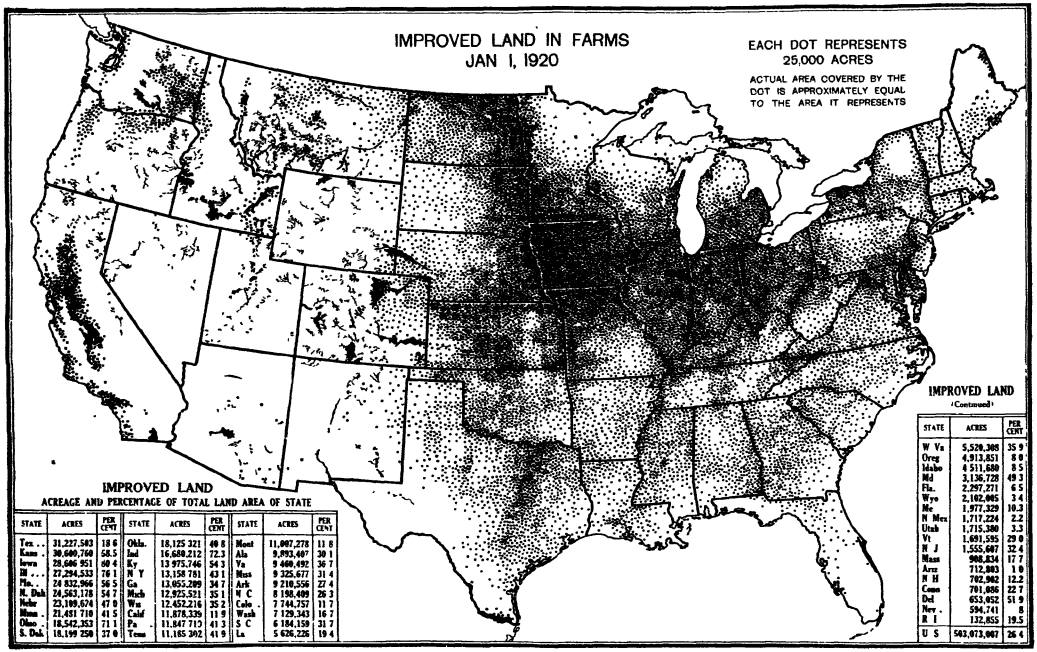
The accompanying maps, Figures 45 and 46, show for the United States the area of improved land in farms and also the area of land not in farms. A careful study of these maps will give one an idea of the extent of the area in the United States which cannot be counted on for future cultivation. It should be noted, however, that of this billion acres which probably is not capable of being used for cultivation, there is only about 40,000,000 acres that it is believed cannot be used either for grazing or for forests or for both uses combined. Of the remaining 900,000,000 acres approximately 800,000,000 is now either used for crops or it is believed may at some time be so used, the remainder comprising land in towns and cities, highways, railway rights of way, and other nonagricultural uses. In 1920, the total improved land in farms comprised 506,982,301 acres.

It may be estimated that there is in reserve less than 300,000,000 acres of land capable of being used for crops at some time in the future. It must be strongly emphasized, however, that the greater part of this land cannot be profitably employed for farming until the demand for land becomes so great that it will pay to spend large sums in drainage, irrigation, clearing, or fertilization.

VIII. Possibility of expanding the area of farm land. — If there is need for the expansion of farm production it may occur in any one or more of four ways.

1. *Without using any more labor, capital, or land we may make a more efficient use of these factors of production.* This, of course, involves the development of new methods of production and the education of our farmers in the use of better methods.

2. *Without using any more labor or capital we may employ more land.* This may be done through the opening up of new areas making it possible for the same amount of labor and capital to operate a greater area of land — that is, to operate more



IMPROVED LAND
ACREAGE AND PERCENTAGE OF TOTAL LAND AREA OF STATE

STATE	ACRES	PER CENT	STATE	ACRES	PER CENT	STATE	ACRES	PER CENT
Tex. .	31,227,583	18 6	Okla.	18,125 321	40 8	Mont	11,007,278	11 8
Kans .	30,600,760	58.5	Ind.	16,680,212	72.3	Ala	9,893,407	30 1
Iowa	28,606 851	60 4	Ky	13 975,746	54 3	Va	9 460,492	36 7
Ill . . .	27,294,533	76 1	N Y	13,158 781	43 1	Miss	9 325,677	31 4
Mo. .	24 832,966	56 5	Ga	12,055,209	34 7	Ark	9 210,556	27 4
N. Dak	24,563,178	54 7	Mich	12,925,521	35 1	N C	8 190,409	26 3
Nebr	23,189,674	47 0	Wis	12,452,216	35 2	Colo .	7 744,757	11 7
Minn .	21,481 710	41 5	Calif	11,878,339	11 9	Wash	7 129,343	16 7
Ohio .	18,542,353	71 1	Pa	11,847 713	41 3	S C	6 184,159	21 7
S. Dak	18,199 250	37 0	Tenn	11,185 302	41 9	La	5 626,226	19 4

IMPROVED LAND
(Continued)

STATE	ACRES	PER CENT
W Va	5,520,308	35 9
Oreg	4,913,851	8 0
Idaho	4 511,680	8 5
Md	3,136,728	49 3
Fla.	2,297,271	6 5
Wyo	2,102,995	3 4
Me	1,977,329	10.3
N Mex	1,717,224	2.2
Utah	1,715,380	3.3
Vt	1,691,595	29 9
N J	1,555,607	32 4
Mass	980,834	17 7
Ariz	712,803	1 0
N H	702,982	12.2
Conn	701,686	22 7
Del	653,852	51 9
Nev .	594,741	1
R I	132,855	19.5
U S	503,073,987	26 4

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FIG. 45. — IMPROVED LAND IN FARMS, Jan. 1, 1920

extensively. If the land has been scarce before so that it had to be farmed very intensively and subject to diminishing productivity, the opening up of new areas of good land may result in a great expansion of production without the employment of more labor and capital per unit of product, or such a method of expansion may be made through new mechanical devices enabling the same labor and capital to work a greater amount of land.

3. *By using more labor and capital on land already in use.* If the land has already been used up to the point of diminishing average productivity per unit of expense, it is clear that this method results in a smaller production per unit of expense — that is, in an increased expense per unit of product. (See Chap. X.)

4. *By bringing more land into use through employing larger quantities of labor and capital per unit of land.* This method will result in a smaller product per unit of labor and capital employed and, therefore, in an increased cost per unit of the additional product.

Economists speak of the third method as "lowering the intensive margin of cultivation" and of the fourth method as "lowering the extensive margin of cultivation."

It is important to recognize that to a large extent the two methods are used simultaneously. When it is necessary to increase the total product, some labor and capital will be employed in putting new lands into cultivation, and if this new land is inferior to that previously used, labor and capital will also be employed in working the old land more intensively than before.

Land which is so poor that it will return to those who use it barely enough to pay the cost of using it is called marginal land. Land which is so poor that it will not pay the cost of using it is called submarginal land, and land which is good enough to yield more than the cost of using it is called supermarginal land.

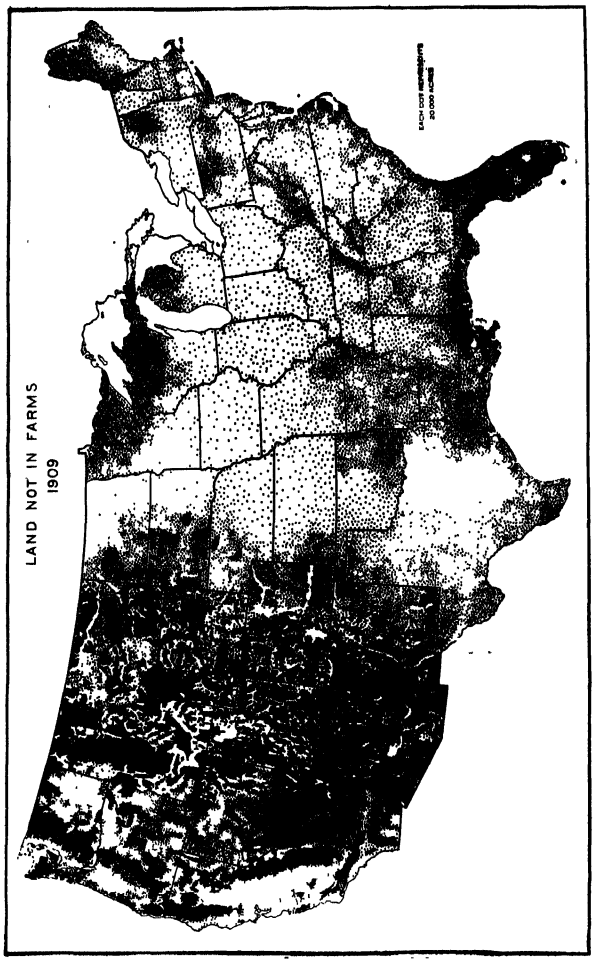
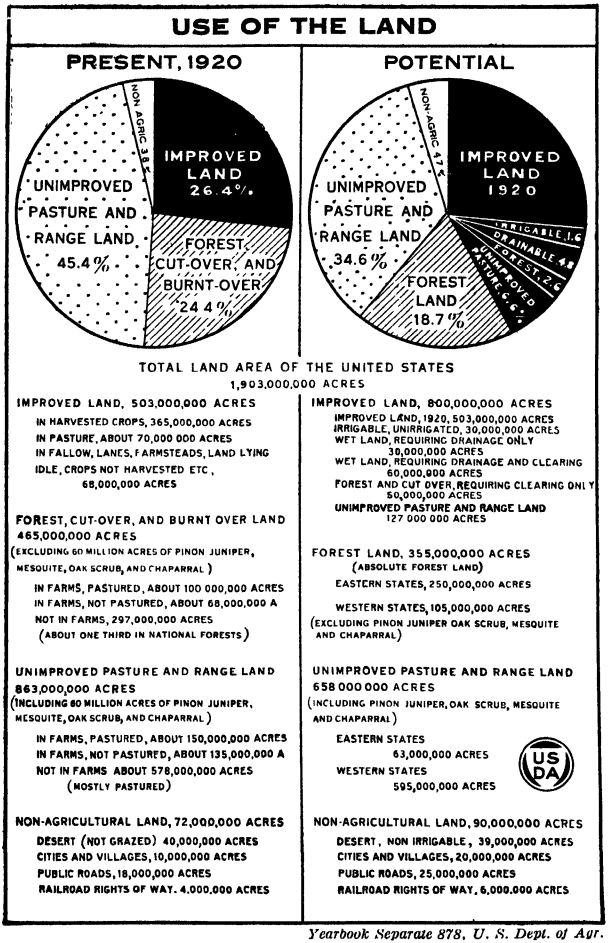


FIG. 46. — LAND NOT IN FARMS, 1909 *Yearbook for 1916, U. S. Dept. of Agr.*

The large areas of land not in farms are principally in mountain regions, in regions of deficient rainfall, or consist of wet lands and lands requiring clearing of trees and stumps.

IX. Conditions that determine the amount of land that may be used. — 1. *Under self-sufficing economy.* — When a farmer is not producing for the market to any great extent but is merely trying to raise enough for his own living, it is clear that the conditions under which he will use land are quite different from those which would govern his actions if he were producing for market and were considering the question of making a profit on his investment. Under the conditions of self-sufficing economy there is little or no money expense involved in production. Markets and location with respect to markets are comparatively unimportant considerations. Since products are not raised for sale or exchange but only to provide the family food, a comparatively small area per family is required. Therefore, land may be selected because of its defensibility, water supply, and availability of timber rather than for productive qualities. In America many new regions have passed through this stage of development, but the motives in selecting land have not been entirely those just described, for the pioneers have looked to the future, expecting to become commercial farmers. Some, however, with purely self-sufficing intent have settled in the mountains and elsewhere and have continued to farm land which really would not pay under commercial conditions.

2. *Under commercial farming.* — If the aim of the farmer is to carry on farming for a profit, he must have reason to expect that the use of the land will pay enough to cover the expenses of using it, including a sufficient return above other expenses to induce the farmer to engage in and to continue in farming, even though there is practically no return for the use of the land after these other expenses are paid. This does not mean that the farmer will pay nothing either to rent or to buy the farm, for if it is improved he may need to pay for the improvements, although he pays nothing for the land. Moreover, even if the land without the improvements has no value for



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FIG. 47

It is physically possible to increase the area of improved land about 300 million acres, or 60 per cent, by irrigation, drainage, clearing, fertilization, and dry farming.

present use the expectation that it will have a value in the future may give it a speculative value now as distinguished from a use value.

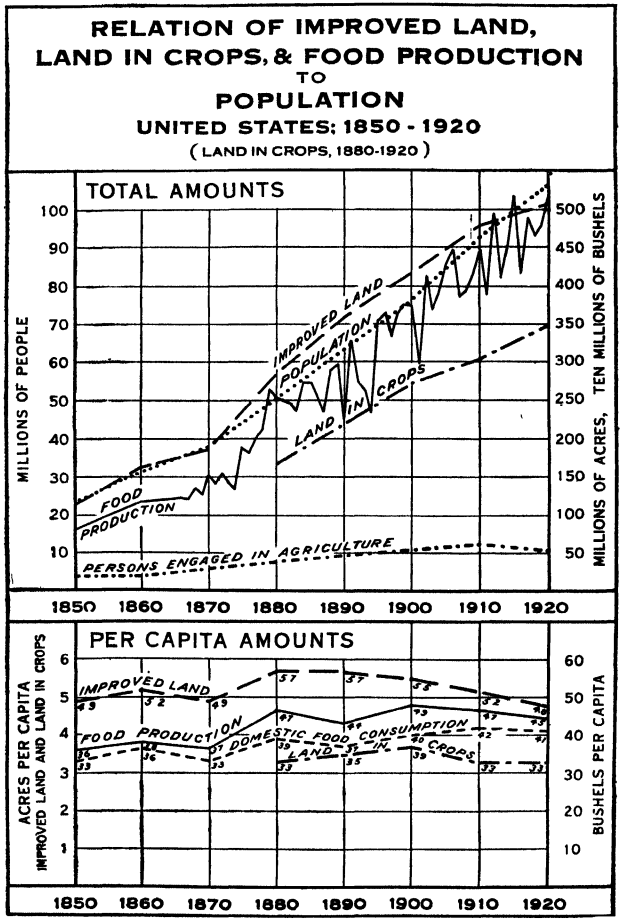
If land is brought into use when the return from using it will just cover the cost of using it, a rise of prices of agricultural products, provided expenses do not increase in greater proportion, will make it possible to increase the amount of land in use, for some of the land which formerly did not pay enough return to cover expenses may now be used.

Likewise, any condition that lowers the expense of using land in proportion to the return from it will also make it possible to employ land which formerly would not pay and to work the land already in use more intensively than before. For instance, the introduction of Japanese and Mexican labor in some sections makes it possible to work the land more intensively than it could be worked by the higher-priced American labor and also to use land that Americans could not afford to employ on account of its poor quality.

Some of the expenses of using land include the investment in durable expenses, such as clearing, draining, building houses, fences, or barns. It is clear that in a time of high prices expenses may be incurred in the expectation that the high prices will be permanent. If the prices fall again, the land may continue to be used even though it would not pay at these prices to use it if it had to be cleared, drained, or irrigated anew.

Submarginal land is sometimes used by mistake. Not only city people but also many farmers are deceived as to the quality of land. When farmers get out of the particular section with which they are acquainted, it is easy for them to make mistakes in buying or taking up land.

X. Value of land. — 1. *The annual use value of land, or economic rent.* — We have seen that some land is in use which yields a money product larger than the expense of employing it under the usual conditions of efficiency and skill of the com-



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FIG. 48

In recent decades, total population has increased more rapidly than improved land, crop land, food production, and population engaged in agriculture.

munity. Moreover, every one knows that there is some land in most communities that will return a larger product for a given amount of expenditure than will other land in the same community for the same amount of expenditure. Let us suppose that a certain kind of land will yield on an average one year with another $30 return per $10 expense on each acre. The remainder above expense is attributable to the use of the land and is known as *economic rent.* From another point of view, it is the surplus the farmer has by employing his $10 on this land rather than by employing it on marginal land, or land that it just pays to use. It also measures how much he is ahead by employing his $10 on this land rather than by employing it in working other land more intensively, when such intensive operations yield just enough additional product to repay the $10 expended in producing it.[1]

2. *The conditions that make the economic rent high or low are as follows:* —

a. All the conditions that determine the superiority or inferiority of farm land (see page 236).

b. Whatever makes prices of farm products high or low in proportion to expense. (See Chapter XXV.)

c. It is believed that the efficiency of farmers also has an influence on use value of land due not only to the tendency for the best farmers to pay more for the best farms in order to obtain them than their less efficient neighbors can pay but also

[1] Economists will recognize that in this discussion it has seemed desirable for the sake of simplicity to avoid attempting to explain the measuring of rent from the extensive margin of cultivation. The writer believes that elementary students are likely to be confused by the relationship of the two methods of measurement — from the intensive and from the extensive margins — especially as the conclusion that the same result is derived from either method represents only a tendency and not an equivalence that necessarily exists and involves suppositions as to the perfection of the competitive process which it is hard to make clear to the elementary student.

to the fact that superior farmers are able to make more profit relatively than they themselves could make on the poorer lands.[1]

d. Improvements in methods of farming which are confined to a given locality or region are likely to result partly in a higher return to the landowner and partly in higher wages of management or profits for the farmer. If, however, these improvements are general rather than confined to a single locality or region they are likely to result in a lower value of farm products, thus transferring some of the benefit to consumers.

3. *Distinction between economic rent and contract rent.* — What we call rent in ordinary language is what a man agrees to pay the owner of a farm in order to obtain the use of it for a year. It is important to note that this is essentially different from what we have called economic rent, for even cash rent, which resembles economic rent most closely, is different in important respects. In the first place, cash rent includes a payment for the use of buildings and fences as well as for other improvements, such as clearing and ditching, while economic rent is from land alone. It also includes a payment for satisfactions, such as home building, social advantages of the community, good schools and churches, while economic rent is only the net income due to the use of the land alone. If share rent is paid, it includes the landlord's risk of small crops and low prices for his share of the crop. (See page 289.) Moreover, the economic rent is not necessarily a payment but exists whether the owner of the land lets it to another or works it himself.

In spite of these differences, that part of the contract rent which represents payment for the use of the land alone tends through competition to be equivalent to economic rent. If tenants will not pay the use value, or economic rent, enough

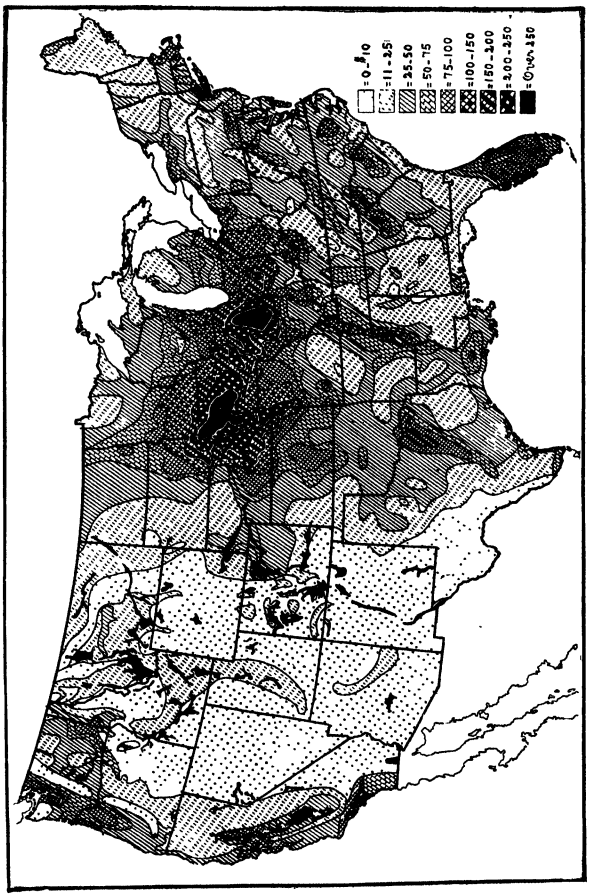
[1] For fuller explanation see H. C. Taylor, *Agricultural Economics* (New York, 1919), pp. 192–198.

landlords may themselves use their lands to create a scarcity of rentable land, forcing tenants to pay more.

4. *Capital value of land.* — When a man purchases land, he obtains the right to use it or control the use of it for his own lifetime and to transmit this right to his heirs or to sell it to others — in other words, he buys the annual uses forever. The value of this right we shall call the capital value, as distinguished from the annual use value, or rent. We shall now consider what it is that makes the capital value high or low.

In the first place, whether the economic rent is high or low will have much to do with determining whether the capital value will be high or low. Commercial farmers buy farms partly as homes but mainly to make money from them. Therefore, they will pay most for the farm that will annually yield the most money. Other things being equal, one would pay more for a farm that will earn $1,200 a year in addition to other expenses than he would pay for a farm of the same size that will earn only $400 per year.

The real question, however, is how much will be paid for each of these farms? Supposing a farm earns on the average $1,200 per year, what is it worth to the purchaser? Buying a farm is in reality a method of investing capital, and the rent which the farm earns is the return on this investment. If one purchased a farm under no other consideration than the making of an investment, one would consider carefully whether the rent which the farm will earn will pay a return on the purchase price equivalent to what might be obtained from the investment of the same amount of money in other safe investments, such as good bonds or farm mortgages. If, for instance, the land buyer can obtain five per cent for money invested in mortgages or bonds, he might consider that he must obtain at least this much for an investment in farm land. Now, if the land yields $1,200 rent per year, this would comprise interest on $24,000 at five per cent — that is, $1,200 capitalized



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FIG. 49. — AVERAGE VALUE OF FARM LAND, JAN. 1, 1920

The high land values of the Corn Belt are conspicuous. The irrigated areas are also shown on the map as having land values of over $250, but this is not true of all the districts.

at five per cent equals $24,000. If, however, the farmer is not willing to buy land unless he can earn ten per cent on his investment, he would be willing to pay only $12,000 for a farm yielding an average rent of $1,200 per year.

In any given district various buyers will be competing for land. Some will be willing to buy land at a lower rate of capitalization than will others. In general, those with the lowest rate of capitalization will be able to outbid those with higher rates. As a result of this competition between buyers there will prevail in the community a certain rate of capitalization at which land sells.

It is important to note that the value of the land is determined by its rent and not its rent by its value. Sometimes people argue that because they have paid $24,000 for a farm, they should receive a certain rate of interest in rent. If they consider that a fair rate of interest is six per cent, they assume that the land should rent for $1,400 per year. However, what one pays for land does not determine what the land will earn each year, but rather what the land will earn each year determines what one should pay for it. The fact that one pays too much in purchase price does not mean that the land is worth this much any more than a "gold brick" is worth a thousand dollars simply because one has made the mistake of buying it.

However, the rate of return on the value of farm real estate by no means corresponds to the rate of return on sound investments, such as mortgages and bonds. In some counties in Iowa, for instance, the average price of land is so high that the rent which it can earn is only about two per cent of the price of the land. On the other hand, in certain counties in Arkansas the average cash rent is found to be thirteen per cent of the average price of the land. For the nation as a whole the average was found to be about 3.5 per cent in 1920.

How may we account for the widespread (though not uni-

versal) tendency for the capital value of land to be so high that the percentage of annual return will be much lower than the prevailing rate of interest on other safe investments? One explanation is that farmers have a certain pride in the ownership of a good farm just as they like to own a pure-bred horse and may sometimes pay more than the use value alone would justify merely to satisfy this pride of ownership. Still another reason is that many farmers do not consider other forms of investment. They have no other thought than to put their savings into the purchase of a farm rather than to invest it in some other way. Furthermore, when they buy a farm they buy not only a place in which to live but all that goes with this, including nearness to relatives, friends, and acquaintances and to church, school, and other institutions with which they are familiar. Frequently, peasants buy land not from an investment standpoint but as a place to live and work and be independent of a landlord. Furthermore, they are often accustomed to a low standard of living and to hard conditions of labor and are willing to work harder and longer for a given return than will American farmers. In certain parts of Europe, especially in England, the ownership of land carries with it a considerable amount of social distinction. This has led people to pay higher prices for land than ordinary investment principles would justify.

One of the most important conditions, however, which causes a low rate of return on land is the expected increase in the price of land. In buying land one purchases not only the right to receive its annual rent but also the right to an expected increase in rent and price of the land. Naturally, allowance is made in the price paid for the expected increase. In the United States from 1850 to 1920 the increase in the price of land averaged two per cent compound interest to the owners on the original purchase price. If one could know that the land would continue to increase in price at this rate, one could afford

to buy it at a price which would make possible a return of less than two or three per cent in rent.

The trouble is that when one buys this expected increase in price one is speculating. It is no use to say that land prices have always increased, for, while this has generally been true, there have been considerable periods of time in certain sections of the United States when it has not been true.

In periods when land prices are rapidly rising, the interest of speculators is attracted to the buying and selling of land as a means of making quick profits, and as a result there is likely to occur what is popularly called a "boom." Under the influence of this speculative excitement land prices are likely to be carried very much higher than the permanent earning power of the land justifies.[1]

QUESTIONS ON THE TEXT

1. Since there is far more land in the world, and even in the United States, than is now employed for agriculture, in what sense may we say that agricultural land is scarce?
2. What are the principal conditions that determine the serviceability of land for agricultural production?
3. Are the better grades of land, all things considered, likely to be first used in the development of a new country? Is the most fertile land first used?
4. Is the land in the United States not yet used for farming good or poor in quality? In fertility?
5. What was the area of land in the United States in farms in 1920? What was the area of improved land? How much additional land can probably be used for crops when the need for it is sufficiently great? How much land can probably never be used either for crops, grazing, or forests?
6. What are the four ways by which the productivity of farm land may be increased? Explain each one.
7. What is meant by the intensive margin of cultivation? What is the extensive margin?

[1] For a statistical study of a farm-land "boom" see "Farm-Land Values in Iowa," by L. C. Gray and O. G. Lloyd, *Bulletin 874*, United States Department of Agriculture.

8. Which of the four methods of increasing production mentioned above can be effected without increased cost per unit of product?

9. What are marginal land, submarginal land, supermarginal land? May land be submarginal for crops, but supermarginal for grazing or forests?

10. How do the considerations that determine the choice of land for farming differ in self-sufficing agriculture and in commercial agriculture?

11. If a considerable rise should occur in the values of farm products, would it become profitable to use some of the land which is now supermarginal?

12. Could people willing to work for very low wages use poorer land than could people who require higher wages? Could the former class pay more for land than the latter could pay for the same kind of land? Why?

13. What is meant by the economic rent of land?

14. What are the conditions that make it high or low?

15. Why is it that contract rent is not always exactly equal to economic rent?

16. Is the capital value of land, that is, its value for purchase, dependent on the rent that it will yield, or is the rent dependent on the value? Explain.

17. What is meant by the rate of capitalization, and how does it influence the value of land?

18. What are some of the reasons why the percentage of rent to the value of land is very much less than the rate of return on the value of other kinds of equally safe investments?

SPECIAL PROBLEMS

1. What was the acreage of farm land per capita in 1850, 1910, and 1920? What was the acreage of improved farm land at these three dates?

2. What was the increase of population from 1910 to 1920? Of land in farms? Of improved land in farms?

3. Calculate the increase of farm land and of improved farm land for each person added to the population. How does this compare with the acreage per capita in 1910?

4. How many additional acres of farm land and of improved land would be required to maintain the same acreages per capita in 1950 as in 1920 if population increases at the same rate as it did from 1910 to 1920?

5. Name the regions in the United States where there are large areas of land not in farms. What physical conditions are responsible in each region?

6. A certain grade of land will yield a product of $73 per acre when cultivated according to the accepted methods of farming and the proper degree of intensity. The expense is $82 per acre. Is the land supermarginal or submarginal?

7. Suppose fifty per cent of the above expense is for man labor and that labor could be obtained for thirty per cent less wages, would the land still be submarginal?

8. Under the conditions of problem 7, what is the economic rent of the land?

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CHAPTER XV

LAND TENURE

I. Important changes in the development of land tenure
   1. Tribal and communal control of land
   2. The village system
   3. The manorial system
   4. Transformation of the manorial system
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   6. Tenure conditions in other European countries
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By "land tenure" we mean not only the legal conditions under which men own, occupy, and use land but to some extent, also, the economic and social relations.

In the course of history very great changes in these relations have occurred, so that at present land tenure is very different from that of earlier ages.

I. **Important changes in the development of land tenure.** — 1. *Tribal and communal control of land.* — Such sources of information as are available indicate that among many peoples there was a time when tribes and clans did not look on land as property in the sense in which we know the term but considered it largely as something to be used in common.

2. *The village system.* — When they settled down more or

less definitely to agricultural life, the peoples of Western Europe, as well as Aryan races in other parts of the world (as in India and Russia), developed a form of land tenure which we may call the " mark " or " village " system.

In the early village, as it prevailed in Germany and England, it is probable that all or nearly all of the land was regarded as belonging to the village, rather than to families or individuals. The people worked the fields jointly, and certain individuals were appointed to look after the stock and perform other services. Gradually, each head of a family came to possess a certain amount of land and the crop raised on it. However, this holding involved only the right to use the land but not to sell it or otherwise dispose of it.

The family holding was not in a compact body but was in thirty or more scattered strips, each about an acre in extent. The meadowland was also divided up for hay cutting, but after harvest, the families of the village pastured their stock in common both on the hay land and on the plowland. All pasture and woodland were used in common by the people of the village, and the work of looking after the stock, keeping up fences, and other similar tasks were carried on by persons selected by the village. The system of holding plowland in scattered strips in open fields is called the open-field or common-field system to distinguish it from our modern system of holding land in a compact body. Obviously under the common-field system all farming operations had to be carried on by a common plan, and the individual farmer was not free to employ any new methods.

3. *The manorial system.* — Long before the Norman Conquest in England the village system was being gradually changed into the manorial system. There had developed a feudal nobility who controlled a large part of the land. A large proportion of the farmers hitherto freemen had become dependents or tenants, holding their lands of the lords in return for various

services. Moreover, many were gradually losing their personal independence. These tendencies were greatly intensified by the Norman Conquest.

Sometimes a manor corresponded in area to a vill or village, or again it might include several villages. There were also instances when there were several manors to a single village, which was still, and continued to be for many centuries, the unit of agricultural organization. The manor was the unit of the lord's control and administration, particularly for the collection of taxes and the administration of justice.

Gradually, however, as the central government absorbed more and more the political authority formerly exercised by the lord and as the manor became a source of money income and the land capable of being bought and sold, the lords came to regard the land more and more as property and less as a political estate.

The plowland and meadowland of the manor were divided into two classes — the demesne land and the tenant land. Both classes of land were intermingled in the scattered strips already described. The demesne land was farmed directly by the lord or his representative with the aid of servants or slaves, and the labor contributed by the tenants as rent for their holdings. Pasture lands continued to be used in common for the stock of the lord and of the tenants.

There were several classes of manorial tenants, the most important being the villeins. The villein owed to his lord various obligations. He must work on the demesne land several days a week (week work) and also do extra work at special times or on special occasions (boon work). He must also pay gafol, or tribute, consisting of money or fixed quantities of corn, poultry, eggs, or other products. There were various other dues payable on special occasions.

In theory, the villein held his land at his lord's will and subject to whatever terms the lord might impose. The con-

ditions were fixed rigidly by custom and changed little. In reality, the villein, though bound to the soil, enjoyed permanence of tenure, for, even if the lord should sell his estates, the villein's right to his holdings continued unchanged. The various payments and obligations due by the villein to his lord were not merely payments for the rent of the land but also by virtue of the fact that he was not free — that is, he was his lord's "man"; not in the same sense as a slave, for he was subject to the protection of the law of the land as to life and property.

In addition to the villeins, there were several other classes in the manor, including the freemen (liberi homines) and the soc-men.

4. *Transformation of the manorial system.* — In practically all European nations the manorial system has gradually given way to more modern forms of land tenure, but the transformation occurred much more recently in some countries than in others. In England, for instance, the changes were gradual, covering nearly eight hundred years. On the other hand, in Germany the principal changes occurred after the middle of the eighteenth century, while in Russia the greatest changes occurred after the middle of the nineteenth century.

5. *Modern conditions of land tenure in England.* — As a result of the changes which followed the break-up of the manorial system, England became a country of landlords and tenants. In 1900 only about fourteen per cent of all the land in crops and grasses in England was farmed by the owners of the land, and even this small proportion was farmed mainly by large landholders, while eighty-six per cent of the land was farmed by tenants. In 1875, it was found that about one half the land of England was owned by about five thousand owners, none of whom had less than 1,000 acres. Hundreds owned 20,000 acres or more each. The tenant farmers of England are not small farmers largely doing their own work but em-

ploying farmers operating by means of hired laborers working for wages and dependent on others for employment.

6. *Tenure conditions in other European countries.* — For the most part, land tenure on the continent of Europe is in severe contrast to the English conditions just described. A large proportion of the farmers are peasants, and there is a much smaller proportion of large employing farmers than in England. Moreover, in some of the countries a large percentage of the farmers have title to their farms, though frequently subject to mortgages. Peasant farmers generally farm very intensively. Their farms are very small, so small in fact that the labor of the entire family is necessary to make a living. On such small farms it does not pay to employ modern power machinery. Judged from the standpoint of the labor cost of farm products, peasant farming seems exceedingly wasteful, and it was formerly common for English economists to condemn the peasant farming of the continent for this reason. However, some are coming to believe that peasant farming is not without its advantages, especially when the condition of the peasant is compared with that of English hired laborers. For the peasant is not dependent on another for a job and has a permanent home. Many of the disadvantages of small farming have been overcome by coöperation.

In France and Belgium the small size of peasant farms is partly due to the law of inheritance known as the law of equal partition, which provides that land shall be divided into as many equal parts as will make one share for each child, besides one or more shares for the widow. The result is that each generation the ownership of a farm is divided into several parts. The same result occurs in parts of Germany by custom.

The percentage of landowning farmers and the percentage of tenant farmers in various European countries as well as the percentages of farm land operated respectively by owners and tenants are shown in Table 16. It will be noted that the per-

centage of farmers who operate their farms is generally larger than the percentage of the farm land operated by owners, because the landowning farmers are principally small holders.

TABLE 16. PERCENTAGE OF TOTAL NUMBER OF FARMS OPERATED BY TENANTS AND PERCENTAGE OF TOTAL LAND IN FARMS OPERATED BY TENANTS, FOR VARIOUS FOREIGN COUNTRIES

Country	Year of Census	Per Cent Rented Farms Are of Total	Per Cent Rented Area Is of Total	Country	Year of Census	Per Cent Rented Farms Are of Total	Per Cent Rented Area Is of Total
England .	1914	88.4	88 9	France . .	1892	29 3	47.2
Wales .	1914	90.3	90 2	Germany .	1907	25.4	12.7
Scotland . .	1914	92.3	88.9	Italy . . .	1914	22 4	—
Ireland . .	1916	36 0	—	Austria . .	1902	13.4	—
Sweden . .	1911	14.2	—	Hungary .	1895	2.7	9.3
Denmark .	1918	8.0	7.3	Croatia-Slavonia .	1895	1.8	2.9
Netherlands	1910	49 1	—	Roumania .	1913	11.5	38.0
Belgium . .	1910	—	54.2	Japan . .	1917	9.7	46.1

7. *Development of land tenure in the United States.* — When the United States was first settled, England had already made considerable progress in the development of modern forms of land tenure. Something resembling the manorial system was established in New York, Maryland, and the Carolinas, but villeinage had already largely disappeared in England, and in America where land was so abundant, it was difficult to maintain a supply even of free tenants. However, the common-field system with its scattered strips was never characteristic of the land system in America. Consequently, we have avoided in this country the problem of consolidating these scattered strips (inclosure) which Europe found so difficult.

In the colonies there prevailed the system of socage tenure whereby much of the land was subject to a quit rent — that is, a fixed and unchanging rent payment either to the royal gov-

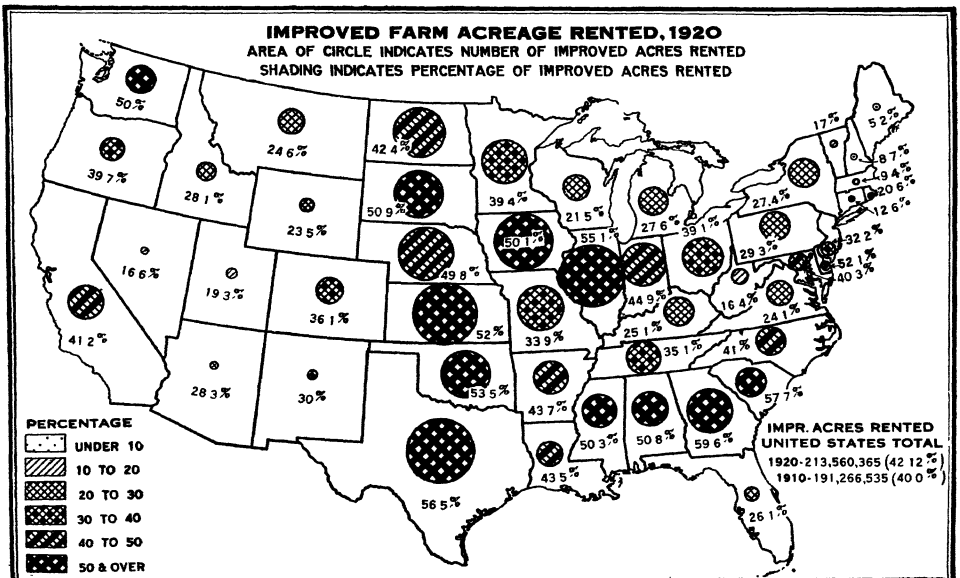
ernment or to colonial proprietors. In the Southern colonies the practice of entailing land was common, and the English custom of primogeniture gained some foothold. However, during and shortly after the Revolutionary War, most of these conditions were abolished, and American land tenure became characteristically alodial — that is, in full ownership.

II. Landownership and tenancy in the United States. — Even in the colonial period some tenants were to be found in the older settled portions of the country. However, during the entire period before the Civil War the abundance of free good land made it difficult for tenancy to develop extensively until the supply of such land was exhausted.

In each decade since 1880, the date of the first census statistics of tenancy, there has occurred an increase in the percentage of tenant farms to all farms, from 25.56 per cent in 1880 to 28.4 in 1890, 35.3 in 1900, 37.0 in 1910, and 38.1 in 1920.[1] In short, the increase in the percentage of tenant farmers for the country as a whole was very rapid up to 1900 but not very notable since that time. If we leave out of account the large increase of tenancy in the South during the decade from 1900 to 1910, the total increase for the remainder of the United States was only about 25,000 tenants. From 1910 to 1920 the rapid rate of increase in tenancy in the South which occurred from about the close of the Civil War to 1910, appears for the first time to be greatly diminished. Such increase as has occurred seems to have been mainly in several of the principal Corn-Belt states, in the tier of states from North Dakota to Kansas inclusive, and in the region to the westward.

However, statistics of tenancy alone do not indicate fully the proportion of farm land in the United States which is rented. In the first place, there is a large class of landowning farmers who rent additional land. In 1920 this class comprised 8.7 per cent of all the farmers of the United States, and the land rented

[1] Preliminary announcement of Fourteenth Census.



Photographic Files, Bureau of Agricultural Economics, U. S Dept. of Agr.

FIG. 50

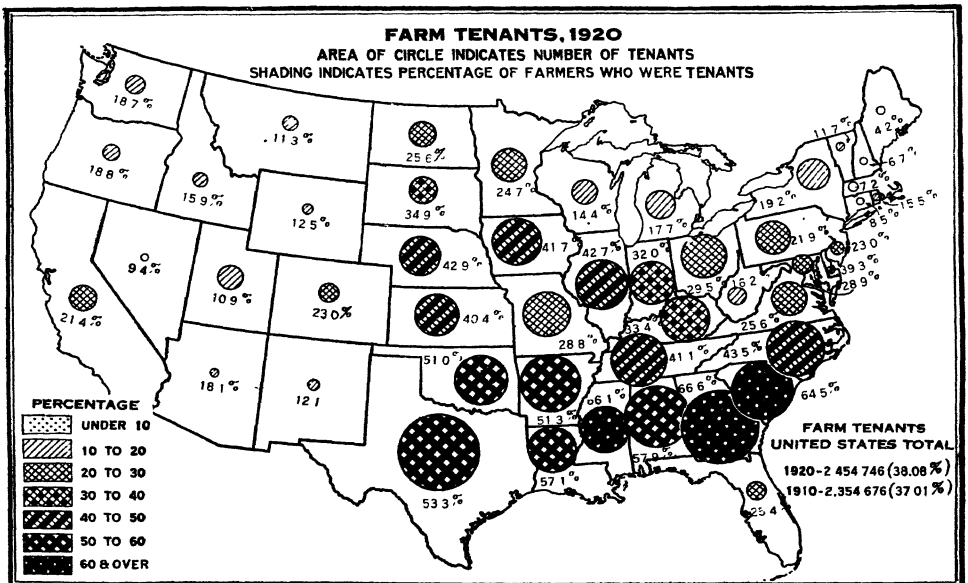
Note that the percentage of the area rented is sometimes high in states where the area rented is relatively not high, and vice versa.

by them was 9.3 per cent of the total area of land in farms. In the second place, the average size of farms operated by tenants is not the same as that operated by owners, especially in the South. While tenants in 1920 were 38.1 per cent of all farmers, rented land was 37 per cent of all farm land, but the improved farm land under lease was 42 per cent of all improved land in farms.

III. Tendencies with respect to the development of tenant farming in different states.

1. *The New England States.* — New England is a region where the percentage of tenant farming is extremely small and has tended to decline during the past forty years. At a time when agriculture was largely self-sufficing and when farm machinery was but little employed, a great deal of rugged and rocky land was improved and used for crops. Later, when agriculture became commercial rather than self-sufficing and when new fertile areas in the Middle West operated by machinery began to pour a flood of products into the markets of the world, the farmers on the poorer grades of land in New England, as well as in parts of the Middle Atlantic States, found their labor very unprofitable. Large areas were abandoned or reverted to pasture. There was little inducement for men to invest in land for the purpose of renting it to others, especially as considerable areas of land at times were decreasing in value. On the other hand, on account of the low value of land and the low rates of interest on borrowed money in this section it was not very difficult for the tenant to purchase a farm.

2. *The Southern States.* — At the close of the war it was found that the labor supply of the Southern plantation region was much less reliable and less easily controlled than under a system of slavery. In order to keep the laborer from leaving just when he was most needed and to reduce somewhat the expense and trouble of watching his every movement, it proved to be desirable to give him some kind of share in the



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FIG. 51

From the standpoint of number of rented farms the center of gravity is in the South, but not from the standpoint of improved acreage rented.

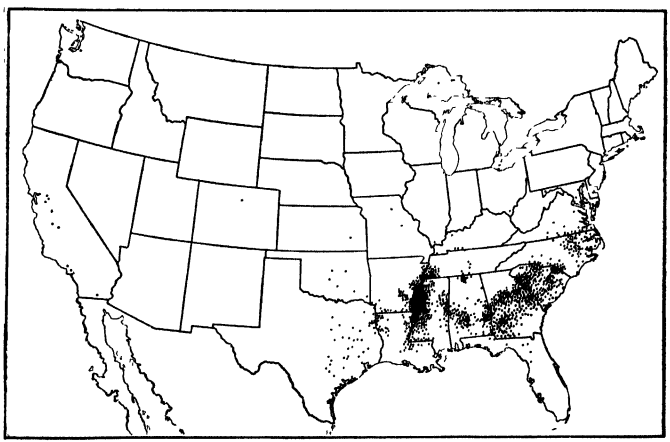
crop in return for his labor. Although in the law of many Southern states this arrangement is held to be a method of working for wages and not a form of tenancy, it has been the practice of the United States Bureau of the Census to count such laborers as tenants and their farms as tenant farms even though the plantation is operated by the planter as a single business unit with close supervision of the work of each of the so-called "croppers." Consequently, as hired laborers were changed into croppers, the number of tenant farms enumerated in the Census increased very rapidly. Moreover, many plantations were divided into farms, most of which were rented to croppers or tenants.

It should be noted, however, that the above-mentioned tendencies prevailed mainly in the plantation regions of the South rather than in the border states. In the last few decades the percentage of tenancy has been declining in Virginia, while in Kentucky and Tennessee it has been practically stationary. The plantation system prevailed in only a small part of Texas and practically not at all in what is now Oklahoma; consequently, the rapid increase of tenancy in these states is not to be attributed to the gradual break-up of the plantation system, as in the older parts of the Cotton Belt.

3. *Development of tenancy in new regions.* — In nearly all newly-settled regions of good land in the United States there has been a period when practically all farmers were landowners, because the national policy of disposing of public land made it exceedingly easy to acquire a farm. However, after a region is fully settled there are causes, hereafter discussed (page 270), which result in a certain proportion of farmers becoming tenants. It is natural, then, that after the early period of settlement there will be a period when tenancy will develop rapidly. During the past decade these tendencies have been at work in the tier of states beginning with North Dakota and running southward as far as the northern Oklahoma line. In the

preceding decade the percentage of tenancy in Oklahoma and Texas increased rapidly.

4. *The Corn Belt.* — In this region, the percentage of tenancy has continued to increase, although these states long ago passed through what may be called the post-homestead period — that is, the period when a certain amount of tenancy develops following the stage when practically every farmer has



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FIG. 52. — NUMBER AND DISTRIBUTION OF FARMS OPERATED BY COLORED TENANTS, 1920. (Each dot represents 500 farms)

Most of the farms worked by colored tenants and croppers are found on the richest soils of the South in counties formerly inhabited mainly by slaves.

a homestead of his own. In partial explanation of the continued increase of tenancy in these states it may be pointed out that they have experienced a rapid and almost continuous increase in the price of land for a half century. Why this condition is favorable to the increase of tenancy is considered on page 278.

5. *The Great Lakes States.* — The three states of Michigan,

Wisconsin, and Minnesota comprise a group in which the percentage of tenancy is not very high. This is partly due to the settlement of new areas in the northern portion of these states, resulting in a large increase in landowning farmers on these cheaper lands, many of whom were formerly tenants in the southern portions of these states. In part, however, it is due to the prevalence of dairy farming in the southern parts of these states; for, as will be more fully explained later, dairy farming is not favorable to extensive renting of land.

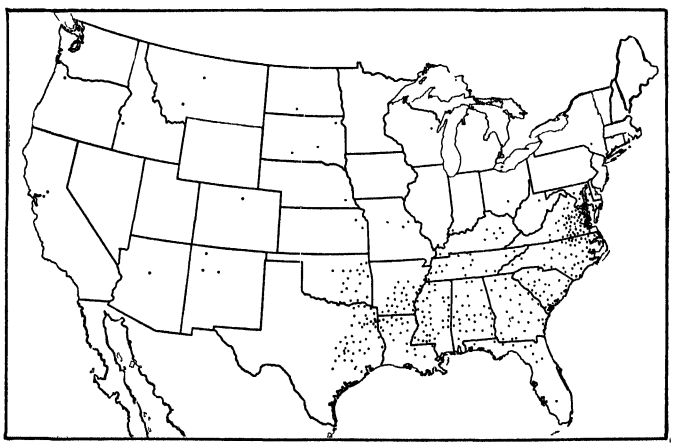
6. *The Mountain and Pacific States.* — In this group of states the percentage of tenancy is still low, and, although there has been some increase in some of these states, the immigration of landowning farmers to new areas has offset somewhat the development of tenant farming in other areas.

IV. Causes of the development of tenant farming. — There is an old saying, "It takes two to make a bargain." This principle may be applied to the interpretation of the practice of renting land. In order that the practice shall prevail, there must be owners of land who desire to rent it, and there must be farmers who are willing to farm rented land. We can analyze the causes of tenancy best by considering the conditions determining the supply of land for rent and then the conditions which determine the number of persons who desire to rent farm land.

1. *Conditions determining the amount of land offered for rent:*

a. Effect of inheritance and bequest. — Let us assume a community in which all the farms are operated by the owners, each farmer owning but a single farm. It is clear that even if no other condition occur to alter the original situation, the ownership of all the farms in the community will change with the deaths of the original owners. Now, there is every probability that some of the heirs will not be farmers, or if they are farmers, that they will not care to farm in this community.

Whether inheritance will tend to produce much renting of land or little will depend on a number of conditions. In the first place, the larger the proportion of farmers in the nation, the more probable it is that the heirs will be farmers, and *vice versa*. Again, the more the families tend to remain in the same community instead of scattering to distant communities, the



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FIG. 53. — NUMBER AND DISTRIBUTION OF FARMS OPERATED BY COLORED OWNERS, 1920. (Each dot represents 500 farms)

The greatest density of farms operated by negro owners is found in eastern Virginia, southeastern South Carolina, and northeastern Texas, all areas of cheap land. In Virginia there are almost twice as many farms operated by negro owners as by negro tenants, and in Florida the numbers are about equal, but in the Cotton Belt tenants greatly exceed owners in number.

more probable that the heirs will not only be farmers, but farmers dwelling in the same community in which the farms inherited are located. For these reasons, in earlier decades inheritance was less likely to result in the renting of farms than at present. Moreover, after a large proportion of the land in a community is rented, inheritance has much to do with perpetu-

ating this condition, for, if the owners of the land rent it instead of farming it, there is a probability that their heirs will not be farmers. The character of the laws and customs governing the inheritance or bequest of property also may have a good deal to do with determining the extent to which farm land will be rented. For instance, when such laws and customs, as in England, prevent large estates from being broken up, they tend to increase the renting of land.

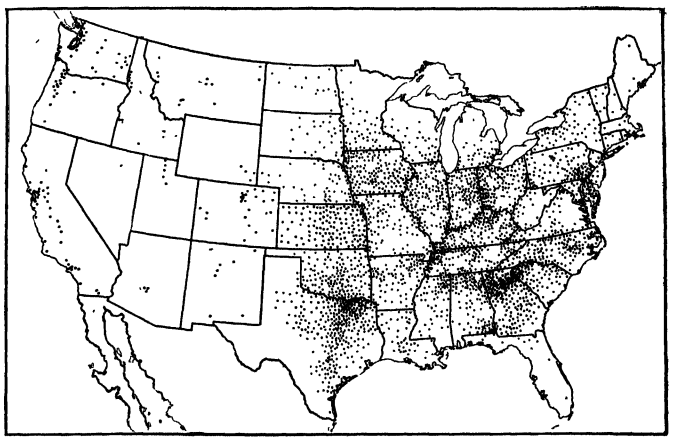
b. Retirement from farming. — Somewhat similar in effect to the transfer of farm land at the death of the owners is the tendency of farmers to retire from farming. This hastens the necessity for some one else to take over the operation of the farm, and, if the farmer owned his farm, increases the probability that the new operator will be a tenant.

c. Sentimental considerations which cause retired farmers, as well as heirs, to retain the ownership of the farm instead of selling it. — It is, of course, possible that the heir who does not care to farm or the retired farmer may sell the farm instead of keeping it to rent. In England and parts of the Continent the ownership of land, especially in large estates, is a mark of social standing. It is the traditional practice to keep an estate in the same family for generations without division. In the United States such ideas have had comparatively little influence.

Somewhat similar in effect is the sentimental attachment which a man has for the farm which his father owned or on which he has himself lived for a long time. Sometimes, also, there is a sort of pride in the ownership of a good farm. For these reasons no doubt, those inheriting farms, as well as retired farmers, prefer to retain farms rather than to sell them.

d. Temporary renting of land to sons or other heirs. — Frequently, retiring farmers let their farms to sons or sons-in-law, who on the death of the owner will inherit all or part of the farm, and, because of his relation to the owner, the tenant is allowed to rent the farm on especially favorable terms. From a num-

ber of studies in southern Wisconsin, it seems probable that at least forty per cent of the tenants in that region are related to their landlords. When tenancy is due to this cause, it may be regarded as generally wholesome. The tenant is renting while gaining experience in farm management. Regarding the farm as ultimately his own property, he is likely to keep up the



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FIG. 54. — NUMBER AND DISTRIBUTION OF FARMS OPERATED BY WHITE TENANTS, 1920. (Each dot represents 500 farms)

The largest number of farms operated by white tenants is in the upper Piedmont of the Carolinas, Georgia, and Alabama, in the black-waxy prairie of Texas, in tobacco-growing districts, and throughout the Corn Belt.

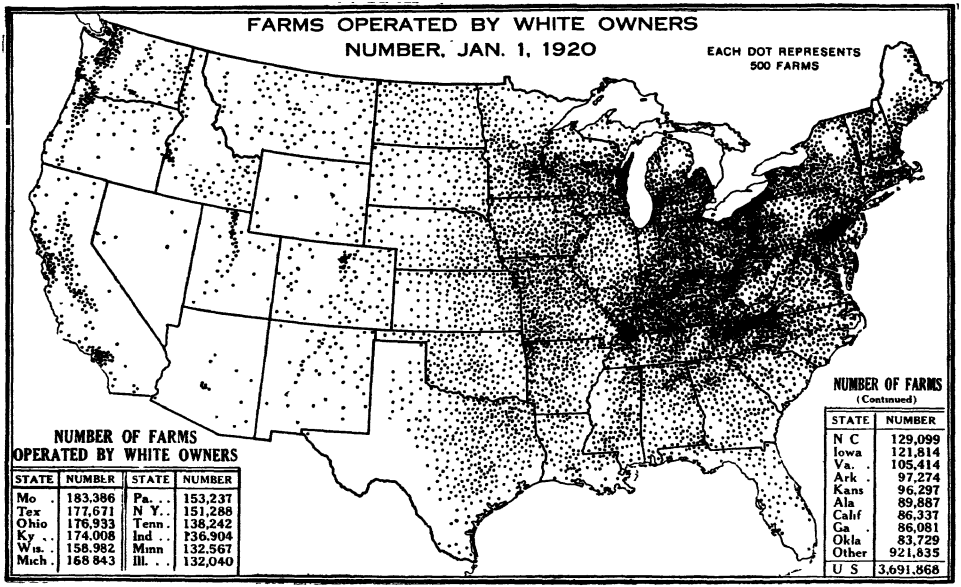
improvements, maintain the fertility of the soil, and unlike many tenants will be inclined to consider himself a permanent resident of the community.

e. Financial considerations which cause people to purchase or to retain land which they do not expect to operate. — Some people, of course, buy farm land merely as an investment. In some of the most important general-farming regions in the

United States the increase in the price of land has been so steady for many years that it has come to be a basis not only for buying land for speculation but also for investment. This practice is an important cause of increasing tenancy because it is an inducement for the buying of farm land by people who do not intend to farm it. It will be noted later that the same cause may tend to prevent actual farmers from buying the land.

f. Effect of concentration of ownership in large holdings. — It has already been suggested that large holdings are favorable to a large percentage of rented land for the reason that the owner of a single large holding is not likely to work more than a small part of it. Indeed, he is not likely to need to engage in active farming in order to make a living.

It is important, then, to understand the conditions that have brought about large holdings. In the South, many large holdings were built up in the days when slavery made large plantations profitable. Some of the largest holdings in the United States were acquired by lumber companies who have found it difficult to dispose of the land after cutting the timber. In general, however, large holdings of this character have not resulted in extensive tenancy, because land in such regions usually sells at a low price per acre, and the owners are generally quite willing to sell the land to the comparatively few buyers who desire to purchase it. Large holdings also exist in parts of the United States where large-scale farming was formerly profitable, especially in regions in the West where large ranches have been found adapted to farming. Similarly, large holdings built up in the days when large wheat farms were profitable have continued to exist in sections of the Dakotas, Minnesota, Nebraska, Kansas, and Oklahoma for some time after diversified small-scale farming has developed. A number of railroads were given large land grants by the United States Government.



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FIG. 55. — NUMBER AND DISTRIBUTION OF FARMS OPERATED BY WHITE OWNERS, 1920

The densest areas are found in districts where farms are comparatively small, except in sections of the South where tenants predominate.

In addition to these causes, the principal instances of large holdings in the better farming regions of the United States have resulted from the purchase of land when it was cheap by far-sighted speculators who realized that good farm land was certain to increase in price.

No statistics concerning the ownership of rented land have been published by the United States Census Bureau since 1900. At that time, however, there did not appear to be much concentration in the ownership of such land, except in the South. Half the farms of the United States were owned by persons each of whom had but a single farm; 14.8 per cent by persons each of whom owned two farms; and only 11.9 per cent by persons each of whom owned ten farms or over.

g. Systems of farming. — Whether or not a large number of farms will be for rent will depend to a considerable extent on the prevailing system of farming. In the first place, renting is not likely to be extensive when the system of farming is largely self-sufficing, for there will be no money return from which to pay a money rent. It is true, rent was paid in labor and products in the self-sufficing agriculture of the manorial system, but this was hardly renting in the modern sense.

However, not even all forms of commercial agriculture are favorable to the prevalence of tenancy. For instance, tenancy is not so extensive in dairy regions as in regions characterized by certain other systems of farming. A man who goes to the trouble and expense of building up a dairy herd wants to have a more permanent form of tenure so he will feel safe in making the necessary improvements that are needed for a successful dairy farm. Moreover, the receipts from dairy farming depend more on the man than on the land, so that it is less easy to standardize rents and the renting contract. Perhaps the comparatively small amount of tenancy in dairy regions is also attributable to the fact that to be successful requires habits of industry, stability, and regularity which are likely

to be associated with the thrift that will lead to ownership.

It is a recognized fact that tenant farming tends to flourish in regions where there is a single dominant money crop, as in the Cotton Belt, parts of the Corn Belt, and certain tobacco regions. The connection is due to historical conditions, to the kind of farmers in these regions, to the fact that it is easy to standardize renting agreements under the one-crop system, and to the fact that a one-crop system requires relatively a small amount of capital and skill, and therefore landlords can let their land without giving much supervision to tenants.

h. Temporary inability of farm owners to operate their land. — A good deal of land becomes available for renting because the farmers are temporarily unable to operate it. It may be that illness or business interests compel the owner to leave his farm for a year or more, or the sons grow up and leave the farm.

i. Reasons which lead farm owners to let their land rather than to operate it by hired laborers. — There are a number of obvious reasons why landowners may frequently prefer to let their land rather than to operate it themselves by means of hired labor. Hired laborers may leave just at the time most needed. Sometimes it is difficult to get along with them. Frequently, it may be easier to get tenants than to obtain hired laborers. Moreover, having no interest in the crop, many laborers have to be constantly supervised to prevent them from wasting time.

2. *Conditions which cause farmers to rent the land they farm rather than to buy it.* — We have thus far discussed the conditions which cause land to be for rent; let us now consider the conditions which cause farmers to rent land rather than to buy it.

a. Insufficient capital. — Many farmers have not sufficient capital to purchase a farm and at the same time to operate it effectively. The farmer may be a young man who has not had time to save the necessary amount. He may be inefficient and

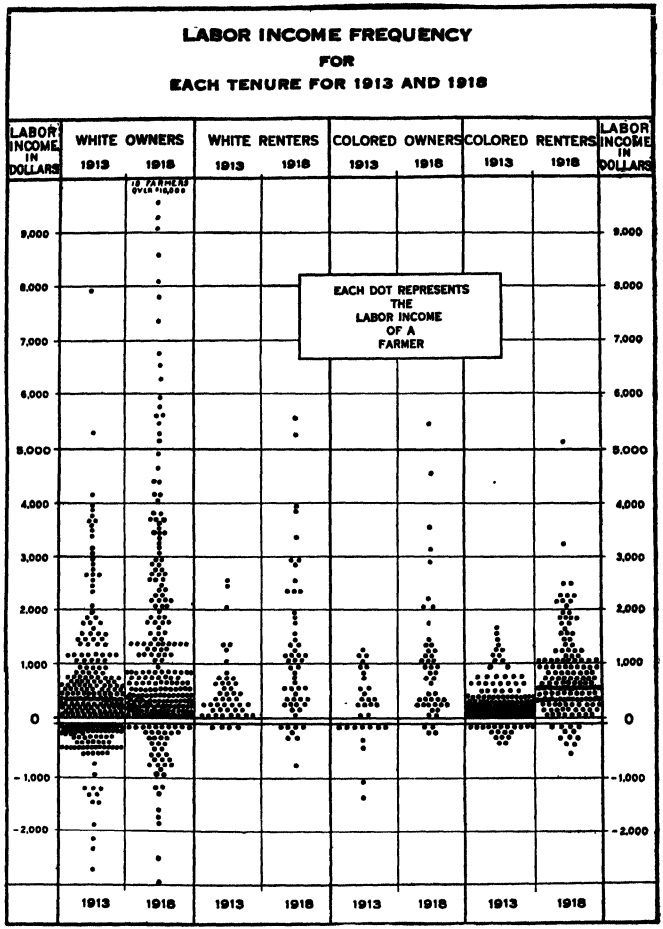
thriftless and therefore will not accumulate enough capital to make the first payment on a farm. Even if such farmers acquire the ownership of a farm gratuitously, — as by inheritance, gift, marriage, or homesteading — ignorance, inefficiency, and thriftlessness are likely to cause the ownership of their farms to slip away from them. There can be little doubt that this is one of the most important causes of tenancy.

It will be clear, however, that the problem of accumulating sufficient capital to buy a farm will depend to some extent on the cost of a farm. This, in turn, will depend on the minimum size of farm required for economical operation and upon the price of land per acre. Sometimes, as in truck farming, the price of land per acre is high, but so small an acreage is necessary that the total capital needed to purchase a farm may be small. For farms of a given size more capital will be required to buy a farm when the value of land is high than when it is low. We cannot expect a man to accumulate an initial payment of $20,000 as early in life as he would accumulate $4,000. In fact, statistics for 1910 showed that the average age at which ownership is attained had increased, mainly, no doubt, because of the increase in land value.

b. Terms of credit. — Much will depend on the terms of credit under which farms may be purchased. Clearly, the smaller the percentage of initial payment required, the easier it will be to purchase a farm, other things equal. The ability to pay the remaining indebtedness will depend in part on the rate of interest and the period of repayment.[1]

c. Profitableness of investment in land. — It has already been pointed out that in some of the best farming sections, as, for instance, in Iowa, the percentage of return for investment in farm land frequently is no more than two or three per cent. Tenants cannot afford to borrow money at five or six per cent to purchase land which earns only two or three per cent. Even

[1] For discussion of this phase of the problem, see page 347.



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FIG. 56

This chart, based on a study made in Sumter County, Georgia, shows that comparatively few of the farms returned very high labor incomes and that the majority of them returned less than $1,000.

though there may be reason to expect an additional gain through increase in land value, many tenants cannot afford the luxury of such speculation, especially if they can average a fair return for the investment of their money in operating equipment.

Of course, a landowner who operates his own farm may by good management make his investment in land pay a higher rate of return than that represented by a cash rent. However, in so far as this higher rate of return is due to good management, it should be regarded largely as a return for superior management rather than a return for investment in land. The same farmer could probably rent the land from others and still obtain most of that part of the superior return due to good management.

Moreover, we should not compare tenancy with full ownership but rather tenancy with mortgaged ownership. Let us suppose a good farm costs $50,000 and the necessary operating equipment costs $5,000. Suppose a man has $30,000 and is considering the desirability of renting a farm as compared with buying one. Allowing $5,000 for operating equipment he would be able to pay one half the value of the farm, giving probably a first mortgage for the other half. Now, as an owner he enjoys certain advantages. He is free to make improvements and is sure of enjoying the benefit from them, provided his mortgage is not foreclosed. On the other hand, he has the interest and principal of the debt to meet, and the annual interest and annual rent may correspond fairly closely or they may not. Thus if cash rent is only two per cent of the value of the farm, then our farm owner is paying annually as interest five or six per cent of the value of one half the farm, whereas he could have rented this half of the farm for two per cent. If his earnings above expenses including his own labor correspond fairly closely to the cash rent, he is in the position of paying out five per cent on the value of an investment that brings in only two per cent.

But even if we assume that the return from the land is no lower than the interest, the owner is subject to the comparative disadvantage due to the fact that the interest and principal of a mortgage are debts which must be met promptly, or the farm will be sold "under the hammer" with the result that the owner is likely to lose a considerable part of his equity. On the other hand, landlords are frequently lenient in the collection of rents, making allowances for crop failures, declines in prices, and other misfortunes. If the owner must go in debt for even more than fifty per cent of the value of the farm, the risks which he assumes are greater for him as well as for his creditors. Moreover, the owner of a mortgaged farm is tied down to his farm and the debt on it. If for any reason he desires to change his location or occupation, he must either sell the farm or find a tenant, whereas if he rented a farm for a year's lease he could leave at the end of a year without embarrassment.

These considerations are mentioned not to prove that it is always undesirable to own the farm one cultivates but rather to point out that many things need to be considered in deciding whether it is best to own or to rent.

d. Sentimental considerations leading to landownership, especially when combined with low standards of living and high standards of industry and thrift. — It is characteristic of European peasants that they have a passion for the ownership of land, a passion which is based not so much on the desire to invest their savings profitably but mainly on the feeling of security and independence, freedom from unemployment, pride of ownership, and frequently the desire to keep the old homestead in the family. This passion for land commonly leads peasants to work harder, to employ the members of their families more constantly, and to maintain lower standards of living and higher standards of thrift than American farmers will submit to. Consequently, the peasant is frequently willing and able to buy land at prices which American farmers could not

afford to pay. Now this tendency may affect the extent of tenancy in opposite ways. Of course, the passion of the peasant farmer for landownership makes him a landowning farmer rather than a tenant, and it is rather significant that in this country the percentage of landowners is larger for foreign-born farmers than for farmers born in the United States. On the other hand, the peasant farmer may frequently create in the community an artificial level of land prices so high that American farmers can better afford to rent than to buy land.

Of similar effect are the sentimental considerations which cause men to buy or retain large estates in order to acquire social position. Such motives for landownership are likely to cause the price of land to be so high that it will not yield a satisfactory rate of return on the investment.

e. Other considerations leading men to prefer to rent rather than to own the land they farm. — Young farmers frequently desire to serve an apprenticeship as tenants while learning the business of farming. Experienced farmers who move to a new country frequently find it the part of wisdom to rent a farm for a year or two. Renting also has advantages for those who for one reason or another are unsettled in their plans. Also, a good deal of land is rented by farmers who own a farm but find it profitable to increase the size of it by obtaining additional land which probably could not be purchased on satisfactory terms in the quality or location desired.

V. Significance and consequences of tenant farming. — Some of the conditions mentioned above, which result in tenant farming, may be regarded as normal, and the tenancy resulting therefrom desirable. For instance, it is probably desirable that young men be tenants for a time in order to acquire experience in management before assuming the responsibilities of ownership. Again, it is probably in the interest of general efficiency that land shall be temporarily rented when circumstances make it impossible for the owner to continue to farm it,

and particularly when it would be inadvisable or impossible to sell it to advantage. When tenancy is largely due to the fact that the tenant farmers are themselves an ignorant, irresponsible, and inefficient class, the majority of whom are not competent to manage a farm without supervision, tenancy is probably at least the more desirable of the two alternatives — operation by the landlord with hired labor and renting to tenants.

However, our conclusions concerning the desirability or undesirability of tenancy under given conditions depend very much on the form of tenancy. For instance, if the landlord is merely letting the land without providing any supervision, the system, as a whole, may probably be less productive than the alternative of farming by means of hired labor under close supervision. Again, while tenancy may be practically necessary because of the ignorance and inefficiency of the laborers, this very ignorance may cause the tenant to be subjected to oppression and exploitation on the part of the landlord — practices which serve to condemn not the renting of land but rather a bad system of renting. On the other hand, landlords have frequently followed a generous and helpful policy toward their tenants. Many English landlords with large estates spend a considerable part of their incomes in improving housing conditions and providing sanitation, education, and recreation for the tenants.

It is generally believed that the renting of land tends to the impoverishment of the soil and poor methods of farming. This is not necessarily the case. There are methods of renting land, as, for instance, in England, which result in the building up of the soil and the making of improvements. Undoubtedly, much of the poor farming attributable to tenancy has really been due to other causes. For instance, poor farming may be due to the ignorance and inefficiency of the farmers themselves rather than to the fact that they are renters. Again,

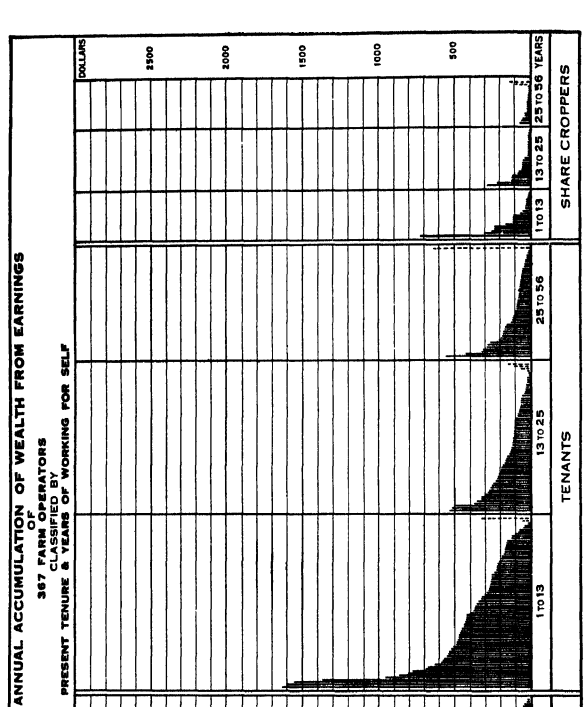


FIG. 57

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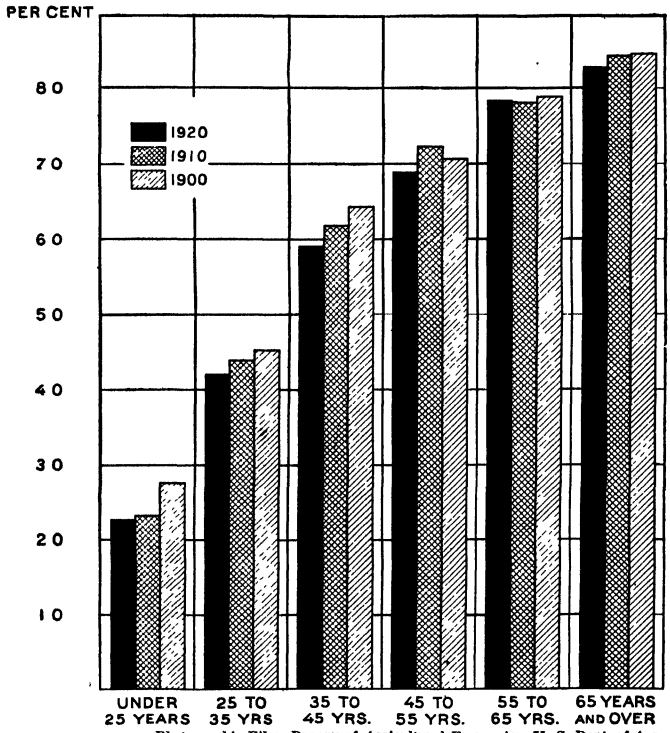
The more efficient tenants soon pass into the class of owners. Those who have been tenants longest show the smallest accumulations. Clearly, tenancy is a selective stage, weeding out those incapable of acquiring ownership.

wasting of soil resources may be due to the general system of farming carried on by owners and by tenants in the community.

Another charge brought against tenant farming is that tenants are less stable than owner farmers and that consequently tenants have less interest in permanent agriculture than farmers who own their farms. Indeed, statistics show that in the United States tenants change farms much oftener than do owner farmers. However, experience in England has shown that it is possible to obtain good farming on the part of tenants even when the lease contracts are short.

It is said that, since tenants do not remain long enough in the community, they do not acquire a permanent interest in community life. In America this is true to a considerable extent. It may be questioned, however, whether tenancy is largely responsible for the lack of stability complained of. In portions of Europe and in many parts of England, tenants remain from one generation to the next on the same farms and certainly in the same community. It may be asked, therefore, whether we should not attribute the instability of American tenants to special conditions in our own country which have made us a migratory people. Now that the period of pioneering is about completed, it may be expected that the shifting of rural population will become a less important tendency. It must be recognized, however, that a larger percentage of farm ownership in a community would probably reduce this tendency toward migration.

Some of those who condemn tenancy base their position on radical opposition to private property or at least private property in land. The discussion of this point of view must be reserved for the chapter dealing with various proposed land policies. Assuming the continuance of private property in farm land there would appear to be no reason to regard as abnormal the renting of land by men who have not accumulated enough to buy land. If $5,000 is required to make the first

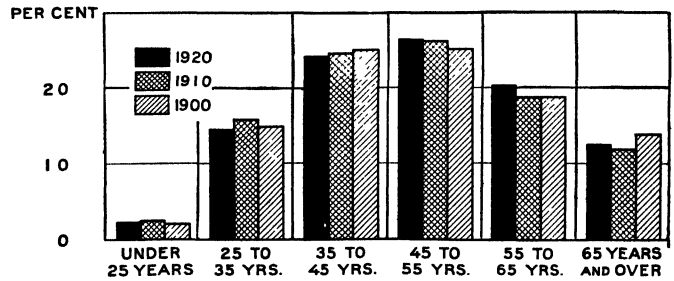


Photographic Files, Bureau of Agricultural Economics, U. S. Dept. of Agr.

FIG. 58. — PERCENTAGE OF FARM OPERATORS IN EACH AGE GROUP WHO OWNED THEIR FARMS, 1920, 1910, 1900

Since the percentage of owner farmers of all ages was higher in 1900 than in 1920, the 1900 column for each age group tends to be higher than the corresponding column for 1920. Although, the difference is much greater in the earlier than in the later age groups, this does not prove conclusively that farmers acquired ownership at an earlier average age in 1900 than in 1920.

payment on a farm, it is not to be expected that every young farmer will have this amount when he begins his career, and provided there is a fair chance that he will later be able to climb the ladder to ownership, we need not be disturbed by the fact that he must work and save for a few years to attain the goal. Nor is there reason for alarm because the age at which ownership is attained has increased by reason of increases in the size of farms and in the value of land, for, if the first payment on a farm requires a value of $20,000 as compared with a former



Photographic Files, Bureau of Agricultural Economics, U. S. Dept. of Agr.

FIG. 59. — PERCENTAGE OF OWNER OPERATORS IN EACH AGE GROUP, 1920, 1910, 1900

While the preceding graph (Fig. 58) showed that the percentage of owner operators of all farm operators increases with age, being highest in the later age groups, the number of owners is greater in the middle age groups than in the youngest or the oldest age groups.

value of $10,000, we could hardly expect a man to accumulate $20,000 as early in life as he can accumulate $10,000. In most parts of Europe it is frequently the case that two generations are required for peasants of average efficiency and thrift to accumulate the full price of farms much smaller both in acreage and in value than those which have been found economical in the United States.

For the man who prefers the ownership to the renting of a farm, there are still many cheap farms to be acquired, but these

are largely in regions of inferior opportunity. If a tenant has a good farm, a good landlord, and a satisfactory renting contract, he may well think twice before changing his position in order to become the owner of a cheap farm. Some local surveys have shown that tenants in good farming regions have a larger annual income and accumulate wealth more rapidly than farm owners do in some of the regions where it is comparatively easy to become a farm owner. Of course, there will always be opportunities in newly-developing regions, and some tenant farmers may better their economic condition by moving to such regions.

In short, from an economic standpoint we need not deplore tenancy as such, but rather, bad forms of tenancy.

VI. Principal methods of renting farm land in the United States. — From the standpoint of the method of rent payment there are a number of different systems of renting, each of which may be desirable under certain circumstances and undesirable under others.

1. *Competitive cash rent.* — In competitive cash renting the landlord usually furnishes only the real estate, paying taxes and the money cost of upkeep. In the United States the amount of rent to be paid generally is determined at frequent intervals as a result of the supply of land and the demand for it. Under this system the landlord does not assume the risks of farm operation nor any responsibility for management. Consequently, such a plan is likely to appeal to a landlord who is not in a position to give much attention to his farm, while it is likely to be preferred by tenants who desire to be independent of the landlord and who have sufficient capital with which to operate the farm or can make the farm pay more than it would earn under average conditions of management in the community.

In Ireland, a country that was formerly overpopulated, cash renting took the form of "rack-renting." Tenants were very

poor, and the only opportunity of employment was to rent a small piece of land. This put landlords in a position to exact a rent which in average years left the tenant barely enough to exist on and in poor crop years resulted in widespread famine. These conditions have largely been altered in Ireland through changes in land policy. In general, land has been so plentiful in the United States that such conditions have not developed here, but there is danger that where the farm population is largely made up of persons of little capital similar conditions may develop as land becomes scarce.

2. *Standing rent.* — This is a modified form of cash rent. Instead of agreeing to pay a certain amount of money for the use of land, the tenant agrees to pay a certain quantity (not a share) of the product — as, for instance, so many pounds of cotton or so many bushels of grain. In this system the landlord does not assume the risk of loss through bad seasons or poor management and, therefore, does not have to take any responsibility in the management of the farm. However, he shares with the tenant the risk of changes in the price of the products paid as rent.

3. *Customary, or fixed, rents.* — In some parts of Europe rents have been fixed by custom, either in money or in a certain quantity of products, and the amount of rent does not change from year to year as a result of bargaining between landlord and tenant. Consequently, if the economic rent of the land increases, the tenant receives the full benefit of the increase and thereby acquires a valuable equity which he may capitalize or sell, provided his contract permits him to sublet his property or to transfer his contract. Somewhat similar in effect are long leases covering a period of many years and involving a fixed and unchanging rent. Neither customary fixed rents nor long cash leases have been extensively employed in the United States.

4. *Share rents.* — In the United States about two thirds of all rented farms are rented for a share of some or all the products

of the farm. Usually, also, the landlord makes certain contributions toward the expenses of production, and, because his rent depends in part on how well the farm is managed, he is likely to contribute freely of his own time, as well as of his capital, toward making the business a success. Such an arrangement is likely to be beneficial to the tenant who lacks capital and experience in management.

The fractional share is likely to be rather rigidly fixed by custom and varies only as a result of important changes in the system of farming or in the value of land. On very rich land the fractional share is sometimes higher than on poorer land even in the same community.

As a matter of fact, however, one cannot always be sure that the rent is the same because the fractional share is the same, for there may be differences in the contributions of the two parties with respect to such items as the fertilizer bill, the twine bill, seed, threshing, etc. As a result, the system of share renting is more responsive to the influence of competition than might appear from the unchanging fractional share.

5. *Stock-share leases.* — Under the stock-share lease, the landlord furnishes half and sometimes all of the live stock; pays half of the expenses of farm operation, excepting expense for labor and machinery; and gets one half of all receipts including receipts from live stock and live-stock products. Thus it is a sort of economic partnership and has the advantage of promoting live-stock production. It is, of course, a method of renting which requires that the parties be able to get along well with each other and have confidence in one another.

It should be noted, however, that it is not necessarily fair for each party to contribute half of all expenses, except land and labor, and share equally in the receipts, for land and labor may be unequal in value. For instance, if the annual use of the land is worth $1,000, the annual labor employed is worth $3,000, and the other expenses amount to $2,000, the landlord

will have contributed $2,000 and the tenant $4,000. It would not be fair to share the receipts equally.[1]

6. *Share-cash leases.* — In the United States it is quite common to pay both a share rent and a cash rent for the same farm. Usually, the cash rent is supplementary to the share rent. Sometimes the share rent is paid for the crop land and cash for pasture land. In some sections where the customary fractional share no longer yields as much rent as conditions make possible, the cash rent is paid as a bonus or additional rent. In most essentials, share-cash leases closely resemble share leases.

QUESTIONS ON THE TEXT

1. What were the principal characteristics of the village system?
2. In what important respects did the manorial system differ from the earlier village system?
3. What was the common-field system?
4. How were manorial tenants different from modern tenants?
5. State some of the important characteristics of land tenure in modern England.
6. In what countries of Europe is the percentage of rented farms more than fifty per cent? More than seventy-five per cent?
7. In what countries of Europe is the percentage of rented farms less than fifty per cent? Less than twenty-five per cent?
8. How did the early development of land tenure in the United States differ from that of England?
9. How do the prevailing laws and practices in the United States governing the inheritance of land differ from those of England? Of France?
10. Why was the extent of tenancy not very important before the Civil War?
11. How did the percentage of farms rented in 1920 differ from the percentage of land in farms rented? From the percentage of improved land rented?
12. Is a large percentage of farm land in New England rented? Why?
13. What circumstances account, in part, for the high percentage of tenancy in the plantation regions of the South?
14. Why is tenancy not very extensive in dairy regions?

[1] For further discussion of this problem see "The Farm Lease Contract," by L. C. Gray and Howard A. Turner, *Farmers' Bulletin 1164*.

15. Why will inheritance have less influence in increasing tenancy in an early period of a nation's development than in a later period?

16. How does the retirement of farmers from the farm tend to increase tenancy?

17. What sentimental considerations tend to promote the development of tenancy?

18. What financial considerations induce men to invest in land or to retain the ownership of land even though it yield a low rate of return on the investment?

19. To what extent is the rented farm land of the United States owned in large holdings? What are the causes of concentration of land ownership.

20. Is concentration of land ownership favorable to the development of tenancy?

21. What is the relation between a one-crop system of farming and the development of tenancy?

22. Summarize and explain the conditions that lead farmers to prefer to rent rather than to buy the land they operate.

23. In what respects may we consider a certain amount of tenancy normal and desirable?

24. Summarize the principal reasons why tenancy is regarded as undesirable from the standpoint of the national welfare.

25. To what extent could the objections to tenancy due to bad forms of tenancy be removed by improvements in the system of tenancy?

26. Is there necessarily reason for alarm because farmers acquire the ownership of the high-priced farms of to-day at a later age than they acquired the ownership of cheaper lands a generation ago?

27. Is a farmer necessarily worse off as a tenant in Iowa than as an owner of the cheaper farms to be obtained in undeveloped regions of the country?

28. What are the advantages of cash renting from the standpoint of the landlord? Of the tenant?

29. How does standing rent differ from cash rent?

30. What are the advantages of share renting from the standpoint of landlords? Of tenants?

31. What is a stock-share lease?

SPECIAL PROBLEMS

1. Do the experiences of Germany, France, and Denmark indicate that high land values necessarily result in the prevalence of tenant farming?

Are there regions of high land values in the United States where the percentage of tenancy is not high?

2. What is meant by part owners (sometimes called owners additional)? What percentage of the farmers of the United States are part owners, and in what sections do they comprise a large percentage of the farmers?

3. In what countries of Europe is the percentage of farm land rented larger than the percentage of farms rented? In what states of the United States is this the case? How do you account for this?

4. Is there a large percentage of tenancy in your county? What are the important reasons?

5. Do tenant farmers employ poorer methods of farming in your county than do landowning farmers? Do the tenants exhaust the soil more rapidly? Do they take less interest in the community? Could you suggest methods of improving the present conditions without abolishing tenancy?

6. Is cash renting or share renting more prevalent in your county? Why?

7. What are the principal regions of the United States where cash renting is more prevalent than share renting?

8. Is there reason to believe that the tenant will farm more intensively if he rents for cash than if he rents on shares?

9. Draw up a lease for the farm on which you live.

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CHAPTER XVI

LAND POLICIES

I. Land nationalization
II. The single tax as a system of land reform
    1. Claim that the single tax would improve wealth distribution
    2. Claim that the single tax would force land into use
    3. Argument that the single tax would encourage the improvement of land
    4. Assumption that the single tax would result in a more efficient use of land
    5. Claim that the single tax would reduce the difficulty of financing the farm enterprise
    6. Probability that the single tax would encourage the wasteful use of land
    7. Claim that the single tax would reduce speculation in land
    8. Special land taxes not to be confused with the single tax
III. Nature of the problem of land reform
    1. Objectives to be obtained in and through our land policy
IV. Methods of improving the relationship between landlord and tenant and the system of tenant farming
    1. A suitable tenant contract
    2. Compensation for improvements
    3. Developing more efficient systems of tenant farming
    4. Protecting tenants from oppression and exploitation by landlords
V. Methods of discouraging absentee ownership of farm land
VI. Methods of restricting speculation in land
VII. Breaking up large land holdings
    1. Legislation regulating inheritance
    2. Graduated land taxes discriminating against large holdings
    3. State purchase of large holdings for redistribution

VIII. Land settlement and resettlement
  1. Special characteristics of the problem of expansion in the United States
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IX. A liberal system of mortgage credit an important part of the general land policy

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XI. Policy of disposing of the public domain

Some of those who deplore all forms of tenancy base their position on radical opinions concerning private property in land. From the standpoint of those persons the paying of rent is a form of tribute, making possible a soft-handed income for the fortunate owners of the land. Some who would not condemn private property in other kinds of goods consider private property in land especially indefensible because they argue that land is the gift of nature or God and ought to be free to all.

I. Land nationalization. — Let us first face the question squarely: Would government ownership of farm land prevent land from being made the basis of the payment of tribute by the workers to those who do not work? If it be assumed that the state will acquire the land without paying for it, the present owners would no longer receive the tribute, but the users of land would not be relieved from paying it. The users of land would then be the tenants of the state. They would necessarily pay as much rent as they would pay under private ownership, for otherwise the users would have a valuable special privilege comparable to the ownership of an equity in the land. Unless forbidden by law this equity would become the object of purchase and sale, being either rented by the holder to others or sold outright. If, then, the user of the land pays the full economic rent to the state, he is no better off than he was before

when he rented from a private landlord, unless we assume that the state is a better landlord than is the private landowner. However, it has not been the experience of the world that the state is necessarily a good landlord. Much depends on the state itself.

In America our various local governments collect an annual charge from the land as a tax. This tax, of course, is largely a part of the economic rent of the land. Now, it is a notorious fact that in taking this payment from the land all kinds of inequities exist. Local assessors favor their friends and shift the burden to a large extent, not only to the backs of other taxpayers within the county, but as far as possible to other counties. If the state were in a position to collect all of the economic rent from the land instead of only part of it, is there any reason for believing that there would be less inequity and fraud in its assessment and collection than in the case of present land taxes?

It must be recognized that some private landlords perform important functions which would have to be assumed by the state under government ownership. Frequently, they aid young and inexperienced tenants with advice and supervision. Frequently, also, they supply tenants with needed operating capital which they cannot readily obtain from other sources. Moreover, the landlord's private self-interest frequently leads him to select his tenants with care, a process that probably tends to put the better grades of land in the hands of the more efficient farmers. The landlord is vitally interested in the care and improvement of his farm. Many landlords also perform important functions in social leadership, contribute to charitable enterprises, and aid their tenants in time of misfortune. We should not lose sight of these facts even though we must also recognize that some landlords are guilty of oppression while others are absentee owners who contribute nothing toward the efficiency of agriculture or the upbuilding of the community.

Recognizing, then, that the users of farm land might not necessarily be better off as tenants of the state, who would be benefited? If we assume the state already owns the land or acquires it without paying for it, taxpayers in general would be relieved to that extent of the necessity of contributing to public revenue in other ways. The result is not to reduce the size of the burden of public expenditure. The effect is merely a shift in the burden of taxation. The question, then, is one of the distribution of income, and the effect of a policy of land nationalization depends largely on how the process is brought about.

Let us assume first that the state seizes the land without compensating the owners. The effect would be to deprive present land owners of the income from their lands and to relieve other taxpayers to that extent of the payment of taxes. Would this improve the distribution of income? In the United States farm land is owned by millions of people who are either poor or at best in moderate circumstances. A considerable part of the taxes of the nation is now paid by very wealthy men who own little or no farm land. It is, then, by no means clear that the distribution of wealth would be improved by the process. It is true some large landowners would be deprived of their property, but in cutting off the head of one big man we should also remove the heads of many little ones.

Furthermore, many farmers have borrowed heavily on the security of their lands. If they lost their property, their credit would be destroyed, and many of them would have to quit farming. The numerous important institutions of credit which lend on the security of land, such as banks and large insurance companies, would also be ruined, and their stockholders and bondholders, as well as the holders of insurance policies, whether rich or poor, would be deprived of their wealth. Fearing that the policy of confiscating landed property would be applied to other forms of property, people would be discouraged from saving and investment.

The only other method of nationalization is for the nation to buy the land. The nation would have to issue its bonds for the purpose of purchasing the farm land of the United States, valued at nearly $55,000,000,000 in 1919. Even assuming it to be financially practicable, such a transaction would not immediately alter materially the distribution of wealth. The landowners would receive in cash or bonds the value of their lands, and the income from the land would then be collected by the government and paid out to bondholders, many of whom would be the former owners of the land. However, the distribution of wealth might ultimately be seriously affected. Many present landowners can employ wealth wisely in the form of land who would not know what to do with the equivalent in cash and would probably waste the money or be swindled out of it.

We have already pointed out that land nationalization would not abolish tenancy but rather would make it universal. It is conceivable that the government might improve the present methods of renting land, but it is also possible to improve conditions of tenancy under private landownership. Moreover, to perform the functions now performed by landlords would require a vast army of public officials and involve possibilities of graft and political corruption which stagger the imagination.

Furthermore, no incentive has yet been found that will stimulate human exertion and thrift like the prospect of acquiring the ownership of a farm. Men have endured incredible hardships and dangers on the frontier in order to obtain a farm which at the time had little money value. We have already noted how European peasants toil and save to pay for a little farm, even though it require two generations. Men will work unceasingly to improve the farm if it belongs to them. The ambition to acquire the ownership of a farm supplies a definite goal toward which the farm family can work and save. Such a definite objective gives unity of purpose to human lives, stab-

ilizes character, and creates a real and vital interest in the community.

The reader will at once recognize that these advantages largely depend on the ownership of land by farmers themselves. However, under private property in land the tenant farmer also may be inspired by the hope of achieving the ownership of a farm.

Before leaving the subject of land nationalization, it is important to recognize the fact that the proposal as applied to farm land must be sharply distinguished from the proposal for government ownership of forest land, mineral land, and perhaps even city land.

II. The single tax as a system of land reform. — One of the most influential of the radical proposals for land reform is the so-called single tax, which resembles in some respects the proposal for land nationalization by confiscation.

As originally proposed by Henry George, the plan involved the raising of all public revenue by a tax which would appropriate to the state practically all of the economic rent of land. Since it was proposed to abolish all other forms of taxation, the significance of the term " single " will be understood. Now, some important questions have been raised as to whether such a tax would yield sufficient revenue to provide for all public expenditures and also as to the financial soundness of depending on a single source of revenue. These aspects of the question, however, do not concern us in the present connection. We are interested in the proposal from the standpoint of its desirability as a system of land reform as applied to farm land.

It has already been suggested that the single tax bears a close resemblance to land nationalization accomplished by confiscation rather than by purchase. Both would take from the present owner the value of his property in land. The single tax would leave the present owner the legal title to his land but would make such ownership practically valueless. Assuming

the tax to be correctly levied, the value of the farm would be equivalent only to the value of the improvements.

It is, of course, an important question as to what would be included in improvements, whether merely the buildings, fences, and other structures or also improvements such as clearing of timber and stones, drainage and irrigation, and soil improvement. In old countries, much of the usefulness of land is the result of many generations of activity on the part of the users or owners of the land. Undoubtedly the proposal to separate all the man-made value from the value due to national or social causes involves great difficulties.

The argument for the single tax has been based largely on broad philosophical considerations concerning justice and human rights. For the present discussion, however, we shall not go further into the broader philosophical phases of the discussion of the single tax, but shall content ourselves with considering it from the standpoint of its probable advantages or disadvantages for promoting an efficient use of farm land and a reasonably fair distribution of wealth.

1. *Claim that the single tax would improve wealth distribution.* — Single taxers have laid much stress on the inequality and injustice in the distribution of wealth which result from the private appropriation of economic rent by means of the ownership of land. They have written much about land hogs and land monopolists and have illustrated their points by selecting instances of large bodies of land owned by single individuals and corporations. However, though concentration of landownership is prevalent in England, it is little more than a figure of speech to talk of land monopoly in the United States, where there are several million owners of farms. Moreover, it is entirely possible to prevent concentration of landownership, or to do away with it if it has already developed, without going to the extreme of appropriating by taxation all the economic rent of land whether of large or small holders, as proposed by single taxers.

In fact, assuming that a certain acreage of land is to be rented, it does not necessarily follow that a single large landlord is always a worse arrangement than many small ones. There are certain large rented estates in the United States and England which are admirably managed. However, the instances of enlightened management are not so numerous but that it is desirable to develop land policies which will tend to restrain any tendency toward excessive concentration in the ownership of farm land.

In general, the merits of the single tax as a means of improving the distribution of wealth are not essentially different from those aspects of the question of distribution already discussed in the consideration of land nationalization by confiscation. Even though the policy of appropriating land value by taxation were applied gradually, as some followers of Henry George have proposed,[1] there is no reason to believe that the gradual taking away of a large proportion of the property of several million American farmers, retired farmers, widows of farmers, and other small landowners would improve the distribution of wealth.

One of the reasons urged by the single taxer in justification of his proposal is that land value is unearned. It is pointed out that the value of any piece of land was originally zero, and, if we leave out of account the value of improvements, the remaining value of the land has come about not through the labor of the owner but through social conditions over which he has no control, such as demand for farm products, the construction of railways, or improvement of the community.

Now, there are extreme cases especially in new countries where men purchase farm land for a small price per acre and after holding it a few years find it possible to sell at several hundred dollars an acre, pocketing an "unearned increment,"

[1] Mr. C. B. Fillebrown is the author of the proposal of the gradual amortization of land value by taxation. See *A. B. C. of Taxation*, etc. (New York, 1909).

as it has been called. However, it is dangerous to argue too much from extreme cases. Much of the increase in value of farm land in the United States has been received by actual farmers who have labored for the upbuilding and improvement of the community. Furthermore, a large part of the increase represents improvements made in the farm by the labor or money of several generations of farm owners.

Even if we assume that those who acquired their property a long time ago are to be credited with an unearned increment, this is not true of recent purchasers who have paid the full value of the land. Whether what they own is earned or unearned depends on how they acquired the money which they paid for their farms. Some may have inherited it, others may have stolen it or acquired it by gambling or speculation, but many others have undoubtedly earned it through hard labor and painful saving. For many it represents the results of a lifetime of hard work. Is it fair to take away the property of these persons in order to get at some who may not have earned their wealth by their own work; and, again, is it fair to take away the wealth of those who have invested in land while we exempt entirely those unearned fortunes which have been invested in other kinds of property? When we face these propositions fairly, it is difficult to avoid the conclusion that the single taxer is advocating the Herodian method of cutting off the heads of the many in order to destroy the one.

2. *Claim that the single tax would force land into use.* — One of the most plausible arguments for the single tax is that the proposed plan would force land into use. It is pointed out that vast areas of land are held out of use by speculators who are waiting for an increase in its price. The single taxer's claim that the tax would force farm land into use is based on the assumption that the higher tax on unused land would compel the owners thereof to use it since they could not afford to continue to pay the tax without using it. Now, one may ask

why the so-called speculator holds out of use land that would yield a rent. Even if he is mainly interested in holding the land for an increase in value he may as well be getting the rent in the meantime. Using the land need not reduce the tendency for it to increase in value. In some new countries good land remains unused for a time only because of scarcity of labor and capital to put it into use. It is difficult, then, to see why increasing the taxes on land would force it into use if it is true that most of the land capable of yielding a rent is probably already used so far as labor and capital are available. On the other hand, if a man owns land incapable of yielding a rent, increasing his taxes will not make it easier for him to use it, for to work it at a loss would only make matters worse.

3. *Argument that the single tax would encourage the improvement of land.* — However, another phase of the argument is to be considered. It is held that if improvements were exempted from taxation, as it is proposed to do, this would reduce the cost of improvements by the amount of the exemption. Consequently, it is argued, it would pay to make improvements on land where improvements subject to taxation do not now pay.

However, would men care to put improvements on land under the single tax? In order to invest in the improvement of land the investor would have to stand good each year for the payment of the land rent to the government. Even if he lets the farm, he will have to collect the rent and turn it over to the government. There can be little doubt that if the single tax were in operation, many persons would not care to incur the responsibilities of landownership when all the advantages have been removed.

4. *Assumption that the single tax would result in a more efficient use of land.* — It is sometimes claimed that the single tax would result in a more efficient use of land. There can be no doubt that many persons are enabled to continue farming by

inefficient methods because they own the land, probably having obtained it by inheritance or gift, who, if they were compelled to pay the full economic rent in addition to other expenses, could not make a living. On the other hand, many others are stimulated to exertion, thrift, and efficiency by the desire to acquire farm ownership. Moreover, in various ways land tends to pass from the control of the inefficient into the control of the efficient.

5. *Claim that the single tax would reduce the difficulty of financing the farm enterprise.* — One of the arguments for the single tax is that it would greatly reduce the problem of financing a farm enterprise. Land value is the largest item in the total capital required for farming. If it were possible to obtain land merely by agreeing to pay the tax, the farmer would be relieved from the necessity of providing the capital to purchase the land. However, this advantage is available under present conditions by renting from private owners. At most, it may be said that one could enjoy some of the advantages of ownership — permanence of tenure, independence, and freedom from interference — without the disadvantage of having to buy the land.

6. *Probability that the single tax would encourage the wasteful use of land.* — This leads to a question of great importance. Is it not possible to make the acquisition of landownership too easy? Would it not result in land falling into the hands of inefficient persons who are not ready for the responsibilities of ownership? More than this, even if a man is efficient, would he have any reason to conserve soil fertility? He has no stake in the land and, therefore, no interest in preventing it from being wasted or injuriously used. Abundant experience in this country has shown that when land is cheap, there is a tendency to mine the soil and then move to another farm. It is true, the ownership of the improvements might give one a motive for looking to the maintenance of soil fertility and other natural advantages, but it must be remembered that in many parts of

the country improvements are of a very temporary and inexpensive character.

7. *Claim that the single tax would reduce speculation in land.* — If the single tax in its extreme form were honestly and efficiently administered and if it were so applied as to absorb all the value of the land, there would be no basis left for speculation. If it were dishonestly and inefficiently administered and if the tax did not appropriate all of the economic rent, there might be room for much speculation intensified by political intrigue and collusion with public officials.

8. *Special land taxes not to be confused with the single tax.* — From time to time single taxers may be found advocating various forms of special land taxes which do not go to the full extremes of the single tax. However, there is no reason to confuse special land taxes with the single tax merely because such taxes are sometimes advocated by single taxers. A number of different kinds of special land taxes are entitled to very serious attention by those who are considering constructive policies of land reform. These special land taxes are discussed in a later portion of this chapter.

III. Nature of the problem of land reform. — In America we have been accustomed for several centuries to the idea of private landownership. The great body of landowning farmers are not likely to consent to any plan involving the confiscation of their property. We may as well, then, count on the continuance for a considerable period of time of our present system of private ownership of land and land value. However, certain abuses have grown up, and it is important to consider some of the evils and the methods of correcting them.

1. *Objectives to be obtained in and through our land policy.* — Let us summarize briefly some of the aims which we believe should be kept in mind. They are as follows:

a. Assuming that we shall have tenants and landlords, we should strive to develop a business and personal relationship

between landlords and tenants which will give to each a fair return for his contribution to production, promote harmonious relations between the two parties, insure a reasonable permanence of tenure, and promote good methods of agriculture.

b. The road from tenancy to landownership should be kept open and all unnecessary obstacles to the transition removed. It will be found that this involves a number of different policies.

c. In the opening up of new lands, arrangements should be developed which will result in the smallest possible per cent of individual failures, reduce the hardships of pioneering as far as practicable, and make wise provision for community development.

d. Closely related to this is the important objective of controlling the rate at which the nation's reserve lands are employed in agriculture.

e. The most efficient use of land, so far as this is dependent on land policies, should be encouraged.

f. We should aim to bring about a democratic distribution of wealth and establish a definite relation between reward and service, in so far as these ends can be accomplished by land policies.

g. The legal arrangements for the transfer of land should be made as simple, safe, and inexpensive as possible, and a high level of ethics on the part of real estate men who act as middlemen in effecting the transfer of land should be promoted.

These various aims cannot be attained by any single method or panacea but by many different kinds of land policies, nor is it probable that any policy or group of policies will fully realize these aims, for we can hardly expect perfection in economic life.

IV. Methods of improving the relationship between landlord and tenant and the system of tenant farming. — Since a large proportion of the farms of the United States are likely to be occupied by tenants, at least for many years to come, it

is extremely important that the systems of renting be such as to insure an equitable division of the product, harmonious relations between landlord and tenant, stability of tenure, and an efficient and permanent system of farming. Let us consider methods of accomplishing these ends.

1. *A suitable tenant contract.* — For the most part we have followed rough and ready methods of formulating tenant contracts in which custom has played a considerable part. However, as agriculture has become more and more commercial, business-like, and complex and as land has increased greatly in value, the problem of formulating equitable lease contracts is becoming more and more difficult; the proper formulation of the lease contract demands the service of the economic expert as well as of the lawyer.

2. *Compensation for improvements.* — In America renting contracts are made for short periods. The great majority are for one year, and few extend for a longer period than five years. In general, short contracts are considered desirable by students of this problem. In England, where long leases were at one time commonly employed, they have been largely abandoned in favor of short leases. The advantage of the short lease is that it is more flexible, being adaptable to changes in prices of farm products, land, labor, and other factors of production, as well as to changes in systems of farming. Moreover, it leaves both parties free to abandon the arrangement if it is not satisfactory, while, on the other hand, it can be renewed from time to time if both parties are satisfied.

However, short leases have one great disadvantage. Since the period of tenure is short, the tenant is largely deterred from improving the farm, for if he improves it the landlord and succeeding tenant may get all the benefit. To a certain extent, this difficulty is avoided if the landlord himself makes the improvements. However, many improvements can be made more cheaply by the tenant employing his own labor and that of his

teams in odd times. Some improvements, such as soil betterment, are a sort of by-product of the system of farming.

In order to encourage the tenant to make improvements while still retaining the advantages of short leases, two methods have been employed. In Ireland and Scotland legislation provided for permanence of tenure for the tenant, subject to the determination of a fair rent from time to time by a land court and on condition that the tenant practice good farming methods. This legislation also recognized what is called the "tenant right" — that is, the right of the tenant under certain conditions to sell any equity in the value of the farm which he might have acquired as a result of improving the farm. This arrangement proved not wholly satisfactory, for it is really a system of joint ownership and responsibility. Naturally, the landlord might not approve of the new tenant to whom the former tenant wishes to sell his tenant right. Moreover, tenants are not only compelled to supply all capital for making improvements but also must have capital enough to buy out the old tenant.

Another method of encouraging improvements by tenants is the system of compensation for unexhausted improvements, which has been established for about forty years in England and which is also found in Scotland. Under the English system the law compels the landlord to allow the outgoing tenant the fair value, as estimated by expert appraisers, of any unexhausted improvements made by him. In practice this frequently results in the incoming tenant purchasing the tenant right.

In the United States a few landlords have made experiments along this line, and bills to establish compulsory compensation have been introduced in one or two state legislatures, but thus far no law of the kind has been passed.

The writer has been asked several times why such a system has not developed in so progressive a country as ours. The question is a difficult one. Probably the principal explanation

is that landlords and tenants have not been greatly interested in the matter. Perhaps the majority of landowners intend to sell their farms just as soon as they can do so at a profit. Tenants, for the most part, have not been interested in remaining for a long time on the same farm nor in building up soil fertility. Our abundance of land has made us prone to exploit rather than to improve land. Again, the landlords most interested in the improvement of their farms are those retired farmers and other country landlords who are able to bring about necessary improvements either through specifications in the lease or by personally controlling the system of farming.

However, there can be no doubt that carefully drawn laws should be passed which would compel those landlords who do not care whether or not their farms are improved to ensure compensation for improvements made by their tenants.

It is also probable that landlords should be restrained by law from arbitrarily dispossessing their tenants except for good and sufficient causes. Such legislation has been passed in England.

3. *Developing more efficient systems of tenant farming.* — While the system of compulsory compensation would be beneficial, we should not expect too much of it. While it compels landlords to compensate tenants for improvements made, it does not compel the tenant to make the improvements. If the tenant is ignorant, shiftless, and wedded to inefficient methods of farming, we must depend on the various educational agencies which are teaching farmers how to improve their systems of farming.

4. *Protecting tenants from oppression and exploitation by landlords.* — When tenants are extremely ignorant, possessed of little property, and very dependent on their landlords, there is likely to be a tendency for the latter to take unfair advantage of the tenants' weakness, and oppression and exploitation result. Such conditions formerly prevailed in Ireland, and they are to be found to some extent in the South. Tenants fre-

quently are exploited by high rates of interest (partly justified by the large risks and extensive supervision required), by excessively high prices for supplies purchased from commissaries, and by the landlords' purchasing the tenants' cotton at prices much lower than market prices.

There is enough reason for some of these practices to make the whole problem a difficult one. Little can be gained without a proper comprehension of the historical background and a thorough comprehension of the special difficulties confronting the Southern landlords and plantation operators. However, there is hope for the solution of the problem along some of the following lines:

a. Suitable provision for the practical education of tenants and their children is probably the most important way of dealing with this difficult problem, for improvement in tenants' conditions is likely to be in proportion to their progress in intelligence, standard of living, thrift, efficiency, and self-respect.

b. The development among landlords and planters of the point of view that progress of their tenants in thrift, standard of living, and efficiency will in the long run be profitable.

c. Development of a system of governmental short-time credit specially designed for the peculiar conditions, and freeing the poorer class of tenants from their present dependence on private sources of credit.

d. In Ireland and Scotland special land courts were established for the purpose of determining fair rents and of settling disputes between landlords and tenants. Such special courts were found necessary partly because the existing court procedure was too cumbersome and expensive to be of service to poor tenants, partly because the regular courts were sympathetic with the landowner class, and partly because the cases involved require a special acquaintance with agricultural conditions not possessed by ordinary courts.

V. Methods of discouraging absentee ownership of farm

land. — There appears to be a general tendency to consider absentee ownership of farm land unwholesome, and this view is probably correct in the main, for most absentee owners give their tenants no aid in the way of supervision or credit, take little interest in improving their farms or in maintaining soil fertility, and contribute little to community life.

Probably the least undesirable form of absenteeism is that produced by the retirement of farmers, for farmers who retire usually remain in the neighborhood or move to a near-by town, renting their farms to relatives or at least retaining an active interest in management and upkeep.

No statistics as to the residence of the owners of rented farms have been issued since 1900. At that time it was found that of the reported owners of rented farms 78.8 per cent resided in the same county where the farm owned was located. It is probable that if owners residing in the county adjoining were also included the percentage would be ninety or more.

Legislation designed to restrict absenteeism must be framed with great discrimination. It has been proposed that a law be passed forbidding the ownership of a farm by any one who does not actually farm it. Clearly, however, the effect would be to prevent young men who have not sufficient capital to buy a farm from getting started as tenant farmers. Moreover, it would eliminate the helpful relationship to the business of farming maintained by so many landlords who have had long experience in farming. If absentee owners were taxed at a somewhat higher rate than resident owners this might discourage absentee ownership to some extent. It would be necessary to exempt from such discrimination persons temporarily absent from their farms on account of sickness and other legitimate reasons. A tax of this kind exists in West Australia and the province of Saskatchewan.

VI. Methods of restricting speculation in land. — There can be no doubt that a good deal of the most undesirable form

of absenteeism is the result of speculation in land by those who have no interest in farming it. However, there are various degrees of speculation in land. At the one extreme we have the man who buys a farm during a land boom in the hope of making a quick and profitable sale but with no idea of farming it. At the other extreme is the farmer who buys a farm mainly for the purpose of farming and having a home but incidentally counts on its increasing in value.

At times when land increases very rapidly in price, what is popularly called a boom occurs. People deal in land largely with an idea of making a quick profit, and these purchases and sales, having little relation to the actual earning power of the land, are likely to advance the price of land temporarily beyond its normal price. Such occurrences are wholly injurious to the community, disturbing the business of farming and unsettling credit conditions.

It has been suggested that land booms might be prevented by placing a heavy tax on resales of land within a certain period — say, six months or a year. Since most people during a boom buy with the expectation of reselling within a short time, a tax on resales might considerably discourage such activity, although it would have to be carefully drawn to prevent evasion.

However, much more important in its effect is the ordinary buying and selling of farm land for the purpose of farming it or renting it to others but with some expectation of a probable increase in price. It has already been pointed out that this tends to make the price of land higher than its present earnings justify and therefore deters tenants from buying farms of their own.

It has been suggested that these evils might be prevented by an increment tax — that is, a tax on the increase in value of land. This should be sharply distinguished from the single tax, which would appropriate also the present value of land. If a tract of land increases in price from $5,000 to $10,000 and

B buys it at the latter price, B has paid for the land. If after B has bought the land it increases from $10,000 to $15,000, the additional $5,000 may have been largely unearned by him. The single taxer would take the whole $15,000, but the increment tax would take by taxation only the increase which occurred after the land is purchased by a particular owner.

So conservative an economist as John Stuart Mill favored the taxation of the future increase in land value. Such a tax was passed in England in the famous "Lloyd George Budget," of 1909, but it was so drawn as to apply almost entirely to city land. A small increment tax is levied in the province of Alberta, but here also it applies mainly to city land. Germany, too, has made extensive experiments with increment taxes, and they have there been applied not only to city land but also to farm land. Our Federal income tax also involves an increment tax, for a profit due to selling land bought previously at a lower price is taxed as income.

No nation or state has attempted to take by taxation all the increase in the price of land. In fact, in Germany interest at four per cent on the original purchase price was allowed in calculating the increment subject to taxation, and even with these deductions only part of the remainder was taken by taxation.

There are many aspects of the subject of increment taxation that cannot here be considered. However, it should be said that such a tax carefully planned might be made an important part of a general system of land policy.

VII. Breaking up large land holdings. — Perhaps no condition occasions more popular dissatisfaction and unrest than a tendency for concentration in the ownership of land. Yet, as already suggested, the causes of concentration and circumstances of concentration differ widely. (See page 274.) Thus in the arid regions of the West where grazing is the principal industry, an area of 10,000 acres may be needed to make as good

a living as can be obtained from a quarter section farm in the Corn Belt.

The following methods of regulating the size of holdings may be considered:

1. *Legislation regulating inheritance.* — In England, as we have noted, concentration in landownership has partly been due to custom governing the inheritance of land and to the traditions which make the ownership of land in large tracts a means of acquiring social standing. It is probable that modifications in the law of inheritance would be one effective method of dealing with this condition.

2. *Graduated land taxes discriminating against large holdings.* — In New Zealand, some of the Canadian provinces, and the state of Oklahoma, taxes are levied at higher rates on large holdings than on smaller holdings, the object being to break up large holdings.

In many American states such a policy would be prevented by constitutional restrictions. In any case it should be employed with great caution, for there is a great deal of land not yet needed for agricultural purposes, such as forest land, cut-over land, swamp land, and large areas of arid land. If this land is to be held in reserve, some one must own it. If the state is not prepared to assume ownership it would seem to be good policy to permit its continued ownership in large tracts for a number of reasons. In the case of forest land or cut-over land that should be reforested and grazing land, large holdings are most economical. Moreover, large holders are probably better able to carry the burden of taxes than are small holders. In case the state should later find it desirable to pursue a systematic policy of settlement, it is easier to acquire a sufficient area from one or two large holders than from many small holders.

3. *State purchase of large holdings for redistribution.* — A more direct method of dealing with large holdings and a method

that is being employed in a number of European countries as well as in the Australian provinces, is for the state to purchase large holdings and to break them up into small holdings for sale to farmers on easy terms of credit. In Great Britain land may be condemned for this purpose, — that is, the state may compel the owner to sell to the state at a fair price.

VIII. Land settlement and resettlement. — It has been noted in a previous chapter that at a particular time economic conditions determine the amount of land that may be put to use in a given country. (See chapter XIV.) It is by no means desirable that all the land of a country be employed in farming, for to use more land requires additional labor and capital that may be more profitably employed in other ways. Moreover, to bring more land into cultivation than is justified by existing economic conditions might lower the return to labor and capital employed in farming.

1. *Special characteristics of the problem of expansion in the United States.* — The question may be raised whether there has not existed a tendency in the United States to force land into cultivation more rapidly than was justified by the existing demand for food and raw materials. Because of the expectation of an advance in land value many families have settled on new lands and employed their labor and equipment in production for a return lower than they would otherwise have been willing to accept. Railways, lumber companies, and other large holders of undeveloped land have been stimulated to dispose of their lands by the fact that their holdings are subject to taxes and by the fact that the money obtained from their sale could be yielding interest. If taxes and loss of interest be calculated at compound interest, the cost of holding land mounts rapidly.

The fact is that clever methods of salesmanship may be and are employed to induce people to settle on land which should not be brought into use.

It would appear that in the United States we do not need a policy of forcing land into use so much as we need a policy which would embody the following characteristics:

a. Regulation of the rate of expansion so that it may not proceed with undue rapidity.

b. Determination of the most suitable time for the expansion of the area of land in farms. It is a well-known fact that we have alternately periods of high prices and those of low prices. Usually, a wave of high prices stimulates a great expansion of the area of land in farms. Yet such a period is the worst possible time for expansion. The prices of materials, implements, and labor are very high, and, therefore, the costs of developing new farms are unusually high. By the time the farm is developed and ready to produce, the period of low prices is likely to set in and the percentage of failures among the new settlers will be very high.

c. Selection of lands most suitable for immediate use.

d. Protecting settlers on new lands from being deceived by land companies and other agencies whose eagerness to sell may lead them to disregard the future welfare of the settler.

e. Provision for the economical use of reserved areas by reforestation and grazing.

f. Provision for terms of credit and arrangements for equipment that will be most favorable to the success of settlers.

2. *Regulating methods of selling land in new regions.* — At the present time the sale of land to settlers in new areas is largely carried on by private agencies. Too many of these agencies find it possible to induce buyers to make disadvantageous purchases by employing subtle suggestions, by skillful omissions, and by other shrewd methods that do not constitute fraud in the legal sense. By such methods thousands have been induced to buy land that is poorly adapted to economical production or to pay too high a price for land that may be in other respects well suited for profitable farming.

Some positive steps should be taken to elevate the methods used in the sale of land. In Germany the government regulates the sale of farm land. Several American states, following the lead of Wisconsin, license real estate men with a view to regulating them. It may be doubted, however, whether a system of regulation has yet been devised which supplies adequate protection to the settler. Many American states maintain commissioners of immigration under various titles, but for the most part these officials occupy themselves merely with advertising the resources of their states — a form of advertising that sometimes conveys impressions as incorrect as those supplied by some private land companies. In Wisconsin notable progress has been made by the Commissioner of Immigration, Mr. B. G. Packer, in guiding settlers in the selection and purchase of land and in protecting them against unscrupulous agencies.

3. *Land colonization.* — When in addition to selling land to settlers special facilities are provided in the way of credit, farm improvements, and supervision, and especially when an attempt is made to establish the settlers compactly on a tract or block of land, as distinguished from selling widely scattered farms, the process may be called *colonization.*[1]

Colonization involves some or all of the following activities:

a. Selecting the land to be settled and dividing it into farms in accordance with a predetermined plan.

b. If necessary, reclaiming the land. This may involve irrigation, drainage, or clearing.

c. Providing roads, bridges, schools, and other public facilities, either directly or by inducing governmental agencies to do so.

d. Making certain preliminary improvements such as buildings and fences.

[1] Of course, in the broad sense, colonization includes any method of promoting the settlement of an area instead of leaving settlement to occur spontaneously.

e. Sometimes planting a crop such as alfalfa so that the settler may have a source of income from the beginning.

f. Selecting settlers with a view of obtaining those likely to make a success of the project.

g. Selling the land on favorable terms of credit, particularly by spreading the period of repayment over a long term of years.

h. Promoting the coöperation of settlers for production, marketing, and social life.

i. Furnishing such supervision and advice to settlers as may be needed to safeguard the interests of the colonizing agency and to promote the success of the settlers.

There is a great difference among colonizing agencies both private and public in the extent to which they undertake to perform these various functions, ranging from those agencies which merely sell land on easy terms to those which perform practically all the functions mentioned above, sometimes undertaking to provide ready-made farms. One fundamental fact that should be recognized is that how much needs to be done for the settler depends very much on the kind of settlers. Some settlers have very much more capital and experience than others.

Agencies of colonization may be private or public. In the United States these activities have for the most part been conducted by private agencies. The disadvantage of such agencies is that they are operated for profit, even when honestly conducted, and may, therefore, sell the land at so high a price that settlers have difficulty in meeting their payments. Various governments, including Canada, the Australian provinces, New Zealand, the Union of South Africa, Germany, and France have been engaged in the systematic colonization of land. In our country the state of California has been making interesting experiments in land colonization. Various proposals for a comprehensive policy of colonization have been considered by the Congress of the United States, but thus far no legislation

has been passed, with the exception of provision for the work of the Reclamation Service in irrigating desert lands.

4. *The redistribution of privately owned land.* — In England, Ireland, Denmark, and a number of other countries the problem of enabling farmers to acquire farms has consisted not so much in the opening up of new regions as in acquiring large estates for redistribution in small holdings. In many respects the requisite functions are similar to those involved in the colonization of new regions, as outlined above. In England the term "small holdings" is applied to tracts large enough to support a family entirely engaged in farming, while the term "allotments" is used for small tracts where laborers working for wages may live and be provided with a garden, poultry, and possibly hogs or a cow. The policy of laborers' allotments probably should be supplemented by a policy of low railroad fares and rapid transit from suburban districts to cities. Small holdings and allotments may be rented to the occupier or sold to him on easy terms. By these methods a large proportion of the rack-rented peasants of Ireland have been made landowning farmers.

IX. A liberal system of mortgage credit an important part of the general land policy. — It has already been suggested that liberal terms of credit are one of the important conditions of success in the settlement of new areas, as well as in the redistribution of privately owned lands. It is also important to recognize the fact that in every generation a large part of the developed farm lands need to be reacquired by purchase on the part of those who are to farm them. This aspect of the problem is considered in the following chapter.

X. Improvement of systems of land registration. — In many countries, especially old countries, the transfer of land is very difficult and expensive because it is necessary to trace back the title for many years in order to determine whether or not there are any unsatisfied claims. Some of these claims are registered, but others may not appear on the public-land

records. These conditions are an especial hardship to purchasers of small tracts, for it may frequently be as expensive to investigate the title of a small tract as it is to trace back the title of a large tract.

In 1858 Sir Robert Torrens introduced in Australia a plan of recording land titles which largely does away with the above-mentioned difficulties. The plan consists in bringing land titles up-to-date once for all and keeping them up-to-date. This plan is usually supplemented by an insurance arrangement which provides compensation to a buyer in case the title should prove defective. Under this method a certificate of title issued by the registrar of land titles is sufficient evidence of the seller's title to land.

This excellent system has been adopted in principle, though with varying details, in many countries and in eleven American states.[1] Obviously, it is more difficult and expensive to introduce the system in an old country than in a new one, but on the other hand it is likely to be more needed in an old country than in a new one.

XI. Policy of disposing of the public domain. — When a state or nation owns a large area of land suitable for farming, its most important land problem is how to dispose of this land to the best advantage. This has been the land problem with which we have been chiefly concerned during the greater part of our history.

At present our nation still owns nearly two hundred million acres, but it is for the most part land of such inferior quality that comparatively little of it is likely to be employed for farming for many years. Consequently, this problem of disposing

[1] Victoria, New Zealand, New South Wales, Tasmania, Fiji, Honduras, Queensland, Java, Morocco, British Honduras, British Columbia, England, Switzerland, Saskatchewan, California, Colorado, Illinois, Massachusetts, Minnesota, New York, Ohio, North Carolina, Oregon, Washington, Tennessee.

of public lands is likely to be displaced in public interest by some of the other land problems already discussed.

The most important problem of public land at present, as far as agriculture is concerned, is the problem of dealing wisely with the arid lands of the West. For a long time the homestead and sale units were kept as small as they had been in humid regions (160 acres), in spite of the fact that a family could not make a living on so small an area in semiarid and arid regions. From time to time, as settlement has advanced into these regions, the maximum limit has been increased, first to 320 acres, then to 640 acres, but always the maximum has been far too small for a family living. The great mistake has been in a failure to classify the land and apply restrictions as to size of homestead adapted to the conditions of production in the region. A policy of classification has been lately employed, but it is probable that the rigid maximum unit allowed (640 acres) is still too small for a family farm unit in most of the unsettled regions. To a large extent, also, homesteaders have been permitted to take up small tracts of land unsuitable for permanent farming but to the great detriment of the established ranching industry. There has also been no adequate provision for the regulation of grazing on public lands, although such a policy exists in the national forests. The development of a policy of regulating grazing on the public lands would add many millions of dollars annually to the efficiency of the grazing industry.

QUESTIONS ON THE TEXT

1. If all the farm land were nationalized, would tenancy be decreased or increased? Explain.
2. Would the system of tenancy under national ownership necessarily be better from the standpoint of the farmer? From the standpoint of the nation as a whole? Explain.
3. What functions are now performed by private landlords which would have to be performed by the nation under a system of land nationalization?

4. Would the farmer pay less rent under land nationalization?

5. If all farm land were confiscated by the government, would the distribution of wealth be more nearly equal than at present? If the nation purchased all farm land by paying the present selling value to the owners, how would the distribution of wealth be altered?

6. What are the advantages from the standpoint of the nation of private ownership of land?

7. Are these advantages as great when the land is not owned by the farmers as would be the case if the land were owned by the farmers?

8. What is the single tax, and how does it differ from land nationalization?

9. Would landowning farmers lose or gain by the sudden application of the single tax in its extreme form? How would tenants benefit?

10. It is claimed that the value of land is an unearned value. Is this more true of land than of other forms of property so far as the existing owners are concerned?

11. Explain the argument that no serious loss would be suffered by landowners if the tax were gradually imposed.

12. Would the single tax tend to force new farm land into use? Explain. Would such a result be desirable?

13. Would the single tax stimulate the improvement of farm land?

14. Would it discourage the waste of soil resources? Why?

15. Is it probable that under the single tax it would be easier to become a farm operator than it is at present?

16. Distinguish the single tax from other special taxes on land, and name the various kinds of the latter.

17. What are the various aims that should be involved in a national land policy?

18. In what ways can the relationship of landlord and tenant be improved?

19. Describe the policy of compensation for improvements.

20. Discuss the problem of remedying abuses that prevail when tenants are a distinctly inferior class.

21. By what measures may absentee landownership be restricted?

22. Distinguish between an increment tax and the single tax. Where has the former been employed?

23. Discuss the problem of taxing the increment in the value of land.

24. By what methods may large land holdings be reduced?

25. What are the reasons for the tendency in America to expand too rapidly the area of land in farms?

26. What are the principal aspects of a policy of land settlement?

27. Discuss the problem of regulating the sale of land by private agencies in new regions.

28. What is land colonization? What are the principal functions that may be undertaken by colonization agencies?

29. What are the principal characteristics of the Torrens system?

30. Describe the problem of the arid public lands of the Western States.

SPECIAL PROBLEMS

1. Write an essay based on your reference readings describing the enclosure movement in England.

2. Describe the land reforms in Russia during the last half of the nineteenth century.

3. Prepare tables from the Census of 1900 showing for each important division of the country (*a*) the number of farm owners owning one farm, the number owning two farms, etc.; (*b*) the number of farms owned by those owning one farm, by those owning two farms, etc.; (*c*) the number of owners classified by acreage owned; (*d*) the number of acres classified by size of holdings. Reduce all your figures to percentages, compare them, and state the conclusions which seem to be indicated.

4. From the same census prepare tables showing for each important division of the country the number and percentage of farms owned by dwellers in the same county and by dwellers within the same state.

5. Write a short essay describing the English system of compensation for improvements made by tenants.

6. Summarize the principal steps in the development of our national land policy, so far as it applies to agricultural land.

7. Prepare a brief essay describing the methods by which the evils of landlordism in Ireland were largely overcome.

8. Prepare a brief account of increment taxation in Germany.

9. Write a short description of graduated land taxes as employed in (*a*) New Zealand; (*b*) western Canada.

10. Prepare a short statement summarizing the experience of England with the small holdings and allotments acts.

11. Describe the state system of colonization in California.

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CHAPTER XVII

AGRICULTURAL CAPITAL AND CREDIT

I. Agricultural capital
   1. Definition of capital
   2. Agricultural capital in the United States
   3. Is money capital
   4. Capital the result of saving

II. Nature of credit

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4. Federal Farm Loan System

I. Agricultural capital. — 1. *Definition of capital.* — In economics the word *capital* is used in many different ways. In the present chapter *capital is used to mean the value at a given time of the factors of production employed in the business of farming.*

At a given time the capital which a farmer employs will consist of such items as the value of his land, permanent improvements, machinery, live stock, supplies on hand, growing crops, unsold crops, and ready money kept for the purpose of paying current expenses.

2. *Agricultural capital in the United States.* — In 1850 the average value of all capital per farm was $2,739; in 1910 it was $6,444; and in 1920, $12,085. In part, this increase from 1850 to 1920 has been due to the use of more implements and live stock and other materials of production, but mainly it has been the result of the increase in the prices of the various factors and especially in the price of land. In 1920 land was 70.4 per cent of the total farm capital, buildings 14.7 per cent, implements 4.6 per cent, and live stock 10.3 per cent.

3. *Is money capital?* — From the standpoint of an individual farmer the money which he needs to keep on hand in order to pay current expenses or to purchase any of the various factors of production needed to operate a farm is capital. From the national standpoint, however, it is a great mistake to consider that money is capital. In the nation as a whole merely increasing the amount of money does not increase the amount of horses, land, machinery, and buildings. Doubling the supply of money merely increases the prices of these goods without increasing their quantity.

4. *Capital the result of saving.* — The individual can increase the amount of property which he owns, including money

and bank deposits, in various ways, but one of the important ways is by saving, and however he may have acquired his property, he can keep it only if he refuses to spend it all for his own gratifications. The nation's capital also is maintained and increased by saving and investment. Horses, machinery, live stock, and all kinds of improvements and equipment are the results of the saving and investment as well as of the labor of the people of the United States.

II. Nature of credit. — Let us suppose a farmer owns his land and buildings but needs money to buy live stock and machinery. Some one may lend the farmer money to buy the machinery and live stock which he needs, taking a mortgage on the farm as security. The farmer agrees to return the money after a certain time together with interest. Now in reality, this amounts to converting temporarily part of the value of the land which the farmer owns into machinery and live stock, while allowing the farmer to retain the use of his farm.

Ordinarily it would be difficult for the farmer to find some one willing to take a mortgage on the farm who at the same time has all of the things the farmer needs to buy. The farmer needs to find some one who will lend him money or general purchasing power, taking the land as security. With the money the farmer can get what he requires. This illustrates a function of credit — to convert valuable property which is not capable of being used for general purchasing into general purchasing power, that is, to make it "liquid."

Let us assume another case. Suppose a young man with farming experience, energy, and good judgment has no capital whatever and that there is another man in the same town with plenty of money who does not want to farm. This man may lend his money to the man who can employ it, probably taking as security the property which the young man purchases. This transaction illustrates a second function of credit; namely, to transfer the use of capital from the man who has it but who

does not want to employ it in active production to the man who has it not but can and will make use of it. Bankers and other agencies of credit perform an important function in gathering up unused capital in small and large amounts as deposits and lending this capital to those who will employ it productively.

Another function of credit is the equalization of the use of capital. Various producers have need for more capital at one time of the year than at other times. Let us suppose each of three firms needs $15,000 for four months of the year and only $10,000 for the remainder of the year and that the three firms require the maximum amount at different seasons. If the three firms arranged to use $5,000 jointly in succession, each firm passing on the $5,000 when it was through with it to the next business, it is clear that the capital required for all three would be only $35,000 instead of $45,000. There has been an economy of capital. Instead of each business having to pass the $5,000 on to some other business, the bank lends the $5,000 to each business in turn as the need arises.

Still another function of credit is to enable a producer to anticipate a future return. Suppose a farmer has planted a crop of wheat which will not be ready to market for four months and that this crop is fairly certain to yield from $1,200 to $2,000. If the farmer needs the money immediately, he may be able to anticipate this income by getting some one to advance him part of it. This is an exchange of present goods for future goods. The lender exchanges, say, $1,000 now, or what it will buy, for $1,050, or what it will buy four months from now. The $50 is what is called interest.

III. The bases of credit. — There are several bases of credit, as follows:

1. *On property given as security.* — In the first place, we may recognize that one of the foundations of credit is the goods which are given as security for a loan. It is usually not customary to make a loan up to the full value of the security given.

The difference between the amount loanable and the value of the security is called the *margin of security*. It is important that there shall be such a margin, for in the case of land and other goods it is frequently difficult to be exactly sure what the present value is. Moreover, before the loan has been repaid the value of the security may shrink or the security itself may be destroyed by fire or other cause.

2. *Business integrity.* — Credit, however, is based not wholly on the security of property but partly on what may be called the *business integrity* of the borrower. Business integrity includes not only the honesty of the individual but also his business judgment and experience and the promptness with which he meets his obligations. Even when property is given as security for a loan and when there is sufficient margin of security business integrity still plays a large part. Lenders do not usually desire the property given as security, and the legal process of foreclosure is costly, time-consuming, and troublesome, frequently leading to hard feeling. Promptness in repaying is all-important, for the lender relies on the promised payments to meet his own obligations.

Good business men value highly this reputation for credit, for it gives them great advantages in securing capital.

3. *Credit ratings and lines of credit.* — It is customary for those who grant credit to give a business man a *credit rating*, which consists of an estimate of about how much the individual is worth and also an estimate of his "goodness" from the standpoint of business judgment, promptness in meeting obligations, and general reputation.

It is customary for a bank to extend what is called a *line of credit* to a business man. That is, on the basis of his credit rating the bank specifies the maximum amount that he may expect the bank to lend him. While the bank does not promise to lend this amount at any time, the business man knows how much he may usually count on in the way of credit.

The businesslike farmer should get his banker to give him a rating and line of credit because it enables him to know what to expect in the way of credit accommodations, and, moreover, he establishes confidential relations with his banker which will be helpful in many ways.

Before farmers can expect bankers to give them a line of credit they must be able to explain to the bankers the details of their business. Nothing will inspire more confidence than the keeping of systematic accounts. Of course, there are many farmers who are not entitled to a line of credit because of poor business judgment or because they have a reputation for dishonesty or for lack of promptness in meeting obligations.

IV. Credit needs of farmers. — In some sections one finds farmers who do not have enough to live on from one season to the next while making the crop and who have to get some one to advance them the means of livelihood. The security for the loan is the farmer's labor, and labor is poor security, for it is subject to be destroyed by accident, disease, or death and also by the unwillingness of the laborer to work. These conditions account in part for the practice of peonage, or compulsory labor, on some Southern plantations.

When such loans are made the growing crop is also commonly regarded as security for the loan. Crops, however, are notoriously uncertain both as to yield and price. Consequently, farmers who have no other basis of credit than their labor power and their share of growing crops usually find that they must borrow under very hard conditions indeed.

A less unfavorable condition for obtaining credit is when the tenant farmer has enough to live on while making his crop but needs money to purchase machinery and work stock and even for seed, fertilizer, and other crop expenses. Still other farmers own their operating capital and have enough to live on while making a crop but lack part or all of the money necessary to buy and own a farm.

If a farmer invests his capital in a binder, he expects that it will earn enough to pay interest on the investment and also to replace the original sum invested in the binder. The period during which the binder will last may be called its *productive period.* There is a relationship between the productive period and the length of the period for which the farmer should be granted credit. For instance, since binders, tractors, and work stock are not used up for a number of years, it is foolish to expect the farmer to borrow money to buy them with the expectation that he can pay the entire debt in one season unless he expects to pay it from other resources. On the other hand, it might not be good business to give such a farmer twenty years to pay back a loan which is to be used in buying a tractor that will be used up in possibly five years.

From this standpoint we may divide the farmer's credit needs into three groups — short-time, or seasonal, needs; long-time needs; and intermediate needs.

1. *Short-time, or seasonal, needs.* — The farmer has certain seasonal needs for credit. In the spring and summer when he is planting and cultivating his crops, he needs extra money for seed, fertilizer, hiring labor, etc. Similarly in some sections farmers have a surplus amount of stock feed in the fall and need extra capital to purchase live stock to consume this feed. As already pointed out, some very poor farmers require seasonal loans to enable them to live.

Farmers' needs for short-time credit are usually from the beginning of the crop year until the crops are sold. This period varies from six months to a year in length. It is not fair to expect farmers to sell their crops as soon as they are harvested, for such a time may not always be most favorable for selling. *Of course, farmers should be very cautious in the practice of holding their crops, for this is essentially speculation.* However, they should have credit available to enable them at least to hold their crops until the most convenient time to market them.

2. *Long-time credit.* — Long-time credit is principally needed for buying land, for putting up buildings, silos, fences, water systems, and for drainage, irrigation, and clearing land.

3. *Intermediate credit.* — Between short-time and long-time credit comes intermediate credit. The principal needs for intermediate credit are for the purchase of machinery and work stock, setting out of orchards and vineyards, and the purchase of live stock and feed when the feeding process extends longer than a year.

V. Sources and agencies of short-time credit. — 1. *Private money lenders.* — Private money lenders are the most important sources of all kinds of credit before the regular agencies of credit develop. Each contract is the result of a special bargain between the borrower and the lender, and the terms are likely to be liberal or otherwise according to the necessities of the borrower and his ability to make a good bargain. These conditions may afford opportunity for the "loan shark."

2. *Storekeepers, machinery companies, and other sellers of goods* frequently sell goods on credit to farmers. This kind of credit is frequently more costly than credit which is obtained from banks and other regular agencies of credit. Sometimes even when the terms of credit seem liberal the buyer is paying dearly because he has been charged a higher price for the goods than if he had paid cash. However, these agencies frequently serve an important purpose by assuming risks in supplying credit which bankers will not undertake.

3. *Warehousemen, commission men, and crop buyers.* — Sometimes middlemen engaged in marketing or storing crops, such as tobacco warehousemen or live-stock commission firms, are the agencies which furnish credit to the producer, but this may lessen the producer's freedom in selling his crops.

4. *Landlords.* — Landlords may make advances to enable the tenants to live from year to year while making the crop. Sometimes the landlord supplies only the land, and the tenant

obtains credit from a merchant, the merchant taking as security the tenant's share of the crop. In some cases the landlord guarantees the loan.

5. *Commercial banks — their principal functions.* — Some banks are called *commercial* to distinguish them from savings banks, trust companies, mortgage banks, and other agencies of long-time credit. Although developed mainly to supply credit for commercial rather than farming purposes, such institutions, especially the country banks, have been modified to enable them better to meet the needs of farmers.

Commercial banks have a number of important functions, as follows:

a. To receive deposits. — Originally the principal function of banks was to keep safely the money deposited with them by their clients. In early times banks made a charge for this service.

b. To make loans. — Gradually banks found that they could make a profit by lending the deposits of some people to others, hence they no longer needed to make a charge for keeping deposits but began to seek them.

Even though the bank agrees to return deposits on demand, it has been found by experience that the bank can safely lend a part of these deposits because not all of them will be called for at once. It is customary, therefore, to keep on hand enough money to repay any probable demand on the part of depositors. This is called the *reserve.*

c. To issue notes. — If the bank is a "bank of issue" it may be able to issue its own notes to those who borrow from it and to those depositors who are willing to take the bank's notes in place of money. This is really a substitution of the bank's promise to pay for the borrower's promise to pay. If people have confidence in the bank and especially if the bank notes are made to resemble money in appearance, they will circulate readily and comparatively a small percentage at any given time

will be returned for redemption. The bank has really manufactured credit by taking the borrower's probable ability to pay three or six months from now as determined by a careful investigation of his affairs and has given it general purchasing power *now*.

It is clear that this practice implies general confidence in the bank. Through the National Banking Law, passed during the Civil War, and later by the Federal Reserve Law, restrictions were placed on bank note issues and guarantees established so that now one does not have to investigate the bank which issues a note but can take the note of any bank with entire confidence.

d. To create deposits based on loans. — In early days deposits consisted only of money deposited in a bank by others. The greater part of modern deposits due on demand are not made in this way but consist of credits on the books of banks created by making loans to borrowers. Thus the borrower gives his note for $1,000 due in three months to the bank, and the bank gives him credit for a deposit amounting to, say, $985. This is called *discounting* the note because the interest on the loan (discount) is deducted in advance. Consequently, the volumes of loans and demand deposits tend to increase or decrease together, for when people are increasing their borrowings they are also increasing their deposits, and when they are paying off their debts to banks they are reducing their deposits.[1]

6. *Relation of reserves to deposits.* — At any given time the ordinary commercial bank is potentially insolvent. It could not pay in cash all of the obligations due on that day, for, as has been explained above, the obligations of the bank consist largely of deposits nominally due on demand, while the assets consist only in small part of money on hand but largely of notes given

[1] Commercial banks perform other functions, such as clearing checks, making collections for their customers, regulating the supply of currency, etc., but it is not possible to discuss in full these other functions in the present chapter.

by customers in return for loans on deposit credits. Many of these notes are not due for several months. However, if the bank has been properly managed, it not only has sufficient assets in the form of debts due it by others which will be payable in the course of a short time, but it also has its capital, surplus, and undivided profits in addition to these credits. If most of the loans made by the bank are due in a short time, it is clear that it will not have to keep on hand so large a reserve as if it had made its loans for a longer period.

Obviously, the amount that it will be safe for the bank to keep in reserve if it stands alone is very much greater than would be necessary if its reserves were pooled with those of a considerable number of banks. Great progress has been made in this and other countries in establishing arrangements which will strengthen individual banks by enabling them to rely on the reserves of other banks. In our own country this is provided for by the Federal Reserve System. In each of twelve districts there is a Federal Reserve Bank with which the various banks in the districts deposit reserves not immediately needed and on which they may draw for ready money to meet sudden demands for the payment of deposits. Banks may also build up their reserves by rediscounting with the district bank some of the notes which they hold in exchange for ready money.

7. *Short-term coöperative credit.* — In various countries the need for short-term credit, as well as the need for what has been called "intermediate credit," has been met by coöperation. The Raiffeisen credit associations in Germany, first established by Frederick William Raiffeisen in 1849, have been the models after which most of the European systems of short-term coöperative credit have been patterned. Each society consists of farmers and other people in a local community personally acquainted with one another. Members are associated on the principle of unlimited joint liability — that is, each member is personally liable for all the debts of his local society. Generally,

no entrance fee is required of members, and no stock is issued, although in some parts of Germany the issue of stock is required by law. The funds available for loans consist largely of deposits made by members and of funds obtained by borrowing from other persons or institutions on the credit of the local association. After the local associations had increased in number, central banks were formed as a means of supplying the needs of local associations for loans and of equalizing the distribution of loanable funds in different sections of the country.

The loans, made only to members, extend for periods ranging from ninety days to three years, thus partly supplying the need for intermediate, as well as for short-term, credit. In fact, these coöperative banks do not carry the large percentage of demand deposits characteristic of commercial banks and consequently do not have to confine themselves to short-term business.

The government of these associations is exceedingly democratic, being composed of a committee of management and a council of supervision, both chosen by the members of the association. There is only one paid official — the secretary-treasurer, and he usually receives but a small sum.

These societies are conservative in methods of doing business. The buildings and equipment are usually of the simplest character and every attempt is made to curtail expenses of operation. They select their own members, excluding persons of ill repute, avoid loans for speculative purposes, and see to it that the proceeds of loans are wisely expended for productive purposes. The total indebtedness of the association is limited by agreement of the membership. No profits are distributed and all net earnings are used to build up a reserve fund.

One important characteristic of the Raiffeisen system is that it includes an arrangement by which members not only borrow cash but also buy goods on credit. Coördinate with the credit associations and also frequently doing business in the same

building and under the same manager are the coöperative supply associations which furnish their members various farm supplies on credit.

Other systems of coöperative short-term credit in Europe resemble the Raiffeisen system in general character, though differing considerably in details. Some important systems, for instance, the people's banks of Italy, established by Signor Luzzati, employ the principle of limited, rather than unlimited, liability.

In the United States coöperative short-term credit has made but little progress, although in the past few years there have been numerous plans presented both to Congress and to the various state legislatures, and at the present time seventeen states have passed legislation providing in one way and another for coöperative short-term credit.

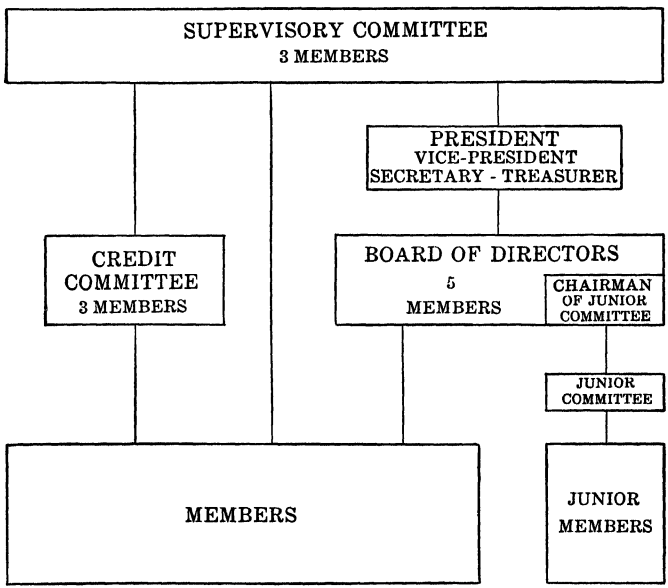
The principal form has been the credit union, modeled in part after the people's banks of Canada, which in turn are similar in general character to those European coöperative short-term credit systems characterized by the principle of limited liability.

In 1921, ten American states had enacted laws providing for credit unions. However, notable progress in the development of such associations has been made in only four states — Massachusetts, New York, North Carolina, and Rhode Island. The reason seems to be largely because in these four states either a public or a private agency has assumed responsibility for propagating and guiding the development of the local associations, while in the other states there has been no such directing agency. Only in North Carolina is the system strictly rural. At the beginning of the year 1921 there were thirty-three credit unions in that state.

North Carolina associations are organized on the basis of capital stock, but the par value of the shares is small, and the dividends limited to six per cent, and the accumulation of a

reserve usually precedes the payment of dividends. The associations receive savings deposits from members. The sources of loans are the capital, surplus, and deposits. A union is allowed to borrow from the banks to a limited extent when the

INTERNAL ORGANIZATION OF A CREDIT ASSOCIATION



Department Circular 197, U. S. Dept of Agr.

FIG. 60. — CHART OF THE PLAN OF ORGANIZATION OF A NORTH CAROLINA CREDIT UNION

demand for loans outruns the supply of funds available in the association. One unique feature is the provision for junior members in order to encourage the habit of thrift among children.

Experience has shown that something more than legislation is necessary to establish a system of coöperative short-term credit. Such a system must be actively propagated. In America conditions are not so favorable to such a system as in Europe, where there are numerous peasant farmers in the same economic and social scale, living in close proximity and fully acquainted through years of residence, moving infrequently, and with little of the spirit of speculation. The better class of farmers in the North are fairly well supplied with bank credit and peculiarly loath to submit their business affairs to inspection and regulation by their neighbors.

The more prosperous class of farmers in the United States are unlikely to consent to the principal of unlimited liability and the close supervision of their expenditures characteristic of European associations. On the other hand, the poorer class of farmers, especially of the South, probably need a system of coöperative credit which will include not only joint unlimited liability but also much of the close supervision and control of expenditures characteristic of the present credit system in the plantation districts, combined with arrangements for using this credit as a basis for coöperative supply. It is probable that any credit system adapted to their needs would involve to a certain extent compulsory or semicompulsory thrift.

When this book was preparing (1923), Congress passed legislation of far-reaching importance to provide for the short-term and intermediate credit needs of farmers. This legislation, popularly known as the "Lenroot-Anderson Bill" and the "Capper Bill," establishes two sets of credit machinery for the purpose. First, arrangement is made for extending the machinery of the Federal Farm Loan System (see p. 348) to the provision of intermediate credit for farmers. Second, private banking corporations are provided for under certain specified conditions. It is too early to judge accurately the effect of this legislation, but unquestionably it will greatly

improve the credit facilities available to the farming industry.

VI. Long-term, or mortgage, credit. — 1. *General characteristics of farm mortgage credit.* — In the United States the line between short-term and long-term credit has not been clearly drawn in the past. Farmers have borrowed on the basis of mortgages in order to supply the need for short-term credit, and they have sometimes used short-term credit for the purpose of buying and paying for land. Moreover, the institutions supplying the two classes of credit have not been sharply distinguished. Country banks have to a considerable extent loaned money on land mortgage security. In 1915, nine per cent of the loans made by commercial state banks were farm mortgage loans. Under the Federal Reserve Act such loans are permitted up to twenty-five per cent of the bank's capital and surplus or thirty-three per cent of the deposits.

New agricultural regions are usually less well provided with farm mortgage credit than old established regions for a number of reasons — because the methods of agriculture are in an experimental stage, because the land values are not so definitely established and include a large element of speculative value, and because the demand for credit in such regions largely outruns the supply of loanable funds that move to such regions.

The readiness with which private capital is loaned on farm mortgages and the costliness of the loans depend on the degree of uniformity in the agriculture of a region. Large organizations engaged in the lending of funds, as, for instance, insurance companies, are more inclined to lend in regions where soil and topography are fairly uniform than in regions where there is great diversity, for the problem of valuation and of estimating the degree of hazard is very much greater than where farming conditions are more nearly uniform.

2. *Farm mortgage loans in the United States.* — In 1890, 28.2 per cent of the farms operated by owners reported mort-

gage indebtedness, while in 1910 the percentage was 33.6, and n 1920, 41.3. In 1890 the amount of mortgage indebtedness on owned farms was $1,085,995,960; in 1910 it had increased o $1,726,172,851; and in 1920, to $4,003,767,192. From 1910 to 1920 the average debt per farm increased from $1,715 o $3,361. The ratio of mortgage debt to farm value declined rom 35.5 per cent in 1890 to 27.3 per cent in 1910 but increased o 29.1 per cent in 1920.[1]

Extensive farm mortgage indebtedness is not necessarily an evil indication. Farm mortgage indebtedness is greatest n those sections where the most progressive agricultural meth-ods, the best land, and the most prosperous farmers are found. This is the case because in these regions land has changed hands most frequently, involving loans for land purchase; farms have ncreased in size in order to make possible more economical use of equipment; and farmers have been alert to enlarge their capital to include modern machinery, pure-bred live stock, and convenient farm improvements. Moreover, these regions of good land, of fairly uniform quality, and of progressive business-ike farmers are the regions in which lenders have been most eager to place their money.

3. *Private agencies engaged in making farm mortgage loans in the United States.* — The private money lender is still a very important source of credit, especially in old established and wealthy farming regions. A recent investigation in Dane County, Wisconsin, showed that only six per cent of the mort-gages of the county were made by banks and 8.4 per cent through them. Less than four per cent of the money in mort-

[1] The basis of the statistics for 1890 is somewhat different from that for later dates, in the first instance being "owned homes" and in the second, 'farms operated by owners." However, it is believed by census officials that the statistics are comparable. The United States Census publishes statistics of farm mortgages for those farms occupied by owners and part owners but not for farms occupied by tenants.

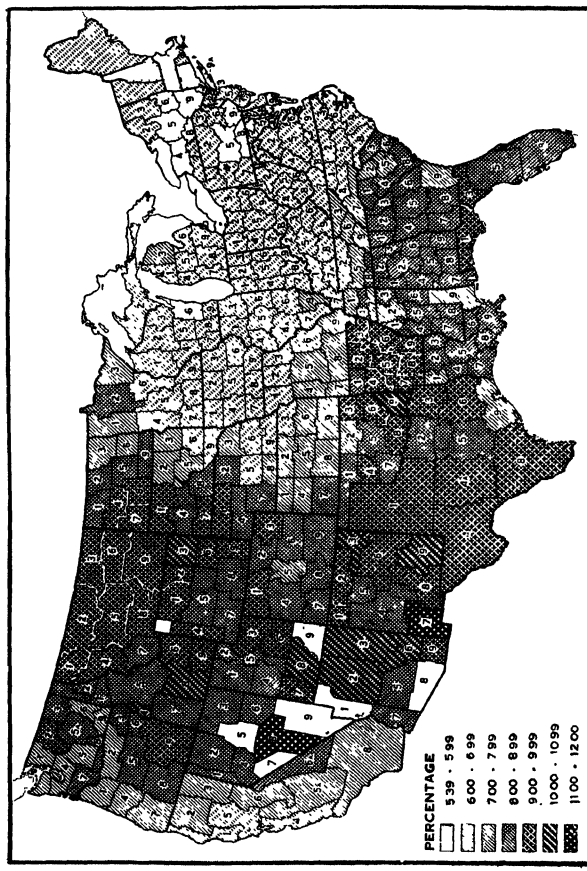
gages was furnished by trust companies, investment companies, and insurance companies.[1]

However, in certain regions outside agencies of investment have been important sources of mortgage loans. According to a study made in 1920, life insurance companies held fourteen per cent of the total farm mortgage debt of the United States, and banks (including commercial banks, savings banks, and trust companies) held seventeen per cent. About five per cent was held by Federal and joint-stock land banks, one per cent by state agencies, and three per cent by mortgage bankers.[2] Probably the greater part of the remainder was held by private investors.

There are great differences in the terms under which mortgage loans are made in different parts of the United States. In many cases, in addition to the rate of interest charged on the loan, there is a commission charged at the time the loan is made or renewed. Theoretically, this commission is supposed to defray the cost of making and renewing the loan. Actually, it frequently is a method of charging additional interest, except that it is paid at the time the loan is made or renewed and not annually. Consequently, to determine the annual cost of a loan to a farmer, it is necessary to add the rate of interest and the average annual charge for commission. In a study of farm mortgage credit made in 1915, it was found that the sum of the two charges was under six per cent in all the New England States, except Maine, in all the Middle Atlantic States, in Delaware, Wisconsin, and Iowa. In most of the Middle West, the combined rates averaged six to seven per cent. In all the Mountain States and in all the Pacific States, except California,

[1] Hibbard, B. H., and Robotka, Frank, "Farm Credit in Wisconsin," *Bulletin 247*, Wisconsin Experiment Station, p. 22.

[2] Valgren, V. N., and Engelbert, Elmer E., "Farm Mortgage Loans by Banks, Insurance Companies, and Other Agencies," *Bulletin 1047*, United States Department of Agriculture.



Department Bulletin 1047, U S Dept. of Agr.

FIG. 61. — RATES OF INTEREST ON FARM MORTGAGE LOANS IN VARIOUS CROP-ESTIMATING DISTRICTS OF THE UNITED STATES. (The figures on the map represent the numbers of the districts.)

the average combined rate was from nine to ten per cent. In practically all the states of the lower South the combined rate averaged from eight to nine and one-half per cent.[1]

There has long been a need for a method of standardizing farm mortgage loans so that they will be readily salable in the large money centers in order that investors need not have money tied up until the termination of the mortgage but may readily get their money out of the investment by selling.

This standardization has been prevented partly by the great variation in state laws governing mortgage loans, methods of foreclosure, exemptions from foreclosure, and methods of taxation. The distant investor cannot investigate conditions on a particular farm in a distant state. Moreover, if the investor holds a mortgage and wishes to get his money out before due, he finds difficulty in selling because prospective buyers do not have opportunity to investigate.

In Europe this need was first provided for by the *Landschaften* — associations of borrowers, which issued their interest-bearing bonds to their members, taking their individual mortgages as security. The bonds were readily sold by the borrower. Later, provision was made to sell the bonds for the borrower and to turn over to him money instead of bonds.

Another phase of European credit systems which proved to be an important suggestion for the improvement of American farm mortgage credit was an arrangement for repayment on the amortization plan. In America the general plan has been to agree to repay the loan all at once at the end of three to five years. A farmer can normally save enough only when he has extraordinary good fortune. Under the amortization plan a part of the principal is repaid each year, and the repayment is spread over a long term of years, sometimes as long as sixty-eight years, but with the privilege of repayment at earlier

[1] Thompson, C. W., "Costs and Sources of Farm Mortgage Loans," *Bulletin 384*, United States Department of Agriculture.

dates if desired. The payments are calculated so that the borrower pays the same amount each year to cover both interest and principal. Of course, with each successive payment the share of the payment for the principal becomes larger and that for interest smaller.

These important improvements in farm credit had already been adopted in the United States by a few banks and trust companies but were not in general use until incorporated in the Federal Farm Loan System.

4. *Federal Farm Loan System.* — The Federal Farm Loan System was established in 1916. Being the result of a compromise on the part of those who desired coöperative systems and those who urged private enterprise, it sets up two separate kinds of machinery for making loans to farmers — the one a system of coöperative associations, the other a system of private joint-stock land banks. Both systems are somewhat similar in methods of making loans as required by the law, and both are under the general supervision of the Federal Farm Loan Board at Washington.

Under the coöperative system the United States is divided into twelve land bank districts, in each of which is a district land bank. This land bank supervises the appraisal of land offered as security for mortgages and the legal details under which the loan is made. On the basis of the mortgages which it holds as security it issues bonds from time to time up to twenty times its capital stock as a means of getting funds to lend to farmers. Farmers who desire to borrow through the land bank may form a local coöperative association composed of not less than ten would-be borrowers. Each member is required to subscribe to stock up to five per cent of the value of his loan, the stock subscription being payable out of proceeds of the loan. If no association is formed in a county, the district bank may designate a local bank to negotiate with would-be borrowers in making a loan.

The joint-stock land banks are private institutions which may lend anywhere in the state in which they are located and in one adjoining state. They are permitted to issue bonds up to fifteen times the amount of their capital stock.

Both the Federal land banks and the joint-stock banks lend under substantially similar arrangements provided by law. Both issue bonds and are required to lend to farmers at a rate of interest not to exceed one per cent on the principal above the rate of interest which must be paid on the bonds, the excess to cover the costs of making the loan and other operating expenses. All loans are made on first mortgage security and are not to exceed fifty per cent of the value of the land and twenty per cent of the value of the improvements. Under the present law a borrower can ordinarily obtain not more than $25,000, and the proceeds of loans must be employed for productive purposes. The loans both of the Federal land banks and the joint-stock banks are exempt from taxation.

Although the system may be further perfected, it has greatly improved the farmer's credit conditions, especially by providing longer periods of repayment and lower rates of interest.

There are some who criticize the system because it does not go far enough. It is pointed out that it is so conservative that it does not help the tenant farmer. A recent study indicates that up to November 30, 1919, only thirteen per cent of the amount loaned by Federal land banks was for the purpose of purchasing farm land, the greater part of the loans having been used to pay off old indebtedness or to make improvements. Of 2,054 borrowers who obtained their loans in order to purchase land only 36.6 per cent were tenants and only about twenty-three per cent were tenants who did not already own some farm land.

It is probable, however, that the Federal Farm Loan System as now established is fairly satisfactory for the kinds of services it is attempting to perform, and that if provision is to be made

for assisting tenant farmers to purchase land, a system of second mortgage credits should be set up. This system should probably be supplementary to the present Federal Farm Loan System.[1]

QUESTIONS ON THE TEXT

1. What was the average farm capital in the United States in 1920? What percentage of the average farm capital represented the value of (*a*) land? (*b*) buildings? (*c*) implements and machinery? (*d*) live stock?
2. Is money capital from the standpoint of the individual farmer? Are all kinds of money capital from the standpoint of the nation? Explain.
3. "Horses, machinery, and live stock are the result of saving." Is this true? Explain.
4. Mention and explain each of the main functions of credit.
5. What are the bases of credit?
6. What is a credit rating? A line of credit?
7. What is meant by the productive period, and what is its relation to the period of credit?
8. Distinguish between short-time credit, long-time credit, and intermediate credit, and indicate the principal kinds of needs for farm capital which may be assigned to each class.
9. Mention some of the important kinds of agencies which supply credit to the farmer.
10. Mention the principal functions of commercial banks.
11. How does a bank create deposits by making loans?
12. In what sense is it true that a commercial bank is always potentially insolvent?
13. What is a bank reserve? Why is it desirable to centralize bank reserves?
14. Why is it necessary for a commercial bank to keep its assets liquid?
15. Describe the Raiffeisen coöperative credit associations.
16. What is the difference between associations of unlimited liability and associations of limited liability?
17. Describe the North Carolina credit unions.

[1] For discussion of this problem, as well as for the sources of the above mentioned figures, see "Buying Farms with Land Bank Loans," by L. C. Gray and Howard A. Turner, *Bulletin 986,* United States Department of Agriculture.

18. Discuss the problem of providing short-time credit for the poorer class of farmers.

19. Is the increase of farm mortgage indebtedness in a given region necessarily an evil indication?

20. What are the main classes of agencies now engaged in supplying farm mortgage credit to farmers?

21. Explain the need for standardizing farm mortgages as a basis for obtaining credit.

22. What is amortization?

23. Describe the Federal Farm Loan System.

SPECIAL PROBLEMS

1. Write a brief essay describing the principal provisions of the Federal Reserve System.

2. What was the total estimated farm mortgage indebtedness in the United States in 1920, and what proportion was supplied by each of the principal sources of farm mortgage loans?

3. How may standard warehouses and warehouse receipts be made a means of improving farm credit?

4. Describe the crop lien system of the South.

5. How can the country banks be made to meet more adequately the needs of farmers for credit?

6. Write an essay describing the new agricultural credit legislation passed by Congress in 1923.

7. Discuss the need for a system of credit to aid the landless man of small capital to acquire a farm, and the possibilities of a system of second mortgage credit adapted to this purpose.

8. Describe the Crédit Agricole of France.

9. Classify the various states of the United States according to the average rate of interest on farm mortgage loans, and explain the variations of the rates for each group from the average rate for the entire United States.

10. Let the members of the class organize themselves into a coöperative credit association according to the provisions of the Farm Loan System, and let each member take the various steps that would be necessary to obtain a loan through his local association.

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CHAPTER XVIII

AGRICULTURAL POPULATION AND FARM LABOR

I. Agricultural population
   1. Changes in rural population
   2. What proportion of city increase is at the expense of the open country — that is, consists of migration from country to city
   3. Significance of the movement of population from country to city
   4. The agricultural population of the United States

II. The supply of farm labor

III. Hired farm labor
   1. Kinds of hired laborers
   2. Supply of hired farm laborers
   3. Demand for hired farm laborers
   4. Adjustment of demand and supply of farm labor

IV. Wages of farm labor
   1. Various methods of paying wages
   2. Variation in wages according to efficiency
   3. The wage day and labor day
   4. Variations from the general level of farm wages
   5. Conditions determining the general level of wages for all classes of laborers
   6. Conditions which influence the return to labor engaged in agriculture as distinguished from the return to all classes of labor

V. Farm labor organizations

I. Agricultural population. — 1. *Changes in rural population.* — In every decade since 1790, rural population as defined

in the Census[1] has increased, but the percentage of rural population to total population has declined, except from 1810 to 1820, while the per cent of urban population has increased. The following table summarizes these changes from 1790 to 1920.

TABLE 17. DECENNIAL CHANGES IN URBAN AND RURAL POPULATION, 1790–1920, INCORPORATED PLACES OF 8,000 OR MORE BEING CLASSED AS URBAN

Decade Ending	Percentage of Increase in Total Population	Percentage of Population in Incorporated Places of 8,000 or More to Total	Per Cent Living Outside of Incorporated Towns and Villages of 8,000 or More[1]	Per Cent Living in Towns and Villages of 2,500 or More	Per Cent Living Outside of Towns and Villages of 2,500 or More
1790	——	3.3	96.7	——	——
1800	35.1	4.0	96.0	——	——
1810	36.4	4.9	95.1	——	——
1820	33.1	4.9	95.1	——	——
1830	33.5	6.7	93.3	——	——
1840	32.7	8.5	91.5	——	——
1850	35.9	12.5	87.5	——	——
1860	35.6	16.1	83.9	——	——
1870	26.6	20.9	79.1	——	——
1880	26.0	22.7	77.3	29.5	71.5
1890	25.5	29.0	71.0	35.4	64.6
1900	20.7	32.9	67.1	40.0	60.0
1910	21.0	38.7	61.3	45.8	54.2
1920	14.9	43.8	56.2	51.4	48.6

[1] In this column rural population includes persons living in incorporated towns and villages under 8,000 population.

The fact that the proportion of rural population (as defined by the Census) to total population has steadily declined has been generally interpreted to mean that the population connected with the farms has declined relatively to total population.

[1] Before 1880 incorporated towns and villages of 8,000 or more were classed as urban. Beginning with the Census of 1880 all incorporated towns and villages of 2,500 or more are classed as urban.

However, this conclusion by no means follows, for rural population includes a number of classes besides persons dependent on farming for a living. For instance, there are the persons living in incorporated villages under 8,000 (or under 2,500), the persons living in unincorporated towns and villages, and the people of other occupations living in the open country not engaged in farming. On the other hand, in many incorporated towns and villages are persons who operate farms and who are dependent on farming for a living.

There is some statistical evidence to show that the proportion of population dependent on farming for a living has not decreased so steadily as has been generally assumed. Dr. W. I. King [1] has calculated the farm population by multiplying the number of farms by the average size of farm family and has computed separately the percentage of population living in incorporated places. The estimate shows that there was little change from 1850 to 1900 in the percentage of population connected with farms to total population. Somewhat confirming Dr. King's conclusions are the occupation statistics, which show that from 1850 to 1900 the proportion of total population gainfully employed in agriculture to total population did not decline.[2]

How can this fact be consistent with the undoubted fact that the percentage of rural population decreased each decade? In the first place, as shown by Dr. King, the percentage of population in incorporated places under 8,000 to total population was declining steadily. Moreover, we must consider the fact that one hundred years ago there were large numbers of persons living in the country but engaged in occupations other

[1] King, Willford I., *The Wealth and Income of the People of the United States*, p. 16.

[2] Derived by calculation from a table published in "Land Tenure in the United States with Special Reference to Illinois," by Charles Leslie Stewart, University of Illinois *Studies in the Social Sciences*, Vol. V, No. 3.

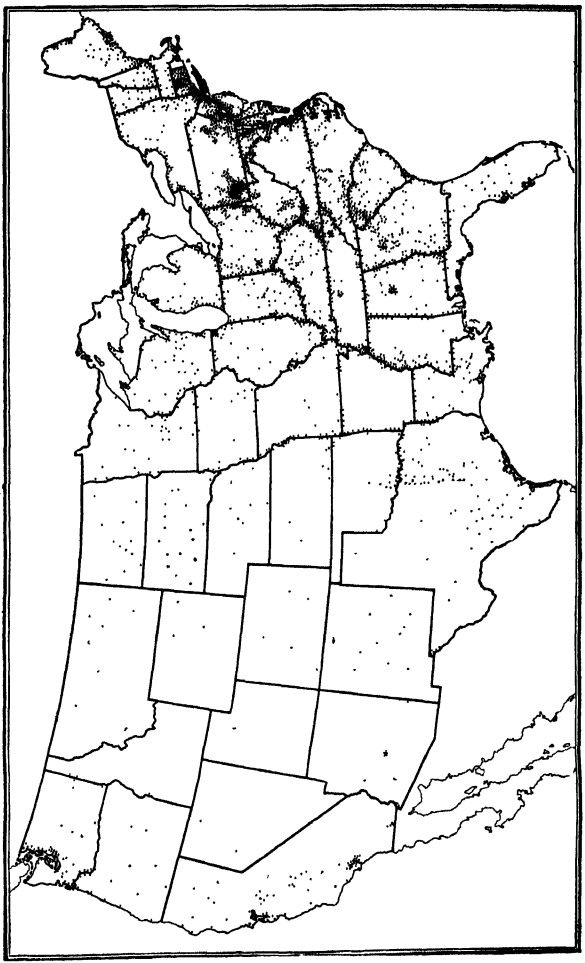
than agriculture. Lawyers, doctors, storekeepers, tanners, carpenters, shoemakers, blacksmiths, and members of many other occupations who formerly lived in the open country or in small villages have moved into cities. Similarly, there has been a tendency for farmers to move to towns and cities while still operating farms.

However, whatever may have been true from 1850 to 1900, there can be little doubt about the tendencies from 1900 to 1920. The population outside of incorporated cities and towns of 2,500 or more increased only 9.1 per cent from 1900 to 1910 and 3.2 per cent from 1910 to 1920.[1] If we subtract from rural population the people living in incorporated towns and villages of 2,500 or more, it appears that the remaining rural population increased only 5.9 per cent from 1900 to 1910 and 1.9 per cent from 1910 to 1920. The population gainfully employed in agriculture apparently declined 13.8 per cent from 1910 to 1920, but this result is attributable largely to a change in the time of year in taking the census.

2. *What proportion of city increase is at the expense of the open country — that is, consists of migration from country to city?* — The so-called "cityward movement," which has caused so much alarm in this country, is by no means our peculiar problem. It has prevailed during the past century or more in practically all the civilized nations of the world. For instance, in England the rural population declined from 49.8 per cent of the total population in 1851 to 21.9 per cent in 1911.

The alarm occasioned by the tendency has largely been due to a misapprehension of the nature of the movement. One of the most common mistakes is the assumption that all the increase in city population comes from the country. The results of an analysis of the sources of urban increase in the

[1] The increase from 1910 to 1920 is 5.4 per cent if comparison is made on the basis of territory which was rural in 1920.



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FIG. 62. — POPULATION OUTSIDE INCORPORATED PLACES, 1920. (One dot for each 4000 people)
Statistics of population outside incorporated places, although including many mill workers, miners, and lumber workers, affords the closest approximation as to the local distribution of farm population.

United States for the decade 1900 to 1910 are summarized as follows: [1]

TABLE 18. SOURCES OF URBAN INCREASES IN UNITED STATES, 1900–1910

	Increase	Per Cent of Total Increase
Total urban increase as shown by Census =	11,826,000	——
Accounted for by immigration from foreign countries =	4,866,000	41.1
Natural increase (excess of births over deaths) =	2,509,000	21.2
Incorporation of rural territory into urban territory =	924,000	7.9
Balance attributable to migration from rural districts =	3,527,000	29.8

It appears that over seventy per cent of the total increase in city population was due either to immigration, to natural increase, or to incorporation of rural territory — either by the addition of suburban areas to incorporated cities or by towns under 2,500 growing into places larger than 2,500 during the decade. Only 29.8 per cent of the total increase, or 3,527,000, is the probable actual migration to the city from rural districts. However, some of this migration was from towns and cities under 2,500 population. If we assume that the migration from the open country was in proportion to the ratio of the population in open country to total rural population — 83.5 per cent in 1910 — it appears that the total migration during the dec-

[1] Derived from article "Measure of Rural Migration and Other Factors of Urban Increase in the United States," *Quarterly Reports* of American Statistical Association, September, 1915, pp. 642–653, and Merritt, E., "The Agricultural Element in the Population," *Quarterly Report* of American Statistical Association, March, 1916.

ade from the open country to cities was 2,945,045, or 24.7 per cent of the total increase in urban population.

Since it is estimated that the natural increase (excess of births over deaths) was 16.96 per cent for rural territory as compared with 8.8 for cities, it is clear that the excess per cent of natural increase for the open country was 8.16. On this basis, assuming the country to maintain the same natural rate of increase as the cities, the country would have had a surplus over this natural rate of increase amounting to 3,178,238, while the estimated migration from the open country to cities during the decade was only 2,945,045.

3. *Significance of the movement of population from country to city.* — Frequently it has been assumed that the tendency toward migration of rural population to cities is due to discontent with the conditions of living in the country, such as long hours of labor, lack of home conveniences and of a satisfactory social life, and poor educational advantages. Too often writers on the subject are inclined to contrast the worst conditions of country life with modes of living in cities above the average, forgetting the millions who live in crowded slums under conditions of extreme poverty and squalor.

However, even if country living had been very much more attractive than it is, the movement to the city would still have taken place, for it is due to economic changes that have made such a movement inevitable. At the foundation of the whole movement is the fact that because of the greatly increased efficiency of agricultural production a much smaller number of farm workers is required to supply the wants of a given population than was the case, say, fifty years ago. For instance, in 1770 forty-two per cent of the population of England was engaged in producing the agricultural products consumed by that nation, while in 1841 only twenty-one per cent of the population was engaged in agricultural production. In both years the agricultural imports were small, and there was probably

little change during the fifty year period in quantity of agricultural products consumed by a given number of people.[1]

Now, if forty per cent of the population is sufficient to supply the wants for agricultural products which it took eighty per cent of the population formerly to supply, it would clearly be a waste for the other forty per cent to continue to engage in farm production.

It may be said that the conclusion does not apply because not all the wants for farm products are satisfied, for some people do not have enough to eat. This is true, but neither are all wants satisfied in other directions. If some individuals have not enough to eat, it is because in the distribution of wealth and income they have not received a share large enough to enable them to buy what they need or would like to have. Even these persons are probably not buying all the farm products they could buy, because they are using part of their income to buy other things. To buy more farm products would compel them to buy less of other things they want more. Moreover, it is probable that all but the very poor already satisfy their wants for raw farm products rather completely before they buy other things. Hence, they would not buy much more farm products even if the price of such products were considerably lowered. Another way of putting it is to say that the smaller the proportion of population required to produce agricultural products the larger the proportion available for producing other things. Countries like India and China, because they are overcrowded, necessitating wasteful methods of using labor, can spare only a small proportion of their population for purposes other than agriculture.

A good illustration of how increased efficiency releases population from farming is shown by the decline in population of the best portion of the Corn Belt from 1900 to 1910, attrib-

[1] Other illustrations of the increased efficiency of labor in agriculture have been given elsewhere, Chapter XI.

uted to the use of larger teams which makes it possible for each laborer to operate a greater acreage. This decrease in population did not mean a decline in agriculture but on the contrary was accompanied by a rise in price of land, an increase in number of dairy cows, and in production of corn, oats, hay, milk, and butter.

Another great economic change responsible for the relatively rapid growth of cities is the development of production in city factories of nonagricultural goods formerly produced in the country. A hundred years ago farmers or other residents of the open country or villages produced for themselves many things now produced in cities, such as harness, farm implements, and clothing.

It is clear, then, that the relatively rapid increase in city population has been a natural result of economic progress and also has been favorable to that progress. Likewise, it has benefited farmers, for otherwise the supply of farm products would be much larger; consequently, the wages of farm labor would be much lower, while the values of manufactured goods bought by farmers would be higher.

But what of the theory that people leave the country because they do not like the conditions of country life? In the first place, it has been shown that people have moved out most rapidly from the very regions where social conditions of life are most desirable.[1] Many have undoubtedly moved to cities, believing themselves dissatisfied with conditions of country living, who if they had remained would have increased the tendency to overproduction and consequently smaller returns to farm labor and capital.

4. *The agricultural population of the United States.* — While the rural population of the United States was 51,406,017 in 1920, only 42,434,468 lived outside of incorporated places.

In 1920, 65.9 per cent of the rural population of the United

[1] Hoagland, H. E., *Journal of Political Economy*, Vol. XX, pp. 913–927.

States was composed of native whites of native parents; 8.5 per cent of native whites of foreign parents; 6.5 per cent of foreign born whites; and 5 per cent of mixed parentage.

A smaller proportion of our present-day immigrants seek the farm than was the case of the older immigration, for the following reasons:

a. There is now comparatively little good free land available.

b. Farming requires more capital than was necessary thirty years ago.

c. The returns for labor in farming probably have not been so attractive, especially during the period of the recent war, as in manufacturing and other city occupations.

d. The new immigrants largely come to work for wages, expecting soon to return to their native land.

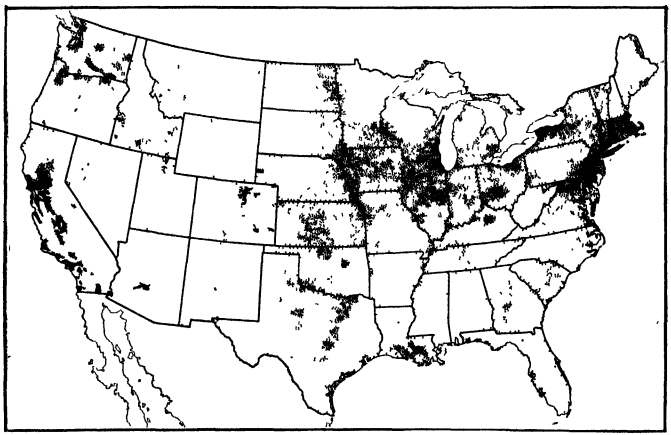
e. Immigrants land in cities and seek the first available job. Likewise, in the cities they find their kinsmen and members of their own races and in the foreign quarters can speak their own languages, attend their own churches, and enjoy the methods of living to which they are accustomed.

Many people believe that special measures should be taken to attract foreigners to agriculture. It is doubtful, however, whether such an effort would overcome to a large extent the forces attracting immigrants to cities. It is also doubtful whether, since we already have a normal overflow from country to city, we should attempt to divert a large stream of immigrants to the country, still further displacing our native farm population.

II. The supply of farm labor. — The farming industry is peculiar in that the work is done not largely by a class of hired laborers but by the proprietor of the business and his family. According to the Census of Occupations (1920), there were 10,647,438 persons engaged in farming.[1] Of these 6,448,343

[1] Since the Census of 1910 showed more than 12,000,000 persons engaged in farming there was apparently a large decrease from 1910 to 1920. How-

were classed as farm operators. However, more than a half million of the farm operators were negro croppers in the South, who in many respects resemble farm laborers (see page 266). Of the so-called farmers (operators of farms) 261,719 were



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FIG. 63. — EXPENDITURE FOR FARM LABOR IN 1919, INCLUDING VALUE OF BOARD AND LODGING. (Each dot represents $100,000)

The expenditure for labor in 1919 was greatest in the trucking, fruit, and dairying areas. Heavy expenditure is also shown in most of the Corn Belt and somewhat less in the winter and spring wheat areas. Although cotton is a crop requiring much more labor than any other major crop, the cash expenditure is small in the Cotton Belt, because most of the labor is furnished by croppers and tenants. In the black prairie of Texas, however, many Mexicans are hired to pick cotton.

females. There were 4,041,627 farm laborers, of whom 792,915 were females. A large majority of these were negro women and girls in the South employed in chopping and picking cotton and other occasional employments.

ever, a large part of the apparent decrease was due to the fact that the Census of 1920 was taken as of January 1, while the Census of 1910 was of April 15.

Statistics of the number of persons doing farm work for wages are likely to exaggerate the relative importance of this class of work in farming because of the fact that each person who works only a few days per year for wages is counted as a farm laborer.

The fact is that a large proportion (45.8 per cent) of the total number of persons classed as *gainfully employed agricultural laborers* (1920) were employed on the home farm, and of women laborers 72.7 per cent were employed on the home farm.

III. Hired farm labor. — 1. *Kinds of hired laborers.* — It is not strictly correct to speak of the hired-labor class, for hired farm laborers are made up of a number of very different classes. We may classify hired laborers from the standpoint of period of employment, as follows:

a. Hired by year on salary — mainly foremen and other minor officers on large farms

b. By month for year-round work

c. By month in season

d. By day in season

e. By day for odd jobs.

It is also important to classify farm laborers from the standpoint of the motives and conditions which cause them to hire out as farm laborers. From this standpoint we may recognize the following groups:

a. Farmer boys working temporarily a few days at a time for neighbors

b. Farmer boys working for parents

c. Farmer boys gaining experience and saving money to buy farms or to become tenants

d. City boys working for experience with intention of becoming farmers

e. Young men working to gain experience and for money but not expecting to farm

f. Winter workers from lumber camps and other winter industries

g. Miners, factory workers, and others filling in temporarily during unemployment

h. Hoboes who do occasional work as they wander about

i. Derelicts and drifters working a few months, then moving on

j. Farm hands who have no other outlook but expect to continue in this class

k. Wives of farmers and their children working for wages, usually in rush seasons.

Those who remain permanently as farm laborers in proportion to total population are much less numerous in this country than in England where there is a large permanent class with no other opportunity. However, one or two local studies have shown that hired laborers in the United States succeed in becoming tenants at older ages than was the case a few years ago.

2. *Supply of hired farm laborers.* — Many people are continually talking about the increasing scarcity of farm labor. From some points of view there is truth in the claim. Apparently from 1880–1920 there was a marked decrease in the average number of hired laborers per hundred acres of land in crops.

Consequently, farmers as a class have ground for their chronic complaint about the insufficient supply of farm labor. However, this complaint is also largely to be explained by considering some of the things farmers and others have in mind when they speak of the scarcity of farm labor. They are likely to mean one or more of the following things:

a. Employers cannot get men just when wanted.

b. Employers cannot get men of the quality desired.

c. Employers cannot get enough men at wages they are willing to pay.

d. There may be a temporary or permanent scarcity in certain localities though there may be a fairly abundant supply in the country as a whole.

e. There are periods when the supply for the country as a whole is reduced by temporary movement of farm labor to cities. For instance, the recent war greatly increased the scarcity of farm labor, but after the war it began flowing back to the farms. Thus in 1918 the index of farm labor supply was only 71.9 per cent of normal; in 1919 it was 82.9; in 1920, 68.8; in 1921, 108.8.[1]

The above fluctuations in part represent changes in demand, as well as in supply.

3. *Demand for hired farm laborers.* — In part, the extent of the demand for farm laborers is dependent upon varied conditions which determine the volume of demand for agricultural products; in part, on the system of farming as determining seasonal variations in need for labor; and in part, on how much of the farm work is done by farmers and their families. This last is a matter of size of farms and the extent to which the farm is small enough so that the farm family can do all or most of the work.

Even if the members of the farm family do most of the farm work, they will need extra help in rush seasons. The seasonal variation in need for labor depends largely on the kind of farming. Practically all kinds of farming involve more work in some periods of the year than in others. (See page 130.) In general, so-called one-crop systems of farming have greatest seasonal fluctuations.

4. *Adjustment of demand and supply of farm labor.* — The problem of adjusting demand and supply of labor in farming is largely a result of these seasonal variations in the need for labor in farm operations. If it were not for this seasonal variation in demand the problem would be simpler in agriculture than in manufacturing, for the variations from year to year in demand for labor in agriculture are probably much less than in

[1] *Monthly Crop Reporter*, April, 1921. These figures, of course, are relative, not absolute.

ndustry. The various ways of adjusting supply of labor with demand for labor may be summarized as follows:

a. Adjustments on the farm.

(1) By employing the regular workers on the farm a larger number of hours per day in rush seasons

(2) By employing woman and child labor to supplement the regular labor of the farm

(3) By postponing some of the regular tasks until the season of heavy demand for labor has passed

(4) By readjusting the plan of farming so as to make the labor demand more uniform throughout the year. (See page 130.)

b. Temporary employment of labor already in the community. — The labor supply may be enlarged from within the community in the following ways:

(1) Neighbors may exchange labor.

(2) City and town laborers may go out to work temporarily in the country — for instance, for cotton picking, harvesting grain, etc.

c. Employment of labor from outside the community. — The necessity for bringing laborers in large numbers from outside the community to supply the large seasonal demand for labor is usually greatest in regions where the system of farming consists mainly in the production of small grain. It is estimated that the percentage of the grain harvest work performed by laborers from outside the county is 17.3 in the United States as a whole. In North Dakota it is forty-one per cent; in South Dakota twenty-seven; and in Kansas thirty-one. However, in states with diversified farming, having a considerable village and small town population, such as Illinois and Iowa, the percentage is small. The percentage is also small in the South, due to the employment of women and children in seasons of increased demand.[1]

d. Labor exchanges. — In the regions where wheat is the

[1] Statistics from *Monthly Crop Reporter* for April, 1921.

principal crop, it is necessary at harvest time to import a large number of laborers from outside the county. Many of these laborers come hundreds and sometimes thousands of miles to work in the harvest fields. Under these conditions there is great danger of under supply or over supply either in the region as a whole or locally. Even though the labor army is sufficiently large in the entire region, the irregularity in the ripening of the crops or improper methods of distributing labor may result in an excess in one county and a deficit in another. This necessitates the development of special arrangements to distribute migratory labor. This problem has been most satisfactorily solved in the Canadian grain provinces where the government, in coöperation with the railroads, has provided a system of ascertaining the amount of labor needed in various districts and the time when it is needed and of transporting laborers from eastern Canada at low rates on the railways.

It cannot be said that a satisfactory solution has yet been developed in the United States. During the recent war the Federal Government made special efforts to distribute labor more effectively, but the arrangements were afterward discontinued. An employment service is maintained by the Department of Labor, but it only partly satisfies the need.

The success of any system of labor exchanges depends partly on farmers. Farmers should make their requests for labor several weeks in advance; they should give full information about the jobs, the wages to be paid, the conditions of labor, etc.; and they should usually be willing to advance car fare, having the laborers' baggage checked to the employer as a guarantee of repayment. It is also important that the farmers report to the employment office after the men arrive and that they report those who quit and prove unsatisfactory. If the farmer asks for a man and then changes his mind or hires elsewhere, the employment office should be informed.

IV. Wages of farm labor. — 1. *Various methods of paying*

wages. — There are many different kinds of wage contracts in the employment of farm labor. Some of the most important kinds are as follows:

a. Differences in the time basis of the wage contract. — It is customary to express the wage rate in terms of so much per month, per year, per day, or per hour.

b. Duration of contract. — There are also differences in the length of time for which the laborer is employed. To some extent this corresponds to the time basis of payment but not entirely; for instance, sometimes hands are paid by the month but with the understanding that they will have the job for a year or even longer.

c. Forms of payment. — There are also variations in form of payment. In addition to money wages various perquisites are frequently included. Unmarried laborers often receive board in addition to wages. Married laborers may be given use of house, fire-wood, ground for garden, pasturage for cow and other stock, milk, eggs, fruit, and other products. Generally these privileges are roughly valued in terms of money, and a lower money wage is paid in consequence. Sometimes, however, the perquisites are given in addition to the regular wage rate as a means of retaining an especially good laborer and keeping him satisfied. Many of these extras cost the farmer little but mean a great deal to the laborer.

In addition to paying wages on the basis of time employed, it is also frequently the practice to pay by the piece or job — as, for instance, in hiring a man to dig post holes at so much per post. The system of hiring by the job is likely to be desirable when the quality of the work is not important and when the employer cannot be present to see that the laborers work steadily.

Some farmers pay bonuses to employees to stimulate them to perform an unusually large amount of work or work of unusually good quality. Sometimes laborers are also promised

shares of profits in the farm in order to make them feel an interest in the business. It is feasible only where the laborers are fairly permanent on the farm and where a system of farm accounting is employed in which both parties have confidence. In periods when there is great uncertainty as to prices of farm products, it may be desirable to embody in the labor contract an agreement for a sliding scale of wages so that the wages will vary up or down according to changes in the prices of products.

2. *Variation in wages according to efficiency.* — To a certain extent the wages of farm laborers vary according to the efficiency of the individual laborer. Thus boys are paid less than full-grown men, and old men are paid less than young men. In piece work, of course, there is a fairly close correspondence between the quantity of the work done and the wages paid. In general, however, it is believed that farm wages do not vary closely in accordance with differences in the quantity or quality of the work of individuals. There is a tendency to pay a flat rate, and the effect of this practice is to discourage the individual from exerting himself to increase his efficiency.

3. *The wage day and the labor day.* — It is impossible to have a standard working day in the country. At times of emergency it is necessary to work all day and part of the night, and at other times the working day may be shortened. Farmers tend to exaggerate the length of the working day in comparing it with the working day of the city laborer by including the time going to and from work and perhaps even the time devoted to meals.

The average number of hours of work on ten general farms and twelve dairy farms in Wisconsin is shown in the following table:[1]

[1] Data gathered by O. A. Juve and published in "Farm Labor in Wisconsin," by H. C. Taylor and John D. Black, *Bulletin 316*, Wisconsin Experiment Station, p. 32.

TABLE 19. AVERAGE WEEKLY AND SUNDAY HOURS OF WORK FOR HIRED MEN AND PROPRIETORS ON TEN GENERAL FARMS AND TWELVE DAIRY FARMS IN WISCONSIN

Months and Seasons	Average Week-day Hours		Average Sunday Hours	
	Hired Men	Proprietors	Hired Men	Proprietors
Crop Season	*Hours*	*Hours*	*Hours*	*Hours*
April	11.8	10.9	5.5	5.4
May	12.0	11.4	5.8	5.3
June	11.7	11.3	4.7	4.8
July	11.6	10.9	4.3	4.1
August	12.0	11.2	4.7	3.9
September	11.6	10.9	4.6	4.6
October	12.1	11.1	4.6	4.6
Average for season	11.8	11.1	4.7	4.7
Winter Season				
November	11.3	10.4	5.7	4.6
December	11.1	10.4	5.5	5.3
January	11.5	10.2	5.5	5.9
February	11.1	9.5	5.2	5.5
March	11.0	9.1	4.6	5.6
Average for season	11.1	10.1	5.3	5.4
Average for year	11.52	10.68	4.91	4.98

Provided the length of the working day is not excessive the farm laborer should be most concerned with the wage day rather than with the maximum length of the working day.

4. *Variations from the general level of farm wages.* — The general average or level of wages varies in different countries and even in different sections of the same country. These differences for various sections of the United States are shown in the table on page 372.

How shall we explain these differences? Why, for instance, were wages of male labor without board only $35.75 per month in the South Atlantic States, while in the same year the average

was $51.92 in the North Atlantic States; $59.63 in the North Central States west of the Mississippi River, etc.?

TABLE 20. WAGES OF MALE FARM LABOR IN 1920[1]

State	Per Month		Per Day at Harvest		Per Day Other than Harvest	
	With Board	Without Board	With Board	Without Board	With Board	Without Board
	1920	1920	1920	1920	1920	1920
North Atlantic	51.92	75.54	3.78	4.68	3.20	4.01
South Atlantic	35.75	50.56	2.69	3.30	2.13	2.74
North Central east of Mississippi River	51.49	70.09	4.17	5.00	3.22	4.01
North Central west of Mississippi River	59.63	79.79	5.03	5.94	3.78	4.67
South Central	36.53	51.94	2.80	3.41	2.29	2.89
Far Western	73.21	99.43	4.48	5.39	3.66	4.61

[1] Statistics taken from *Monthly Crop Reporter*, December, 1920, p. 147.

5. *Conditions determining the general level of wages for all classes of laborers.* — Since the return to farm laborers in part is dependent on the return to other classes of labor, because of a more or less free movement of the supply of workers between city work and farm work, it is important to consider the general conditions that influence the return to all labor. These conditions are briefly as follows:

a. The return to labor, as well as the return to capital and to land, is dependent, other things being equal, on the general efficiency of national industry. In a country where the total national income is low because of crude and inefficient methods of production — as, for instance, in central Africa — the return to labor could not be so high as in the United States.

b. Another important condition which determines the general return to labor is the ratio of the supply of labor to natural

resources, and especially to agricultural land. In a very crowded country the average return to labor in agriculture is lowered because of the influence of the law of diminishing productivity (see page 142), for, as a country becomes exceedingly crowded, the average product per unit of labor employed in farming and other extractive industries is likely to decline, and consequently the average wage of agricultural labor, as well as of other classes of labor, necessarily will decline. This is one reason why a country so crowded as China is characterized by very low wage rates as compared with the United States, although another reason is that production is less efficient in China than in the United States.

To some extent the small return to labor in production of agricultural products due to overcrowding and the operation of the law of diminishing returns can be alleviated by foreign trade. For instance, if England should attempt to produce all of its food products, it is probable that the average return to labor in England would be smaller than it is.

c. Since the ratio of population to land exerts an important influence on wages, the laws governing the increase of population have a close relation to wages. If wages are higher in one country than in another, this condition is likely to result in immigration from the second country to the first. Moreover, there is a relation between the ratio of population to land and the birth rate. In a sparsely settled country where land is abundant the birth rate is likely to be high, whereas in a densely settled country the birth rate may be lower. The connection between birth rate and ratio of population to land is through the standard of living. If the people of a country have a high standard of living, they may refrain from multiplying so rapidly that they cannot maintain this standard of living. Otherwise the increase in population may be finally checked by pestilence, war, and famine.

The standard of living influences wages in another way.

Within certain limits the higher the standard of living the greater the efficiency of the laborer, for a high standard of living is likely to result in improved health, strength, and intelligence.

d. Special privileges, such as monopoly, etc. enjoyed by other classes of the population, may reduce the wages of labor. On the other hand, special advantages enjoyed by laborers through organization or favorable legislation may within certain limits increase wages at the expense of the return to other classes.

6. *Conditions which influence the return to labor engaged in agriculture as distinguished from the return to all classes of labor.* — If labor moved without restriction from one industry to another and from one section of a country to another section, there would probably be little difference in the long run between the return to labor employed in agriculture and the return to labor of similar skill engaged in other classes of work. However, for various reasons labor does not move freely from one industry to another or from one section to another. Consequently, we shall need to consider some of the special conditions that affect the return to labor in farming.

We have already noted that agriculture is peculiar in the fact that much of the work of this industry is performed not by hired labor but by the employers themselves, who therefore do not receive their return as a wage but as what is left after expenses of production are paid. Thus if the total receipts of a given farm are $2,000, we may consider that a certain part of this represents the return for the use of land; another part covers interest, depreciation, and risk of capital; another part goes to pay for the expenses incurred for materials of various kinds; and still another part must cover the wages to pay hired laborers. After all these deductions have been made from the total product, we may consider the remainder as pay for the labor which the farmer himself has devoted to the business. Theoretically, this return should be large enough to equal not

only the value of the same amount of labor if hired but also an additional amount to cover the time and skill which the farmer has devoted to managing the business. In reality, such statistics as we have tend to show that the average return for the labor of the farmer employer does not differ greatly from the average wage paid for hired farm labor. Of course, some employers by reason of special efficiency as managers make a very much larger return than hired laborers, but other farmers make even less for the use of their time after paying all other expenses than they would have had if they had worked for wages.

This general relation between the wages of farm laborers and the wages of farmers themselves is due to the fact that in the United States it is fairly easy for a laborer to become a farmer, for in some sections of the country almost any efficient laborer can rent land and become a farmer. Consequently, if the return from farming is comparatively large there will be a large increase in the number of farmers from the ranks of laborers. On the other hand, if the return from farming is smaller a larger number of farmers will quit farming and become hired laborers.

In considering the following conditions affecting the return for labor in agriculture, we shall have in mind not only the return to wage laborers but also the return for the labor of farmers.

a. The wages of farm laborers are likely to be influenced by changes in the prices of farm products. Let us suppose prices of farm products increase suddenly, as they did from July, 1916 to July, 1917. Since some wage contracts are made for the year and since the element of custom has considerable influence on rates of agricultural wages, the result is that wages do not rise as quickly as do prices. Since labor is a large item of expense, the profits of employing farmers will increase suddenly. On the other hand, hired laborers will find that they are temporarily worse off because their wages have not risen so rapidly as have the prices of things which they have to buy.

When a sudden fall of the prices of farm products occurs, the opposite may be the case. Wages do not decline so rapidly as do the prices of products, and wage earners therefore find themselves relatively better off, provided they can still find employment.

b. A general increase in the value of farm products, especially if it occurs slowly, may result in an increase in the value of land rather than in an increase in the value of labor.

c. The increased efficiency of farm labor is likely to result in higher wages. Farm workers are likely to get part of the increased product due to their increased efficiency and to share part of this increased product with other classes in the form of lower prices of products. In like manner farm laborers benefit from the increased efficiency of other classes of labor through the lowered value of the things which farm laborers buy.

d. It has already been pointed out that the standard of living of the laboring class exerts a considerable influence on wages. Consequently, the more farm laborers develop a high standard of living and the more readily they change their employment to other industries when they find that thereby they can enlarge their income, the more effectively will the level of farm wages be adjusted to the level of wages in other industries.

V. Farm labor organizations. — Proposals have frequently been made to organize farm labor into unions after the fashion of labor unions in other industries. Although farm labor unions have been developed in France, England, and some other European countries, there are special difficulties in the way of organizing farm laborers in the United States. These difficulties may be summarized as follows:

1. Usually the number of laborers employed on a single farm is small — an average of about one and one half for the country as a whole. On the other hand, the number of employers to be dealt with in the country as a whole is very great, and therefore collective bargaining is difficult.

2. Conditions of production vary on nearly every farm. It is, therefore, difficult to standardize these conditions and to effect standard agreements.

3. The agricultural laborer occupies a position much less strategic than that of the industrial laborer because so large a part of farm work is done by the employer, and it is comparatively easy for the employer to do without the hired labor, if necessary, by doing part of the work himself, by having his family do part of it, or by substituting the use of machinery.

4. There is no such well marked class difference between employer and employee as prevails in manufacturing industries. A large number of farm laborers hope to become farm operators, either as tenants or as owners. Recent studies have shown that more than half the farmers who own their farms have been at one time hired laborers, while a large proportion of tenants have at one time been hired laborers. Moreover, a large number of farm laborers are the sons of farmers or are otherwise related to employing farmers.

In fact, in America the real issues are not so much between the wage worker and the employer on the farm as between all agricultural workers and persons engaged in other lines of industry, for, after all, the wages both of farmers and of hired laborers are limited by farm earnings, and farm earnings are limited by the prices of farm products.

In England, as a result of war legislation and postwar legislation, standard agreements as to farm wages are determined through the intervention of a Board of Conciliation.

QUESTIONS ON THE TEXT

1. What change occurred from 1790 to 1900 in the proportion of population living in rural territory to total population? From 1900 to 1920? What proportion of the total population resided on farms in 1900 and 1920?

2. How do you account for the difference in tendency with reference to rural population and population on farms from 1790 to 1900?

3. Approximately what proportion of the total increase of city popula-

tion is from rural territory? From the open country? What are the other sources of urban increase?

4. Would the movement of population from the country to cities have occurred even if the conditions of living in the country had been much better than they are?

5. What economic conditions have made necessary the movement from country to city?

6. Is the fact that not all of our wants for farm products have been satisfied proof that the movement was not economically justifiable?

7. What proportions of our white rural population in 1920 were native born, foreign born, and native born of foreign parentage?

8. Why do a smaller percentage of immigrants go to the farms than was the case thirty years ago?

9. What proportion of the farm workers of the United States are employed as hired farm laborers?

10. What proportion of male hired farm laborers are employed on the home farm? Of female hired laborers?

11. What are the principal groups of hired farm laborers, classified from the standpoint of the period of employment? From the standpoint of the motives and aims of the laborers?

12. Was the number of farm laborers per 100 farms larger or smaller in 1910 than in the two previous decennial years?

13. How do you explain the persistent complaints about scarcity of farm labor?

14. What conditions are responsible for the fluctuation in the demand for farm laborers?

15. What are the three principal methods of adjusting the demand for and the supply of farm labor?

16. What are the principal methods of adjustment on the individual farm? Within the community?

17. Discuss the problem of providing for temporary increases in the supply of laborers brought in from outside the community. In what sections is this problem most important?

18. What are the various methods of paying farm laborers? Discuss the advantages and disadvantages of each method.

19. To what extent do farm wages vary in accordance with the efficiency of the laborers?

20. How do the daily hours of labor of farm workers compare with those of city laborers?

21. What was the average monthly wage of farm laborers in 1920 in each of the six principal sections of the United States?

22. What are the conditions that may cause the return to all classes of labor to be higher in one country than in another country?

23. What are the conditions that determine how high the wages of farm laborers will be in proportion to the wages of other classes of laborers in the same country?

24. In what sense is it true that conditions that make for a high return for the labor of farmer employers will also result in a high return for the labor of their employees?

25. Why are organizations of farm laborers less likely to be successful than organizations of city laborers?

SPECIAL PROBLEMS

1. What proportion of the foreign-born rural population of the United States is from each foreign country? In what parts of the United States is each class of foreign-born rural population? (See volume on "Rural Population," *Atlas of American Agriculture* published by United States Department of Agriculture.)

2. Compare the proportion of rural to total population in the various important nations of the world. (See table in *Yearbook* for 1920, United States Department of Agriculture.)

3. Write a brief essay on how an employing farmer in your community should deal with his laborers to make them efficient.

4. Write a brief essay on how to select farm laborers.

5. Describe the Canadian system of securing extra laborers for the wheat fields of central Canada.

6. Why are wages in China so much lower than in the United States? Why are they lower in the South than in the North?

7. Make a list of the farm laborers of your community and group them according to the classification on page 364.

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CHAPTER XIX

MARKETING PROCESSES — COTTON

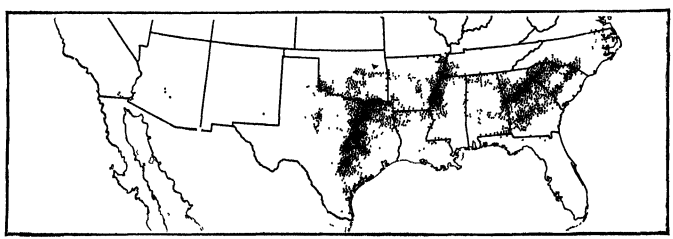
I. General character of the task of marketing the cotton of the United States
II. Commercial classes and grades
III. Ginning
IV. Baling and tare
V. Local storage of cotton
VI. The local marketing of cotton
    1. Local marketing agencies
    2. Local prices
    3. Need for local coöperation in the marketing of cotton
VII. Stages in the marketing of cotton beyond the local market
VIII. Costs of marketing cotton

In studying the marketing of farm products it is desirable first to describe the processes of marketing for a number of typical products — cotton, milk, butter, eggs, vegetables, and fruits. The concrete picture thus afforded will place us in a better position to consider the general aspects and problems of marketing as presented in Chapters XXII and XXIII.

I. General character of the task of marketing the cotton of the United States. — Since cotton is not used on the farms where it is produced, practically the entire product of the United States, which has varied in recent years from about 10,000,000 to about 16,000,000 bales a year, has to find its way to market. Until the outbreak of the European war about two thirds of our cotton crop was annually exported. Since then exports have been about one half of the total. Of the re-

mainder over one half is consumed in Southern factories, and the rest is sent to Northern mills.

II. Commercial classes and grades. — The two principal types of American cotton are sea-island cotton and upland cotton. The former, characterized by a fine, strong, silky fiber of one and one-half inches or more in length, is produced mainly in the sea islands along the coasts of Georgia, Florida, and South Carolina, and in certain near-by regions. It is in great demand for the manufacture of fine yarns, laces, mercerized and imitation silk fabrics, and automobile tire cloth and sells at prices



Yearbook Separate 878, U S Dept of Agr.

FIG. 64. — COTTON ACREAGE, 1919 (Each dot represents 10,000 acres)
Note the close correspondence of the regions of cotton production with regions of tenant farming in the South.

from two to three times as high as those of upland cotton. American cotton which has fibers less than one and one-half inches is classed as upland cotton.

Upland cotton is divided into a number of subclasses differing mainly in length of staple but identified with certain regions of production — "Atlantic upland," or "short staple," cotton, varying in length from five-eighths to one inch; "Gulf," or "Western," cotton and "Texas" cotton, characterized by a staple of from one to one and three-sixteenths inches in length. A still longer staple, averaging one and three-fourth inches, produced in the bottom lands of the Mississippi River and tribu-

taries, is known by various names as "benders," "peelers," "rivers," "creeks," and "quarters." The short fiber of cotton which adheres closely to the seeds of upland cotton and is obtained by reginning cotton seed is called "linters."

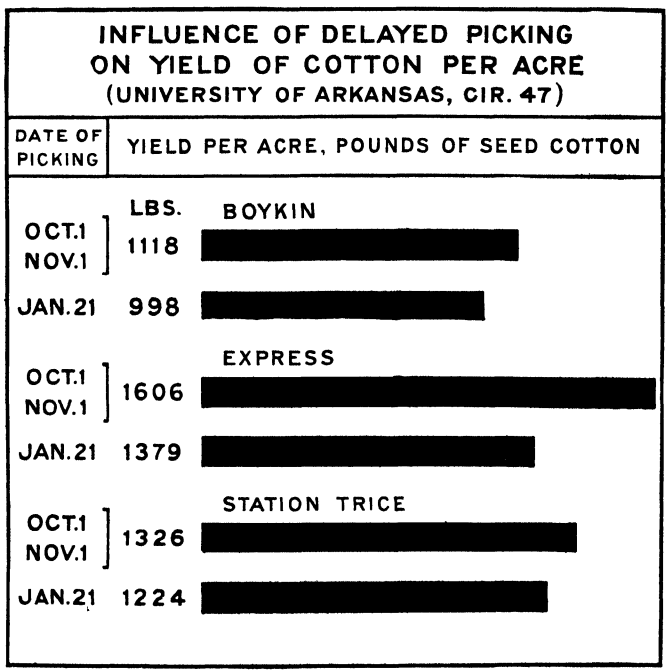
Varieties of Egyptian cotton, characterized by a staple varying from one and one-fourth to one and five-eighths inches, produced in various irrigated districts in the Southwest, amounted in 1920 to about 175,000 bales.

Through long usage seven main grades have come to be generally recognized in American cotton markets. Arranged in order from best to worst in quality, these are: fair, middling fair, good middling, middling, low middling, good ordinary, and ordinary. Middling is the basis grade — the grade in terms of which trading for future delivery is generally carried on and which is used for price quotations. The difference between any two grades is considerable, amounting to as much as a half cent or more a pound. Consequently intermediate, or half, grades are recognized by the application of the adjective "strict." Thus, strict middling is half way between middling and good middling. These grade differences are based mainly on the amount of trash and other foreign matter in the cotton. Color is commonly recognized by adding an adjective expressing color to the grade name of the cotton — as, for instance, white middling, tinged middling, stained middling, etc.

In order to remedy uncertainty and lack of uniformity in the process of grading cotton, the Federal Bureau of Markets has devised a system of standard grades based on sets of uniform samples of cotton prepared by experts in judging cotton, and these grades have lately been adopted in the principal European markets.

III. Ginning. — Sea-island cotton lint and the Egyptian varieties are separated from the smooth seeds by means of the roller gin, instead of by the saw gin, which is used for the upland varieties.

Many planters own their own gins, which they employ exclusively for their own crop of cotton; others maintain gins principally for their own crop but also do some toll ginning.



Farmers' Bulletin 1121, U. S. Dept. of Agr.

FIG. 65

Delayed picking lowers grade and reduces return.

Throughout the South there are large numbers of toll, or public, gins. Toll ginning frequently results in poor preparation for market. A large number of samples secured by the Bureau of Markets showed that ten per cent of the samples had been

injured through too rapid operation of the gins to such an extent as to lower it one full grade.[1]

IV. Baling and tare. — American upland cotton is ordinarily pressed at the gin into what is known as a "flat bale," which is normally 54 × 27 × 45 inches, weighing about five hundred pounds. The total weight of the bales is divided by five hundred to obtain the number of "statistical" bales. Sea-island cotton that goes to the Charleston market is put up in loosely packed bags of about three hundred to four hundred pounds.

Since flat bales are too bulky for economical shipment abroad, they are customarily compressed in large cotton compresses. This reduces the thickness about one half. Cotton compresses are usually owned by a railroad company, which charges about ten cents per hundred pounds for compressing the bale. There is a tendency at the present time to establish compresses in connection with cotton gins. When bales are compressed at a gin, a saving of one half is effected in the number of cars required for shipment to the compress. It is doubtful, however, if a gin compress can economically be operated in connection with gins of a capacity less than fifteen hundred bales. Some gins operate a baling machine which produces round or cylindrical bales, weighing about two hundred and fifty pounds.

Upland cotton bales are ordinarily covered with a loosely woven jute cloth and bound with iron hoops — in the case of sea-island cotton, the covering is sewed on the bale. "Taken altogether it is generally admitted that the American upland bale is the clumsiest, dirtiest, most expensive, and most wasteful package in which cotton or, in fact, any commodity of like value is anywhere put up."[2] This is due to the lack of protec-

[1] Taylor, Fred, "Relation between Primary Market Prices and Qualities of Cotton," *Bulletin 457*, Office of Markets, United States Department of Agriculture.

[2] "The Cotton Plant," *Bulletin 33*, Office of Experiment Stations, United States Department of Agriculture (Washington, 1896), p. 362.

tion from rain and mud after it is packed; to the practice of handling it with sharp hooks, which tear the covering; and to the custom of sampling — that is, gouging portions of cotton out of the bale for use as samples in the trade.

The last-mentioned custom is one that appears especially unnecessary and undesirable. The cotton taken from the bale is frequently not representative of the contents of the bale. It has been suggested that sampling should be done at the time cotton is ginned, that the gins be required to put only cotton of uniform quality in the bale, and that measures be taken to preserve the identity of each sample and of the bale from which it is taken.

The custom of the cotton trade has resulted in the allowance of certain fixed weights to be deducted from the gross weight of the bale on account of the covering and ties, which are worth very much less per pound than cotton. This allowance is known as "tare" and varies from 22 to about 26 pounds in different markets.

One of the unfortunate results of the present tare rules is that the American shipper adds several pounds of unnecessary bagging to the bale in order to bring the amount of tare up to the Liverpool allowance. Consequently the export trade is burdened with the extra cost of freight and insurance on this superfluous weight.[1]

V. Local storage of cotton. — It is desirable that farmers provide facilities for storage of seed cotton until it can be conveniently ginned. The advantages of this have been stated as follows: (*a*) If cotton is allowed to "sweat" for some time before it is ginned, there probably occurs a diffusion of oils through the lint which improves the luster and strength of the fiber. (*b*) It is said that storage makes possible a more complete separation of cotton seed from the fiber. (*c*) There will

[1] Special Consular Reports on Cotton Tare, *House Document No. 577*, 62d Congress, 2d Session.

be a more uniform distribution of moisture throughout the cotton. (*d*) Loss of time in awaiting a turn at the gin is avoided. (*e*) Prevention of injury to fiber due to hasty ginning and the mixture of seed and of fiber of varying quality through failure to clean the gin rolls and conveyors in the rush season.[1] Contrary to common opinion, seed cotton may be stored in considerable quantities without heating, provided it is frequently forked over.

At present the facilities for protecting cotton bales awaiting shipment at gins and other points are entirely inadequate. Cotton bales are exposed to the weather and the wind, resulting in a large amount of damage. In fact, the total amount of "country damage" to cotton has been variously estimated at from $30,000,000 to $70,000,000 a year.

A survey of cotton warehouse facilities, made in 1914, shows that there is a probable warehouse capacity equal to the largest crop produced in the South, but the storage capacity is very unequally distributed. Moreover, the same bale of cotton must be stored more than once on its way to market — at gin, compress, primary market, seaport, and cotton mill.

There has been a strong belief among Southern farmers that there should be numerous small local warehouses easily accessible to the farmer. However, such a policy may be carried too far. In the first place, permanent storage space must be provided in the larger primary markets and export centers, involving a certain amount of duplication. Moreover, in order to meet the great variations in the size of local crops, as well as in the farmers' desire to hold their crops, a larger amount of storage space would be required than if storage facilities were concentrated at strategic railway centers. Finally, the cost of small warehouses is much greater in proportion to storage space than the cost of large warehouses, especially if adequate precautions are taken against fire.

[1] Brand, Charles J. "Improved Methods of Handling and Marketing Cotton," *Yearbook* United States Department of Agriculture, 1912.

As a matter of fact, a large number of the small warehouses have been poorly constructed at excessive cost, provide very poor protection against fire, and are operated at undue expense. It has been estimated that for the South as a whole the saving in insurance would be sufficient to pay twelve to fourteen per cent on the cost of replacing all the warehouses of the South with properly constructed storage houses.[1]

Hitherto, local warehouse receipts have not been sufficiently safe security for cotton loans, for the receipt is not sufficient guaranty to the lender that the warehouse company is financially reliable; that the cotton is adequately stored and protected; that the cotton which it represents is of the grade indicated; that there is not some prior lien on the cotton; or even that the receipt itself is not fraudulent.

The need for standardized warehouse receipts is partially met by the United States Warehouse Act, passed in 1916. This law provides that warehouses may become known as "United States bonded warehouses" provided they give bond for the faithful performance of the duties prescribed in the law. Provision is made for careful inspection of the financial standing of the warehouse company, the physical character of the plant, the qualifications of the management for grading and weighing farm products, and for the issuance of a standard warehouse receipt. Certain Southern states have also provided legislation for state-regulated bonded warehouses.

VI. The local marketing of cotton. — 1. *Local marketing agencies.* — Before the Civil War the greater part of the cotton crop was shipped by large planters to cotton factors or merchants in the large seaboard or river ports. The system still continues here and there, mainly in the sea-island cotton

[1] Nixon, Robert L., "Cotton Warehouses," *Bulletin 216*, Office of Markets, United States Department of Agriculture. On methods of construction, see "Cotton Warehouse Construction," by the same author, *Bulletin 277*, Office of Markets, United States Department of Agriculture.

region near Charleston and at points along the lower Mississippi.

The rapid building of railroads in the South and the breaking up of plantations have resulted in the development of many small market towns which are the centers for the interior buying of cotton.

Since little equipment is required for buying cotton, there are numerous cotton buyers of various kinds. Some are seasonal buyers who go from place to place, like the " scoop shovelers " in the Grain Belt. In towns of considerable size there are one or more firms permanently established in the cotton buying business, either as a principal line or as a side line in connection with a store, a bank, a coal or lumber yard, or a gin. Frequently, the local buyer is a representative of a large exporting house for which he buys according to instructions as to price to be paid. At times, however, a local buyer may purchase cotton on his own risk and either resell it to an established local representative of a cotton export company or ship it on consignment to the seaport or large interior market.

Numerous plantation owners or operators and thousands of small local stores, frequently operated in connection with plantations, lend money to tenants or croppers with the understanding that the farmer's crop must be sold to or through the lender.

2. *Local prices.* — In the grain trade local prices for grain are based on spot prices for grain in the primary market. In the case of cotton, however, the basic price from which local prices are determined is the price for future delivery. It is customary for exporting firms or firms in the large interior markets to instruct their local buyers to purchase cotton at a certain number of " points " — that is, hundredths of a cent — " off " or " on " (above or below) the prevailing price of middling for future delivery. From this price the local buyer deducts the cost of shipment to the market where the cotton is to be sold, together with insurance, cost of compression, and an

allowance for expenses and profits. To some extent, of course, local competition may determine the amount of the margin between local buying price and the price upon which it is based.

Investigations carried on by the United States Bureau of Markets into the relationship between the prices of cotton in numerous local markets in Oklahoma and the Galveston spot price showed that the average of the former differed from that of the latter by less than the cost of compression, insurance, and freight to the port.[1] It is difficult to explain this curious fact which might imply that on the average local buyers are losing money by the buying of cotton. It may be due partly to the fact that unusually high offers are made for lint cotton in order to obtain special profits for the purchase of seed. There may also be a profit due to buying grades other than middling at prices that bear for the buyer a profitable relationship to the price of middling or to the fact that dealers do not allow enough for the superior staple of Oklahoma cotton.

Great local variation was shown between different towns in the state. In some towns the cost of shipment was considerably higher than was justified by cost of shipment to the port; in others, lower. Moreover, the relationship between local price and port price was found to be constantly varying even in the same town. On three different dates during the same season, in the town of Norman, the margin of difference on the same day varied from $1.05 per bale to $3.10. One of the most striking facts, however, was the great variation in the same town and on the same day between different bales of cotton, all of which were graded by the government as middling. In some cases the range of variation was as much as $6 per bale. This was probably due to one or more of three causes: (*a*) the inaccurate grading of cotton; (*b*) the lack of knowledge of dealers

[1] Sherman, Wells A., Taylor, Fred., and Brand, Charles J., "Studies of Primary Cotton Market Conditions in Oklahoma," *Bulletin 36*, Office of Markets, United States Department of Agriculture.

of the prices paid by one another — that is, ineffective competition; or (c) a tendency to buy according to the bargaining ability of the seller.[1]

The range of variation between bales of the same grade was generally greater for the grades above and below middling than for middling. The extreme variations were as follows: strict middling, $7.25; low middling, $12.50; strict low middling, $10.00; low middling, tinged, $19.25. That a variation of $19.25 could occur in the prices of different bales of cotton of the same grade, in the same place, and on the same day — particularly in a town where there were twenty-seven cotton buyers — is a striking revelation of the inaccuracy of local price-making for cotton.[2]

The adjustment of price to grade was also shown to be in the highest degree inaccurate, a result confirmed for the South as a whole by a more recent investigation.[3] The price discrimination according to quality was far less than it should be, largely due to the ignorance of grades on the part of local buyers and to the tendency to grade nearly all cotton as middling unless the difference was too obvious to be disregarded. In a number of instances a bale was sold at a lower price than a bale one full grade inferior, and in some cases a bale sold at less than other bales three full grades below it in quality.[4]

One important reason for the general disregard of grade differences lies in the fact that cotton is sold on the large markets in uniform lots of one hundred bales each. A lot of mixed quality is not sold to good advantage. Consequently the local buyer cannot offer an adequate premium on cotton of superior

[1] Cf. *Bulletin 36*, Office of Markets, United States Department of Agriculture.

[2] *Id.*

[3] Taylor, Fred., "Relation between Primary Market Prices and Qualities of Cotton," *Bulletin 457*, Office of Markets, United States Department of Agriculture.

[4] *Bulletin 36*, United States Department of Agriculture.

quality when only a few bales of the same grade are available.

When in addition to the disregard of grade differences we also consider that there is a tendency for local buyers to disregard length of staple, it will be clear that there is but little inducement for farmers to try to improve the quality of cotton.

3. *Need for local coöperation in the marketing of cotton.* — Broadly speaking, there is great need to remedy by organization some of the local evils in the ginning, storage, and marketing of cotton lint and cotton seed, for it is precisely in the local conditions of marketing that the greatest improvements can be made.

The need for community organization starts with the production of cotton. As already noted, it is of the highest importance that uniformity in length and quality of staple be attained for the community as a whole if cotton is to sell to best advantage, and this means both uniformity in the bale and uniformity in the one hundred bale lots which market custom demands. The whole community suffers in reputation for the poor quality of a few growers, and, on the contrary, when the amount of cotton of good grade is small, it is not likely to command a premium in the market. Moreover, if a few farmers grow inferior cotton, it will reduce the quality of good cotton in the community through cross-fertilization.

In order to achieve this desirable uniformity a growers' organization should agree on a common type of cotton and adopt rules for the selection of seed and rigid inspection of cotton in the field in order to eliminate "sports." It is highly important also that the local organization strictly control the process of ginning, in order to eliminate seed mixture, too rapid ginning, crushing of seed, lack of uniformity in the quality of cotton put in the bale, and dishonesty in baling cotton. This community control of the gin, whether accomplished by coöperative ownership or by coöperative regulation, can be employed to eliminate the advantage now sometimes taken by the ginner in buying

the cotton and cotton seed of the individual farmer, as well as in the charges for ginning.

A growers' association offers further opportunities for improvement of methods of cultivation and for arriving at agreements for a uniform time of planting early season varieties in order to avoid the boll weevil and for the early destruction of stalks and other rubbish in the fall, for lack of uniformity of policy greatly reduces the effectiveness of these methods of limiting the ravages of the boll weevil.

After these various steps have been taken, the community organization is essential in deriving the full benefits from these advantages in the process of marketing. It has been shown above that at best the present system of local marketing is characterized by a large amount of inaccuracy in the grading of cotton, by a general failure to make adequate distinction in the prices allowed for grade differences, and, without doubt, in a certain amount of individual injustice — especially in the case of the less intelligent and less independent producers.

The position of the farmer in the marketing of his product is greatly strengthened by the organization of coöperative warehouses, a number of which have been formed. In some cases these enterprises originally organized mainly for the storage of cotton and for obtaining loans have undertaken the coöperative sale of the farmers' crop. It appears probable that the maximum advantages from coöperation are gained by combined organization for standardizing production and for storing, financing, and marketing the crop.

It is clear that many advantages could be attained by a strong federation to aid the local coöperative organizations in the accomplishment of the objects for which they are organized, by promoting unity of policy in buying and selling; uniform methods of accounting; careful investigation before locating warehouses; wise selection of local managers; economy in the employment of experts in grading; centralization of storage

warehouses at points where demand for storage is great enough to justify the building of most economical types of warehouses; most economical use of warehouse space by proper distribution of cotton among the different warehouses; the obtaining of loans on cotton at lowest terms; and other advantages.

VII. Stages in the marketing of cotton beyond the local market. — The small local markets of the South, where cotton is first brought for sale, are frequently referred to as primary markets. In the grain trade this term is usually applied only to a few large cities which are concentrating points for large quantities of grain. In the cotton trade such points may be called interior points of concentration, to distinguish them from local markets on the one hand and from the large ports on the other hand.

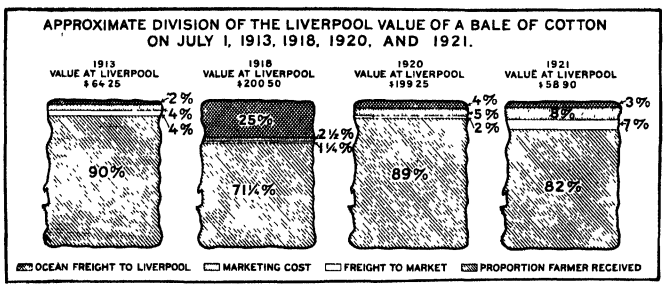
About half the entire cotton crop is first sent to an interior point of concentration, of which there are upwards of seventy. The larger part of the remainder of the cotton is shipped direct from the local market to one of the large ports from which cotton is exported.

The interior points of concentration, as well as the export centers, have ample facilities for the compression and storage of cotton. Cotton is stored temporarily while awaiting shipment, and large quantities are stored for considerable periods of time, awaiting a more favorable price. Many of these points contain regularly organized cotton exchanges which regulate the buying, selling, and storage of cotton.

Much cotton is consigned to these markets by planters, local ginners, and other interior buyers for sale on commission. Also, large cotton firms receive cotton bought for them by their representatives and traveling buyers in the smaller local markets. These dealers may also be exporters and arrange with European buyers for shipment of the cotton to Europe, sometimes on through bills of lading from interior compression points. Large

export firms, however, are likely to be located in the ports, although they generally maintain representatives in the large interior points of concentration.

In the eastern Cotton Belt the interior buyer sells to brokers at the chief ports and even to the spinners themselves. Much cotton is also shipped by the local agents of export houses direct to Europe on through bills of lading, according to instructions from the central office.



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FIG. 66

Before the beginning of the World War the proportion of the Liverpool price of cotton received by American farmers was 90 per cent, while 10 per cent was required to move the crop, 6 per cent of which was cost of transportation, and 4 per cent went to the marketing agencies. The war resulted in greatly increasing the proportion of the price per bale devoted to transportation and marketing. Since the war there has been some reduction in the proportion required for transportation and marketing, but the farmers' share up to 1921 was still less than it had been in 1913.

VIII. Costs of marketing cotton. — As in the case of grain, the aggregate costs of marketing cotton are not a large proportion of the selling price of the product. It was estimated in November, 1911, that the total expense of moving cotton from the gin to the seaports averaged about eight tenths of a cent per pound, — that is, added about nine per cent to the farm price — while the entire expense of moving the cotton from the farm to Liverpool, including transportation charges and pay-

ment of the various middlemen engaged in moving the crop, added about fifteen per cent to the farm price.[1]

QUESTIONS ON THE TEXT

1. What are the principal classes of American cotton and what are distinguishing characteristics of each class?
2. Describe the terms employed in the grading of cotton.
3. Describe the methods of cotton ginning and the problem of improving the process of ginning.
4. What are the principal methods of baling cotton?
5. What is meant by tare?
6. Discuss the problem of providing better storage facilities for cotton.
7. What important changes in the local marketing of cotton have occurred since the Civil War?
8. Is the local price of cotton more closely related to the spot price or to the future price? Explain.
9. What did the government study of local cotton marketing conditions in Oklahoma show as to (*a*) the relation of local prices to port prices; (*b*) the relative prices in different local markets; (*c*) relative prices of different grades?
10. In what ways could local coöperative marketing bring about improvement in existing methods of marketing cotton?
11. Describe the methods by which the marketing of cotton is effected after the cotton leaves the local market.
12. Discuss the cost of marketing cotton.

SPECIAL PROBLEMS

1. Prepare a table showing the average amount of cotton produced annually in each state during the last five years. Compare this with similar figures for the five years ending in 1914. Discuss the significance of the changes in the several states.
2. Make a table showing the amount of American cotton shipped to each of the various countries to which we export cotton.
3. Make a table showing the amount of cotton raised by each of the principal producing countries of the world.

[1] "Systems of Marketing Farm Products," *Report No. 98*, Office of Secretary, United States Department of Agriculture, p. 45. For discussion of the methods of dealing on the exchanges, see p. 480.

4. Make a table showing the average annual variation of the farm price of cotton for the past ten years. Estimate the cost of holding cotton, and determine the month in which the farmer could have sold to best advantage. Indicate the same for each year of the ten years. (For statistics see latest *Yearbook* of Department of Agriculture.)

5. Write an essay describing the system of federal standard grades.

6. Describe the federal standard cotton warehouse law and its operation.

7. If you live in a cotton-producing community, write an essay presenting in detail a plan for improving the system of local marketing.

8. Describe the Cotton Futures Act.

9. Name the principal interior wholesale cotton markets and the principal ports shipping cotton.

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CHAPTER XX

MARKETING PROCESSES — MILK AND BUTTER

The Marketing of Milk

I. Sources of supply
II. Direct and indirect methods of distributing
III. Transportation of milk
IV. Wholesale milk distributors
V. Classes and grades of milk
VI. Methods of buying milk wholesale from the farmer
VII. Costs of marketing milk
VIII. Organization of milk producers

The Marketing of Butter

I. Production of butter
II. General movement to market
III. Marketing at points of production
IV. Methods of packing
V. Shipment to market
VI. Wholesale markets
VII. Storage and seasonal variations in prices
VIII. Costs of marketing butter
IX. Market classes and grades
X. Market News Service

It can scarcely be said that the market for dairy and poultry products is yet world-wide or even nation-wide. In many parts of the country the marketing still retains much of its old local character, and there are considerable differences in the levels of prices in different localities. Uniformity in grades and standards is not fully achieved, and market information is not so com-

plete and widely diffused as is the case with grain, cotton, and live stock.

The Marketing of Milk

I. Sources of supply. — The greater part of the milk supply of a city must reach the consumer within forty-eight hours after it is taken from the cow. When cities are small, the problem is comparatively simple, but large cities are compelled to obtain portions of their supply from a considerable distance. The bulk of the supply for Milwaukee and Detroit is obtained within a radius of thirty miles of each city, while the milk radius of Chicago is from seventy to one hundred miles in extent.[1] The Boston area extends into southern Quebec, two hundred and fifty miles away, and small portions of the New York supply come several hundred miles.[2]

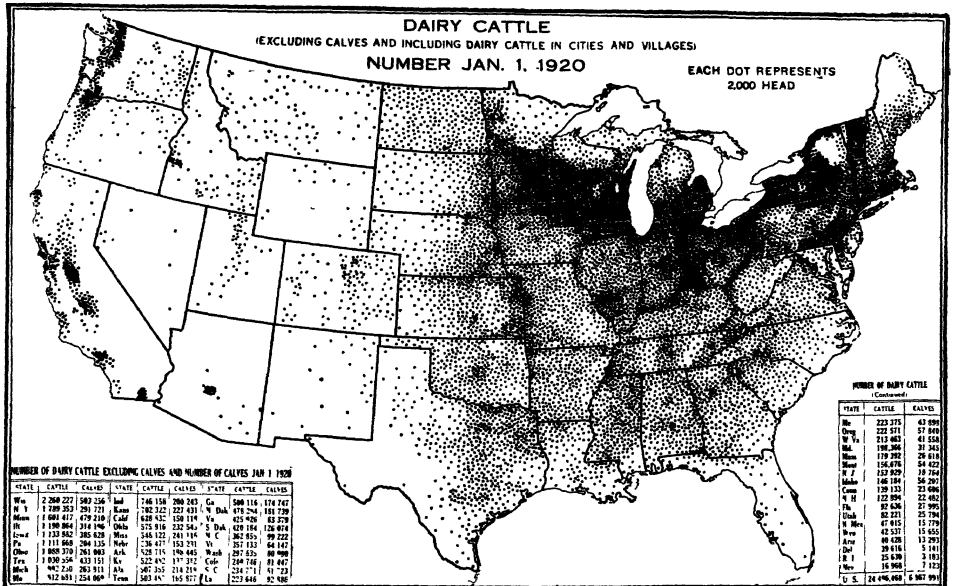
Since most of the milk for city consumption must be obtained in the vicinity, the price is usually higher than the price paid for milk by creameries, cheese factories, and condenseries, the products of which can be shipped economically many hundreds of miles.[3] Consequently, it is usually not profitable for factories manufacturing milk products to operate within this area except for the purpose of utilizing the surplus milk supply in the season of heavy production.

II. Direct and indirect methods of distributing. — It is difficult for the farmer to produce milk and deliver it at retail

[1] Hibbard, B. H., and Erdmann, H. E., "Marketing Wisconsin Milk," *Bulletin 285*, Wisconsin Agricultural Experiment Station. Clement, Clarence E., and Warber, Gustav P., "The Market Milk Business of Detroit, Michigan, in 1915," *Bulletin 639*, United States Department of Agriculture.

[2] *Investigation and Analysis of the Production, Transportation, Inspection, and Distribution of Milk and Cream in New England.* Issued by Boston Chamber of Commerce, 1915.

[3] See, for instance, "The Market Milk Business of Detroit, Michigan, in 1915," p. 7.



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FIG. 67. — NUMBER AND DISTRIBUTION OF DAIRY CATTLE, 1920

Nine tenths of the dairy cattle are in the East. The dairy cattle in cities and villages were less than four per cent of the total number.

to consumers when his farm is more than eight miles from his market. Within this zone, however, dairymen generally find it profitable to sell their milk direct to consumers.

Beyond the zone of direct marketing milk producers ship their milk to city distributors, who prepare it for sale and distribute it to consumers at wholesale or retail. For large cities it is possible to obtain only a small part of the supply direct from the producer. For instance, over ninety-seven per cent of the milk supply of Milwaukee is marketed indirectly.[1]

For very large cities a further stage in the development of the marketing of milk occurs with the establishment of country stations for the purposes of collecting milk from the farmers, preparing it for shipment, and sending it to the city. At distances greater than twenty-five miles it becomes desirable to collect milk at stations by means of wagons sent through the country for the purpose. At each of these country stations there is a plant equipped for handling milk.

III. Transportation of milk. — Milk is hauled to the city in wagons, in automobile trucks, and by electric and steam railways. Commonly, the milk shipped by rail is carried on passenger trains or electric cars as baggage or express. However, from long distances milk is sometimes sent by freight in specially constructed milk cars provided with mechanical refrigeration.

IV. Wholesale milk distributors. — Those firms which are engaged in purchasing milk at wholesale from the producers for the purpose of distributing it to consumers differ greatly in size of business and methods of operation. The number of dealers is large. In Detroit there were one hundred and forty in 1915, and in Milwaukee, seventy-seven in 1916. However, most of these are small dealers operating one or two milk routes. In Detroit two dealers, each of whom averaged 117.5 routes,

[1] Hibbard, B. H., and Erdmann, H. E., "Marketing Wisconsin Milk," *loc. cit.*, p. 40.

sold 43.2 per cent of the milk supply, and thirteen dealers sold 71.2 per cent.[1]

The tendency toward concentration in the business of distributing milk is due to a number of causes, including the necessity of bringing milk from a great distance, involving the operation of country collecting stations; the difficulty of conforming to constantly increasing sanitary requirements; and certain economies in retail distribution effected by large-scale distribution. These economies may be summarized as follows:

1. It is possible to balance daily variations in the volume of demand on one route by opposite variations on other routes.

2. Large distributors can adjust themselves to the seasonal variations in demand and supply by operating creameries or condenseries to use the surplus of milk when demand declines.

3. When a dealer controls a large part of the total milk business of a city, he is able to eliminate a great deal of the duplication in routes. For instance, it was found that the number of times each mile of street was covered by milk wagons in various Wisconsin cities was as follows:[2]

Milwaukee	5.71
Oshkosh	3.75
Beloit	2.67
Eau Claire	2.42
Madison	3.01

The average distance traveled by each of one hundred and eighty-five milk wagons within the city limits was 8.51 miles, and it was estimated that if a wagon could deliver milk from one house to the next with no gaps, the same amount of milk could be delivered in fifty-five per cent of the time now required on the ordinary route.[3]

[1] "The Market Milk Business of Detroit," p. 19.

[2] Hibbard and Erdmann, "Marketing Wisconsin Milk," p. 30.

[3] *Ibid.*, pp. 67–69.

In spite of the advantages of the large distributors, the small distributors hold their own tenaciously and often undersell their larger competitors. It is the special function of the large dealer to bring sufficient milk from a distance to satisfy the demand. Naturally, this part of the supply is obtained at a greater expense than that which is sold direct to consumers by farmers from the immediate vicinity of the city, and under competition the general price of milk must be high enough to defray the expense of bringing in this more costly portion of the supply. A Minneapolis study showed an expense by direct marketing of $0.0185 per "point" (a quart of milk or half pint of cream), while the expense by the indirect method was $0.036 per "point."[1]

V. Classes and grades of milk. — Generally speaking, the consumer does not value a superior quality of milk highly enough to pay any substantial difference in price in order to obtain it. This fact has been the greatest obstacle to the efforts to obtain a more healthful city milk supply.

Several classes of milk are commonly recognized, including certified milk, inspected milk, and standard milk. Medical associations in different states have promulgated certain standards which must be fulfilled in the production and distribution of "certified milk." The requirements are usually so rigid that production is very expensive, and dairies producing real "certified milk" are not numerous. There is the greatest variation in different cities in the control exercised over the use of the term "inspected milk." In some cities it means practically nothing. In others it stands for compliance with strict rules, though the requirements are not so strict as they are for certified milk. The term "standard milk" is ordinarily applied to milk which satisfies the general legal requirements

[1] Cavert, W. L., "Milk Distribution in Minneapolis and St. Paul" in *Studies in the Marketing of Farm Products*, edited by L. D. H. Weld, pp. 79, 86.

for ordinary milk. There is great variation among American cities, both as to requirements and as to strictness of enforcement.

Many grade names are in current use in various cities which have no standard and uniform significance. A few cities have provided by law for definite grading. Thus in New York City four grades are recognized by law, as indicated in the following table of requirements:[1]

TABLE 21. GRADES OF MILK IN NEW YORK CITY

Grade	Bacteria Count		Barn Score
	Before Pasteurization	After Pasteurization	
Grade A, raw . . .	Milk, 60,000 Cream, 300,000		75
Grade A, Pasteurized	Milk, 200,000	Milk, 30,000 Cream, 150,000	68
Grade B, Pasteurized outside of city . .	Milk, 300,000 1,500,000 in city	Milk, 100,000 Cream, 500,000	55
Grade C, Pasteurized, manufacturing purposes only	No limit	Milk, 300,000 Cream 1,500,000	40

All milk and cream except grade A, raw must be Pasteurized before sale.

VI. Methods of buying milk wholesale from the farmer. — A great deal of milk is bought by quantity (the hundred pounds, eight-gallon can, etc.) without reference to its quality. A common variation of this practice is to make some kind of allowance for the percentage of butter fat. Rarely are other qualities considered in the purchase of milk. Occasionally, large firms will reject or dock milk which is watered or which is obviously rotten. However, only a few large dealers pay a premium for milk produced under specially clean and sanitary conditions.

[1] "Milk and Cream in New England," p. 47.

Sometimes dealers enter into contracts with farmers, running for periods of from six months to a year. These contracts require the farmer to supply a certain minimum quantity of milk, the minimum being frequently less for the winter than for the summer months. Sometimes, a fixed price by the year is specified in the contract.

Some small dealers are very unreliable and fail to meet their obligations to farmers. Many states have laws which require the dealer to give bond for the protection of the farmer. In some large cities a milk broker brings buyer and seller together, assuming the responsibility of recommending only honest dealers.

VII. Costs of marketing milk. — Various studies made before the late war indicated that the farmer received about sixty per cent of the consumers' price. A Massachusetts study made in 1915 showed an average marketing cost of 2.64 cents per quart for eighty-five distributors.[1] A study of the milk business of Detroit in the same year showed an average cost for distribution of 2.79 cents a quart.[2]

	Cents a Quart	Per Cent
Amount paid to farmer	3.276	50.5
Amount paid for transportation	0.489	7.5
Expense of handling at plant	1.172	18.0
Expense of delivery	1.541	24.0
	6.478	100.0

The details of the distribution of the consumers' dollar in the marketing of milk, as shown by investigations in Chicago and two Wisconsin cities, were estimated as above for the period just preceding the rise of prices of 1916.[3] It will be noted that

[1] Statement of Professor Cance at National Conference on Marketing and Farm Credits, 1916, *Proceedings*, p. 429.

[2] *Market Milk Business of Detroit*, pp. 13, 24.

[3] Hibbard and Erdmann, "Marketing Wisconsin Milk," p. 47.

almost exactly one half of the cost of marketing milk is due to the expense of delivery.

The cost of retailing milk is probably higher than it would otherwise be, because consumers demand early delivery. A distributing firm must employ wagons and drivers enough to deliver all of the milk within a few hours in the early morning. The cost is also increased somewhat by the growing demand for milk in pint bottles. There are considerable losses from poor collections. There is also loss from shrinkage, estimated at ten per cent when milk is dipped from the can and at about three per cent when milk is bottled.[1] Bottle breakage is a considerable item. It was found by the United States Dairy Division that the average number of trips for each bottle is twenty-two and one half. An even greater source of loss comes from the theft of bottles. The costs of hiring drivers and maintaining teams (for experience seems to indicate the greater economy of horses for retail delivery and of gasoline trucks for wholesale), of course, are the largest items.

VIII. Organization of milk producers. — There are several different types of organizations for marketing milk. In several cities — for instance, Johnstown, Pennsylvania — there are coöperative milk distributing companies. These organizations buy milk from their members and others and distribute it in much the same manner as do the private distributors. The advantages to be gained by this form of organization are not so great as the advantages which may be accomplished by other types of organizations, while the chances of failure are considerable.

A somewhat similar type of organization, though less difficult, is that of the Producers' Dairy Association, with headquarters at Cleveland,[2] an organization modeled after a similar associa-

[1] Cavert, W. L., *op. cit.*, p. 79; Hibbard and Erdmann, *op. cit.*, p. 46.

[2] Taeusch, C. F., "Rural Coöperation and Coöperative Marketing in Ohio, 1913," *Circular 141*, Ohio Experiment Station, p. 22.

tion at Erie, Pennsylvania. The organization maintains a receiving station in the city, where the milk produced by its members is sterilized and bottled and then sold to retail peddlers. The organization charges the producer a commission of two cents a gallon for handling the milk, returning any surplus over and above the actual expenses in proportion to the amount of milk furnished by each producer. The association also protects the farmer against dishonest buyers.

A simple but apparently successful type of organization has been developed in several of the large cities of the United States, including New York, Chicago, Boston, and Milwaukee. In their original form these organizations were merely associations for collective bargaining, somewhat of the character of trades-unions.

In some of our largest cities concentration of control of milk distribution approaches very close to monopoly — monopoly of buying and selling, and such a monopoly may, within certain rather narrow limits, reduce the price to the farmer while raising somewhat the consumer's price. However, it must be recognized that not only is the distributor's power to depress prices to the farmer rather definitely limited by the possibility of his selling milk for other uses to creameries, cheese factories, and condenseries, as well as to other markets, but the power of the farmers' association to raise prices, even when the supply is fully controlled, is limited by the fact that any considerable increase of price must be shifted to the consumer in the form of higher retail prices. The higher price will tend to reduce consumption and at the same time stimulate production. (See p. 501.)

Some of these organizations are increasing their functions beyond those of mere collective bargaining. Both the Chicago and the Milwaukee organizations have formed corporations for the purpose of selling the farmers' milk coöperatively, instead of merely collective bargaining.

One of the weaknesses of local milk producers' organizations revealed by the milk wars is the tendency for dealers to relieve the shortage by importing milk from distant regions, very much as manufacturers import strike breakers. In order to meet this danger several of the important dairymen's leagues formed a general organization at Chicago in 1916 known as the National Milk Producers' Federation.[1]

The Marketing of Butter

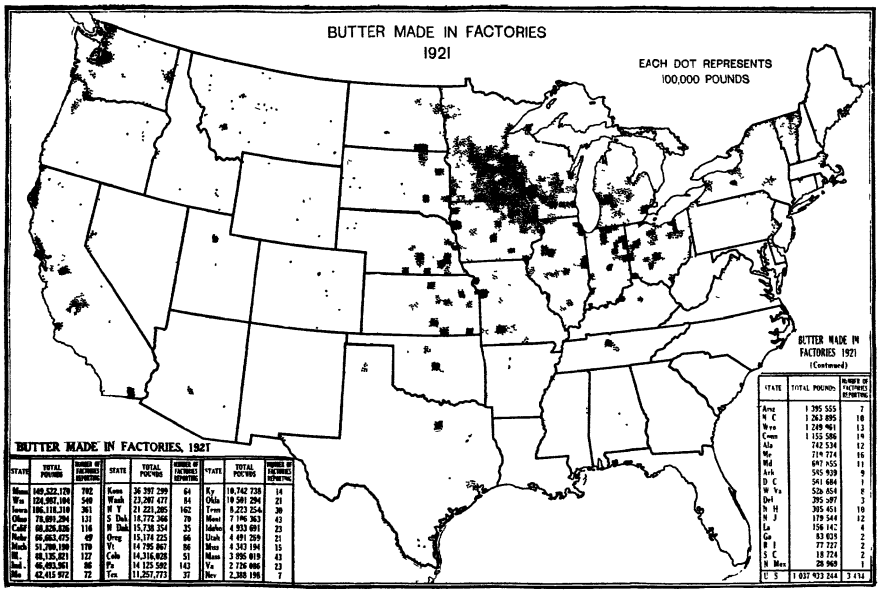
I. Production of butter. — During the past fifty years the marketing of butter has been revolutionized, not only by the concentration of population in cities and improvements in methods of transporting and storing perishable products but also by a series of important technical inventions and discoveries, including the cream separator, the Babcock tester, the method of Pasteurization, the control of fermentation by bacterial cultures, and numerous devices for churning.[2]

As late as 1880 only a little over three and one-half per cent of the butter of the United States was manufactured in creameries. By 1909 approximately two fifths was the product of creameries.

The great majority of creameries draw their supply of cream from the immediate locality. In recent years a type known as "centralizers" has developed. The centralizer purchases cream from a wide territory, sometimes from distances of several hundred miles. Because of the great distances the cream is shipped and the lack of direct control over the quality of cream, the centralizer is handicapped in the production of a high

[1] For account of its formation and its by-laws, see *Proceedings* of National Conference on Marketing and Farm Credits, 1916, pp. 415–418, 421–432.

[2] For an historical account of this development, see Wiest, Edward, "The Butter Industry in the United States," Columbia University, *Studies in History, Economics, and Public Law*, LXIX, No. 2 (N. Y., 1916).



STATE	TOTAL POUNDS	NUMBER OF FACTORIES REPORTING
Ariz	1 395 555	7
N C	1 263 895	10
Wyo	1 249 961	13
Conn	1 155 586	19
Ala	742 534	12
Mo	719 774	16
Md	647 455	11
Ark	545 939	9
D C	541 684	1
W Va	526 654	8
Del	395 387	3
N H	305 451	10
N J	179 544	12
La	156 142	4
Ga	83 631	2
R I	77 727	2
S C	18 724	2
N Mex	29 969	1
U S	1 037 933 264	3 434

STATE	TOTAL POUNDS	NUMBER OF FACTORIES REPORTING
Minn	149,522,170	702
Wis	124,967,104	540
Iowa	106,118,310	361
Ohio	78,091,294	131
Calif	66,826,826	116
Nebr	66,663,475	69
Mich	51,798,189	170
Ill.	48,135,821	127
Ind.	46,455,561	98
Mo	42,413 972	72
Kans	36 397 299	64
Wash	23,297 477	84
N Y	21 221,205	162
S Dak	16,772 368	70
N Dak	15,738 354	35
Oreg	15,174 225	66
Vt	14 795 867	86
Colo	14,316,628	51
Pa	14 125 582	143
Tex	11,257,773	37
Ky	10,742 738	14
Okla	10 501 294	21
Tenn	8,223 254	30
Mont	7 196 363	43
Idaho	4 933 691	23
Utah	4 491 259	21
Miss	4 343 194	15
Mass	3 995 819	43
Va	2 726 486	13
Nev	2,308 196	7

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FIG. 68. — BUTTER MADE IN FACTORIES, 1921

The spotted character of the map, especially in the Corn Belt, indicates the concentration of butter making in relatively few cities.

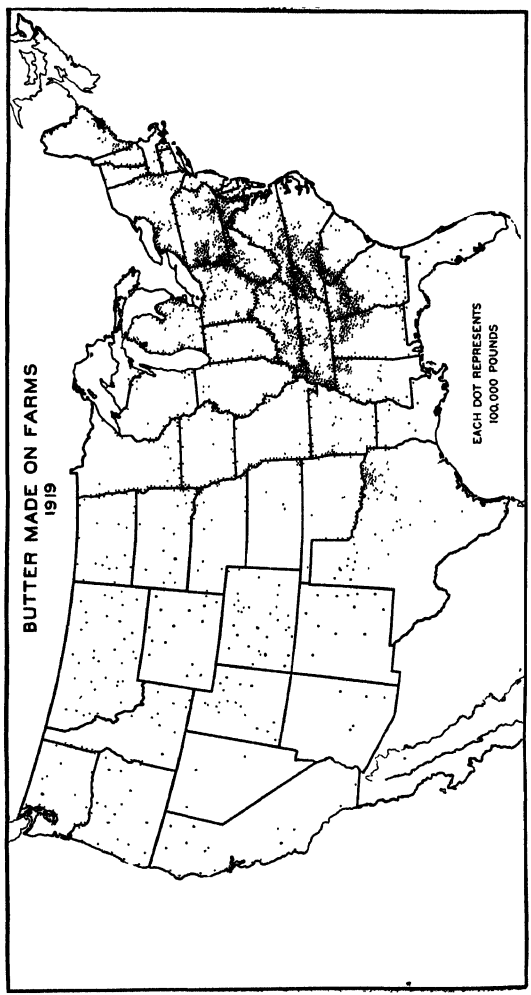
quality of butter. However, this disadvantage is partly offset by scientific and large-scale methods of production. Centralizers are especially adapted to regions where the cow population is not dense enough to support local creameries.

II. General movement to market. — The marketing of butter consists of three principal movements: (1) a movement from the farm or creamery to the consumers in near-by towns and cities, either directly or through retailers; (2) a shipment of butter to primary wholesale markets for distribution in adjacent consuming territory; and (3) a movement of butter to primary wholesale markets, whence it is again shipped to wholesale distributing centers in the East and South.

III. Marketing at points of production. — Butter manufactured on the farm is sold by the farmer to individual customers in near-by towns, to country or village stores, or to produce buyers. Sometimes the store purchases for resale to retail customers and has some regard to quality in method of purchase. Frequently, however, butter is purchased from the farmer with little regard to quality, is all dumped into the same container, and receives little care for preserving the quality. From time to time the mass so collected is shipped to a renovating factory, where air is blown through it, and the butter is mixed with milk. The resulting product is known as "renovated butter." Some of the butter made on the farm (dairy butter) is shipped to primary markets where it is sold by grade.

Some creameries sell butter direct to local retail stores, hotels, and restaurants. However, the larger part of their product is shipped from the creamery to primary markets, some of it in carload lots.

IV. Methods of packing. — The greater part of the butter is shipped to market in bulk, where most of it is retailed from the tub, but there is an increasing tendency for consumers to demand individual packages. The standard size is a pound package, but the demand for one-quarter pound packages is



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FIG. 69. — BUTTER MADE ON FARMS, 1919

Butter made on farms in 1919 constituted 43 per cent of the total production. Most of this farm butter was consumed in the locality where it was produced.

growing. Much of the butter put in cartons is packed by the wholesale receiver, but some of it is shipped from the creamery in this form.[1]

V. Shipment to market. — Throughout the dairy sections of the Middle West the railroads maintain a regular dairy freight service. Butter is collected along the line by "pick-up" service, and at junction points carloads are made up. In less well developed dairy regions, butter is shipped to primary markets by express. From the large distributing centers carloads of butter are sent out to various cities and towns by scheduled freight, and the carload is broken for distribution at various points.

VI. Wholesale markets. — With the exception of New York and Boston, the most important wholesale butter markets of the United States are in the Middle West. Chicago receives about twice as much as any other market. New York and Boston successively rank next to Chicago as butter markets, but a great deal of the butter received in New York and Boston is shipped from other wholesale markets.

In the wholesale market most of the butter is purchased in the first instance by a wholesale receiver, a firm which makes a business of collecting butter from the various points of production. Formerly, much of the butter was merely consigned to the wholesale dealer who sold it on commission, but the practice has developed of purchasing outright. Many of the dealers arrange with the creamery to ship on contract, agreeing to pay regularly a certain margin below the wholesale price in the city — say, two cents.

The wholesale receiver performs a number of important functions. Because of his large business he is able to purchase in carload lots. His general knowledge of conditions of supply and demand in a large city and adjacent territory enables him

[1] For description of the various methods of packing butter, see *Bulletin 456*, United States Department of Agriculture.

to bid accurately for the butter supply. If he finds the market overstocked, he may purchase less or divert some of the supply purchased to other cities, thus assisting in adjusting supply and demand. The wholesale distributor grades the butter received and distributes it according to the quality that will be demanded by different classes of consumers. He also finances the movement of butter by paying transportation and other expenses and by allowing creameries to draw on him for payment on day of shipment. Finally, the wholesaler assumes the function of storing butter in seasons when it is cheap and abundant to be held until it is scarce, thus assisting in equalizing the supply throughout the year.

In large distributing centers like New York, a jobber intervenes between wholesale receiver and retailer. The jobber buys from the wholesaler in lots of from ten to fifty tubs. He sells to grocery stores, hotels, restaurants, hospitals, and other large retailers of food, specializing in a particular class of trade.

The wholesalers who deal in butter are usually organized in exchanges for dealing in general produce. Unlike the grain and cotton exchanges, there is little buying and selling of butter in the exchange. The principal object of the exchange is collection and publication of information, regulation of trade practices, definition of grades, and employment of butter inspectors to settle disputes about grades.

VII. Storage and seasonal variations in prices. — In order to equalize the supply throughout the year, some of the butter received in the summer months must be stored. June storage butter is kept an average of 5.32 months.[1] Statistics of the cold storage of butter in 1914 showed that eighty-one per cent of the butter stored was delivered into storage during the four months May to August, inclusive. The charges in 1916 for storing butter varied from about one-eighth to one-fourth cent

[1] Weld, L. D. H., *The Marketing of Farm Products*, pp. 150–151.

a pound per month, according to the size of the lot stored. The cost of storage for six months, including interest and insurance, was approximately one and one-half cents per pound.[1]

The price of butter may vary considerably from one season to another in particular years on account of unusual changes in conditions of supply and demand, but the average seasonal variation over a long period of years is not marked. For the period from 1902–3 to 1910–11 the average price of storage butter in December was only four cents higher than the average price of fresh butter in June, an increase of about seventeen per cent. During the same period the average price of fresh butter increased six and one-half cents from June to December, an increase of about twenty-eight per cent.[2]

Various methods of arriving at butter quotations are employed in different wholesale markets. Under the call-board method dealers meet at a regular time. Formal offers and bids are made, which are written in plain view on a blackboard. This is an attempt to test the market by actual transactions. Gradually, this method has been abandoned. San Francisco is the most important market in which the method is retained. In Philadelphia the method has been modified by taking a vote of all members of the exchange at the end of each day's trading. The prices thus arrived at are then written on the board and become the official quotations. In some markets a committee of the exchange canvasses the general conditions of the trade and determines the representative price. In the two most important markets, Chicago and New York, the quotations are determined in each case by representatives of an important trade journal, whose management has acquired such a reputation for impartiality, integrity, and good judgment that its quotations are unquestionably accepted.

[1] Potts, Roy C., and Meyer, H. F., "Marketing Creamery Butter," *Bulletin 456*, United States Department of Agriculture.

[2] Wiest, *op. cit.*

VIII. Costs of marketing butter. — The range of cost margins, as shown by a number of studies made before the recent war, may be summarized as follows:[1]

	Per Cent of Price Paid by Consumer
Farmer's share including cost of hauling to creamery	69.4 to 75.9
Total margin of creamery	6.7 to 7.9
Freight and cartage from creamery to wholesale receiver	1.8 to 4.2
Combined margin of wholesale receiver, jobber, and broker	4.3 to 5.6
Storage	0.5
Shrinkage	0.7
Putting tub butter in packages	2.9
Gross margin of retailer	9.9 to 15.3

It should be noted that the per cent of the consumers' price received by each of the several middlemen represents the gross margin and not the net profit of the middleman. Out of the gross margin must come all expenses of operation.

IX. Market classes and grades. — The principal classes of butter recognized in the trade are substantially as follows:

1. Creamery
2. Dairy (butter made on a farm)
3. Packing stock (butter suitable for making Process or Ladled butter)
4. Process (butter which has been melted, clarified, and rechurned with cream or milk)
5. Ladles (butter collected in rolls, lumps, or in whole packages, and reworked by the dealer)
6. Grease (butter unfit for human consumption)

[1] This summary is based on the following studies: Weld's "The Marketing of Farm Products," pp. 190–192; "Butter from Producer to Consumer," *Bulletin 164*, Bureau of Labor Statistics, p. 11; Hibbard, B. H., and Hobson, Asher, "The Marketing of Wisconsin Butter," *Bulletin 270*, Wisconsin Agricultural Experiment Station.

7. Known marks (butter designated by a trade-mark registered on the exchange. It may consist of creamery, process, or ladles but usually must be the highest grade of its kind).

The common faults in butter have been enumerated as follows: (1) soft, leaky, open body; (2) incorrect quantity of salt; (3) imperfect color; (4) metallic flavors; (5) acid, unclean, and old-cream flavors; (6) streaks and mottles; (7) mold on butter and dirty packages. The various characteristics are given the following weights in grading: flavor, 45; body, 25; color, 15; salt, 10; condition of package, 5.

The method of grading butter varies slightly in different markets. In New York the grades are as follows:

Specials	(grading 95 points or better)
Extras	(" 91 to 94, inclusive)
Firsts	(" four points below Extras)
Seconds	(" five " " Firsts)
Thirds	(" seven " " Seconds)

X. Market News Service. — The Market News Service of the Bureau of Agricultural Economics, United States Department of Agriculture, issues a daily summary of market conditions for butter and cheese in five of the leading markets, a weekly market review for butter and for cheese, a monthly report of milk prices, and a quarterly dairy production report.

QUESTIONS ON THE TEXT

1. Contrast briefly the characteristics of the marketing arrangements for milk and butter with the marketing arrangements for cotton.
2. Why does the price for market milk tend to be higher than the price paid for milk by condenseries, creameries, and cheese factories?
3. To what extent is market milk sold direct by the producer to the consumer?
4. Describe the functions and operation of milk collecting stations.
5. What are the causes of the tendency toward concentration in the distribution of milk in large cities?

6. What advantages do large distributors have in the distribution of milk at retail?

7. In view of the advantages enjoyed by the large dealer, how does the small distributor still continue to distribute milk and even undersell the large dealer?

8. What are the principal classes of milk?

9. To what extent is milk bought or sold according to quality, and what methods of buying by quality are employed?

10. Discuss the elements of cost in the marketing of milk.

11. Describe the various types of coöperative organizations for marketing milk.

12. To what extent and in what ways can the farmer benefit by collective bargaining in the sale of milk?

13. What is the function of the centralizer?

14. Describe the various ways in which butter is marketed locally.

15. What are the functions of the wholesale receiver in the marketing of butter? What are the functions of the jobber?

16. Discuss the storage of butter.

17. Describe the various methods of determining butter prices in wholesale markets.

18. What percentages of the consumer's price of butter are represented by the various elements of cost of marketing as shown by the figures in the text?

19. Give the principal classes and grades of butter.

SPECIAL PROBLEMS

1. Write an account of the regulations governing the sale of milk in some large city.

2. Write a description of the organization and methods of operation of one of the large associations of milk producers (*e.g.* Chicago, New York, etc.).

3. Estimate the various items of cost in operating a retail milk route.

4. From some large daily paper or trade journal copy the price quotations and other trade news concerning butter, and explain the terms used.

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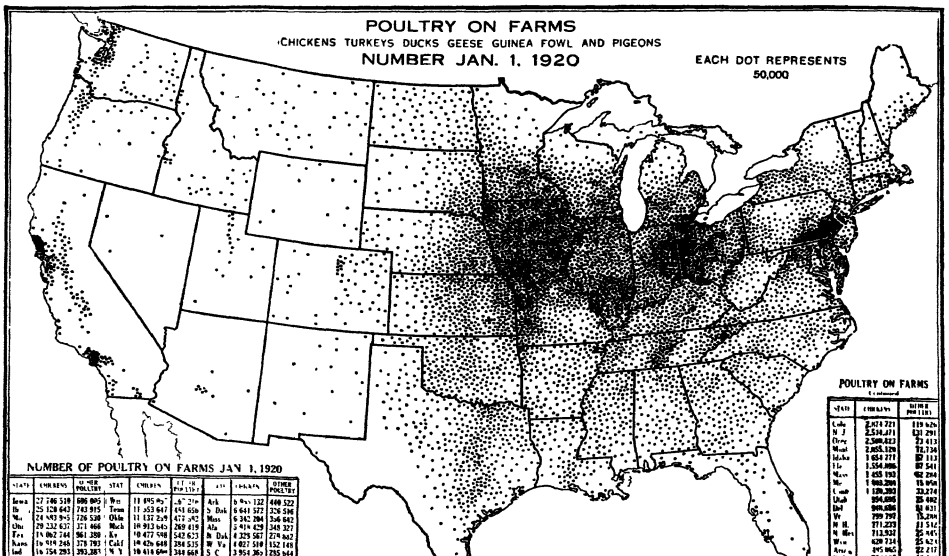
CHAPTER XXI

MARKETING PROCESSES — EGGS

I. Conditions of production
II. General outline of methods of marketing poultry and eggs
III. Wholesale egg markets
IV. Seasonal variations in supply and price; cold storage
V. Costs of marketing eggs
VI. Coöperative marketing of eggs
VII. Market News Service

I. Conditions of production. — Generally speaking, in the North Central States and in the South poultry is kept on the farm as a side line. Hens, chickens, geese, turkeys, etc. are left to shift for themselves, consuming the waste products of the farm. Such care as they receive is given largely by the women and children. In other sections of the country there is a greater tendency toward specialization in poultry production.

By far the largest part of the poultry and eggs of the United States is consumed in the general region where it is produced and much of it in the vicinity of the place of production. However, the fact that New England and the Middle Atlantic States, with about a third of the population of the United States in 1920, contained only nine per cent of the poultry makes it necessary for those regions to import large quantities of poultry and eggs from the Middle West and South. In all parts of the United States the rapid growth of cities is making necessary the collection of poultry and eggs from a wider area and a more elaborate organization for marketing.



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FIG. 70. — NUMBER AND DISTRIBUTION OF FARM POULTRY, 1920

Half of the poultry in the United States is in the Corn Belt and around its margin where feed is cheap, but there are several other important centers of production.

II. General outline of methods of marketing poultry and eggs. — The marketing arrangements for poultry and eggs comprise a mixture of the old simple and local arrangements and practices, and the elaborate, centralized, systematic arrangements which have been more recently developed to provide for the wants of consumers in cities and other deficit areas.

The methods of marketing for local consumption require but brief description. Poultry, usually undressed, and eggs are brought by the farmer to the small town or city and sold to regular customers, peddled from house to house, or sold to grocery stores, restaurants, or hotels, which in turn retail them to their customers. Many farmers follow the practice of shipment to customers by means of parcel post or express.

The arrangements for long-distance marketing are for the most part the same for both poultry and eggs. Locally, both products were formerly bought largely by country stores which shipped the surplus to wholesalers or commission men in the city. However, in localities where supply is large enough to make specialized buying economical, local produce buyers who make a business of purchasing and shipping poultry and eggs largely supplant the country store in the performance of these functions. Sometimes the produce buyer is an independent; sometimes he is one of a line of local buyers representing a central produce house in a large city. Not infrequently the local firm sends traveling buyers through the country districts to purchase direct from the farmer.

In wholesale markets wholesale buyers and commission men are the principal marketing agencies. Sometimes, the same firm combines both kinds of business. The wholesaler has special facilities for grading, storing, packing, and shipping the product. The large wholesaler usually sends out daily price quotations to local buying houses. He sells to retailers, hotels, restaurants, hospitals, and other large buyers. Wholesalers located in surplus regions do a large business in shipping

in carload lots to large wholesale receivers in Eastern cities. In large cities a jobber intervenes between wholesaler and retailers.

In many parts of the country, eggs are sold by the case-count system — that is, there is no attempt to grade the eggs. Consequently the farmer is not offered any inducement for good quality. In some sections eggs are purchased by the loss-off method, the farmer being paid only for the good eggs. However, under this method there is no premium for extra high quality, as in Europe where eggs are carefully graded according to size, color, cleanliness, freshness, and infertility.

As a result of improper methods of production and marketing, the loss of eggs by spoilage is very great. In an extensive study by the United States Department of Agriculture it was found that approximately 9.4 per cent of the eggs marketed were rotten, 1.9 per cent were checks, — that is, chipped or cracked — 10.3 per cent were graded as seconds, and 78.3 per cent as firsts.[1]

III. Wholesale egg markets. — The seven leading egg markets of the United States and the number of cases of eggs received in each, in 1918, were as follows:[2]

Chicago	5,049,743	San Francisco	666,845
New York	5,026,548	Milwaukee	180,616
Boston	1,604,289	Cincinnati	176,733
St. Louis	934,668		
Total for seven markets			13,639,442

Nearly every city of considerable size in the United States is the location of wholesale dealers in eggs. Some of these dealers sell eggs on commission, but the greater part of the

[1] Lauman, H. M., "The Handling and Marketing of Eggs," *Yearbook* for 1911, United States Department of Agriculture. See also the estimates by Hastings, M. M., "The Egg Trade of the United States," *Circular 140*, Bureau of Animal Industry, United States Department of Agriculture.

[2] *Yearbook* for 1918, United States Department of Agriculture, p. 611.

trade now is carried on by direct purchase from the rural collecting agencies or from wholesale houses in smaller centers.

The arrangements for price determination are no better developed than those for determining the price of butter. The trading is almost entirely outside of the exchanges. In some markets quotations are determined by official committees; in others, by a representative trade journal.

IV. Seasonal variations in supply and price; cold storage. — The problem of equalizing the supply in relation to the demand of different seasons is much greater for eggs than for butter. The fresh supply of eggs is less evenly distributed throughout the year. Moreover, the interval between the period of greatest abundance of eggs (March and April) and the period when the greatest quantity is delivered from storage (November to January) is probably two months longer. It has been found that eggs stored in the hot months of July and August do not keep as well as those stored during the preceding April. The risk of storage is greatly increased by the fact that the season of large supply begins so soon after the period of greatest demand for storage eggs. If the spring opens early the market may receive heavy supplies of fresh eggs in February, and storage eggs may be worth much less than when put in storage.

Since fresh eggs differ greatly in quality from eggs long in storage, there is likely to be a much greater difference in price during the period of scarcity than occurs in the prices of fresh and storage butter. The demand for fresh eggs in winter is to supply the wants of hospitals, soda fountains, and wealthy people who are willing to pay high prices. For these reasons, the prices of storage eggs are much more stable throughout the year than are the prices of fresh eggs. The average prices received by farmers for fresh eggs in different months of the year are shown for a period of nine years in the following table:[1]

[1] Derived from the *Yearbook* for 1918, United States Department of Agriculture. The January price is an average of only eight years.

TABLE 22. AVERAGE PRICES OF EGGS ON THE FIRST OF EACH MONTH, 1909–1918

Month	Average Price	Month	Average Price
January	31.0	July	18.6
February	27.7	August	19.2
March	22.7	September	21.3
April	18.1	October	24.6
May	18.5	November	27.8
June	18.8	December	32.2

The table illustrates the risk involved in storing eggs, for the average price of eggs declined in each successive month from January to April. A more detailed study of prices for the several years shows that in one year the price was two cents lower in March than in the preceding April. In several other years, the price of fresh eggs in March exceeded the price in the preceding April by little more than the cost of storage, insurance, and interest.

V. Costs of marketing eggs. — The following analysis of the cost of marketing eggs published by the New York State Food Commission in its *Report* shows the costs per dozen on eggs shipped from outside the state to New York City.

It will be noted that in this analysis no distinction has been made between wholesale receiver and jobber, both being lumped together under the title of wholesaler. However, frequently both classes of middlemen appear in the marketing chain. A study of the marketing of eggs from an Iowa point to New York, published in 1909, showed a gross margin of one-half cent to the wholesale receiver and one and one-fourth cent to the jobber out of a total consumer's price of twenty-five cents.[1]

[1] Hastings, *op. cit.*, p. 23 (quoted by Weld, *Marketing of Farm Products*, p. 196).

It is clear that the retailer takes a large part of the total cost of marketing.

TABLE 23. ANALYSIS OF COSTS OF MARKETING EGGS FROM OUTSIDE THE STATE OF NEW YORK TO NEW YORK CITY

	Elements of Expense	Margins	Per Cent of Consumer's Price
Producer's price	$0.20	$0.20	63.9
Shipper's charges:			
(*a*) Labor in collecting and packing	0.005	——	——
(*b*) Cases, fillers, and packing . .	0.0073	——	——
(*c*) Transportation charges to city	0.0106	0.023	7.3
Commission for handling	0.01	0.01	3.2
Wholesaler's charges:			
(*a*) Cartage from dock to store . .	0.00133	——	——
(*b*) Candling and grading . . .	0.00666	——	——
(*c*) Storage and insurance . . .	0.016	——	——
(*d*) Jobber's profit and charges . .	0.01	——	——
(*e*) Delivery to the retailer . . .	0.004	0.038	12.1
Retailer's charges:			
(*a*) Operating expenses, 10% . .	0.0271	——	——
(*b*) Retailer's profit, 5%	0.01497	0.042	13.5
		$0.313	100.0

VI. Coöperative marketing of eggs. — The advantages of coöperation in marketing eggs consist: (1) in freeing the farmer from dependence on a local buyer who does not always pay all that market conditions justify; (2) in furnishing a convenient means of regular collection; (3) in providing a system of purchasing according to quality; (4) in establishing a standard of excellence for the output of the organization so that its goods command the top price in the markets. The last-mentioned advantage may be accomplished only by an organization which exercises rigid control over the methods of producing and handling eggs employed by its members.

A coöperative association, or egg circle, may cover an area within a radius of about five miles of the center of collection. Each member may deliver his own eggs or some regular delivery service can be provided, as in Denmark. The egg collection service may sometimes be combined with another kind of delivery service, such as the milk wagon or coöperative supply wagon.[1]

To be successful an egg circle must enforce rigid regulations governing quality. If each member packs his own eggs for shipment he should be given a rubber stamp, showing the brand of the circle and the recorded number of the member. Each egg must be stamped plainly on the big end. This makes it possible to trace responsibility for inferior eggs, and if a sufficient penalty is exacted for each offense, this method may be found quite effective. As an additional precaution it is probably desirable that the eggs be candled by the secretary or other official of the organization.

Each member should be given a receipt for the number of eggs of each grade. Eggs of the same grade may be pooled, and the farmer may share in receipts according to the quantity contributed. The Danish coöperative societies generally pay the members a little under the prevailing market price and distribute any surplus remaining at the end of the year, after setting aside a certain percentage for reserve.

When a large region produces a surplus of eggs which must be shipped a great distance, considerable advantage may be gained by the federation of local egg circles. The great Danish Commercial Egg Exporting Society may be regarded as a model for such an organization. By careful standardization of the quality of the supply this organization has established so great a reputation for Danish eggs in the English market that they command a substantial premium.

[1] On methods of organization see "The Community Egg Circle," *Farmers' Bulletin 656*, United States Department of Agriculture.

VII. Market News Service. — The Bureau of Agricultural Economics of the United States Department of Agriculture maintains a daily Market News Service for eggs and for poultry, showing market conditions in five principal cities.

QUESTIONS ON THE TEXT

1. Describe the general movement of eggs to market.
2. Describe the methods employed in buying eggs from the farmer.
3. Discuss the seasonal variations in the prices of eggs as related to the problem of storage.
4. What are the principal elements of cost of marketing eggs?
5. Describe a system of coöperative marketing of eggs.

SPECIAL PROBLEMS

1. Prepare a map showing the number of poultry in each American state.
2. Organize among the members of the class a coöperative egg circle, taking all necessary steps in organization and working out a detailed plan of operation.
3. Write an account of the Danish coöperative egg export association.
4. Write an essay describing in detail the United States Department of Agriculture's Market News Service for poultry and eggs.
5. Plot a curve showing the monthly changes in the prices of eggs and another curve showing the monthly changes in production. (See latest *Yearbook* of the United States Department of Agriculture.)
6. Prepare similar curves for monthly prices and production of eggs.

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(See also various texts and bulletins on poultry production.)

CHAPTER XXII

PROCESSES OF MARKETING — VEGETABLES AND FRUITS

I. General characteristics of the marketing of vegetables and fruits
II. Methods of sale by farmers
III. Shipment to market
IV. The wholesale market
V. Packing and grading
VI. Storage of vegetables and fruits
VII. Costs of marketing vegetables and fruits
VIII. Coöperative marketing of vegetables and fruits
IX. Market News Service

I. General characteristics of the marketing of vegetables and fruits. — This group of products as a whole is characterized by extreme lack of uniformity in methods of packing, shipping, and grading; by great variety of market methods and practices; by excessive variability of prices from time to time; and by lack of uniformity in the price levels prevailing at a given time in different markets, and even in the same market. For instance, in July, 1914, peaches sold in the New York wholesale market for from fifty cents to four dollars per bushel, and the same week cantaloupes sold at prices ranging from fifteen cents to three dollars and fifty cents per crate. On October 15, Arkansas farmers received on the average three dollars per hundredweight for cabbage, while New York farmers were able to get only forty-five cents.

These characteristics of the marketing of vegetables and fruits are largely due either to the perishability of the product or to the recent development of the industry — especially the production in regions distant from centers of consumption.

The number and variety of products in this group are so great that it is impossible to consider the marketing of each separately. We must confine our attention to the aspects of marketing common to all.

A considerable part of the production of vegetables and small fruits is still carried on in the immediate neighborhood of the market supplied. Near every large city there is a zone of production devoted to these products. Since, however, there is a large out-of-season demand and a large demand for products requiring special conditions of soil and climate, a great many specialized areas for the production of vegetables and fruits have developed in the United States.

II. Methods of sale by farmers. — An unusually large proportion of vegetables and fruits, as compared with other products, is still shipped on consignment to the wholesale market and sold on commission. The shipment may be made by individuals or by coöperative associations. The perishability of the product, the variability of prices, and the lack of standardization in methods of grading and packing make it both risky and difficult for the wholesaler to buy at point of shipment. However, in the case of potatoes and the less-perishable fruits, large wholesalers send out traveling buyers. When no cooperative associations exist, local dealers purchase the farmer's product, and pack, grade, and ship it to market. Canning factories buy large quantities of vegetables and fruits on contract with the grower by which the latter agrees at the beginning of the season to produce a certain quantity at a guaranteed price. In some fruit regions traveling buyers purchase the product of an entire orchard at a flat price. In truck-growing regions near cities a considerable part of the product is marketed direct by the grower, either by peddling or by sale in a public market or curb market to jobbers, retailers, and consumers.

III. Shipment to market. — Although many vegetables and fruits are shipped by express, it is usually important to ship

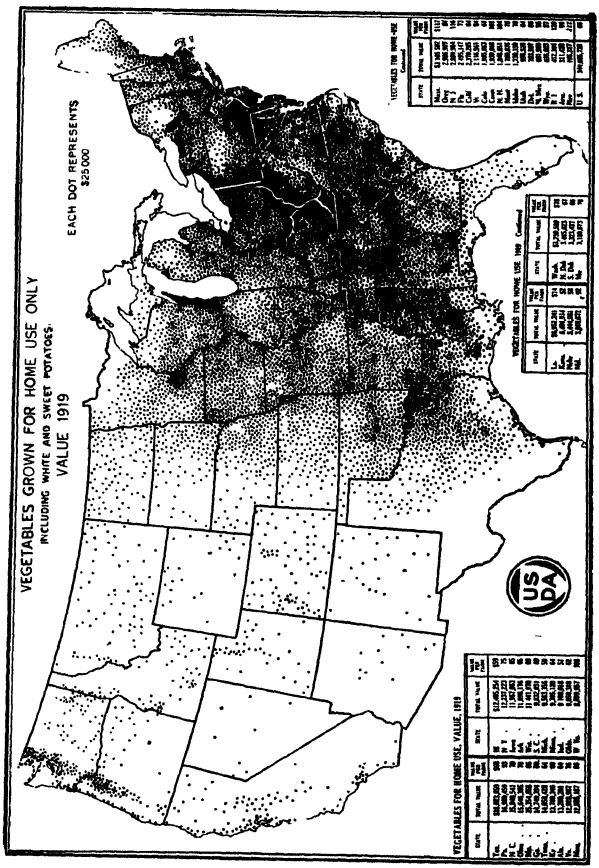


FIG. 71. — VALUE AND DISTRIBUTION OF VEGETABLES GROWN FOR HOME USE ONLY, 1919

Yearbook Separate 878, U. S. Dept. of Agr.

in carload lots, not only to economize in freight charges but also to take advantage of refrigerator service and to avoid delay. Some railroads operate a pick-up service.

In some sections of the lower Mississippi Valley where there are no coöperative associations to combine individual shipments, a special middleman, known as a "general consignee" combines individual shipments into carload lots and consigns the car to himself at the wholesale market. When the car arrives he consigns the individual shipments in the car to various commission men or others, according to the previous instructions of the shippers. The general consignee saves the difference in freight rates between carload lots and less than carload lots, dividing this saving with the shipper.

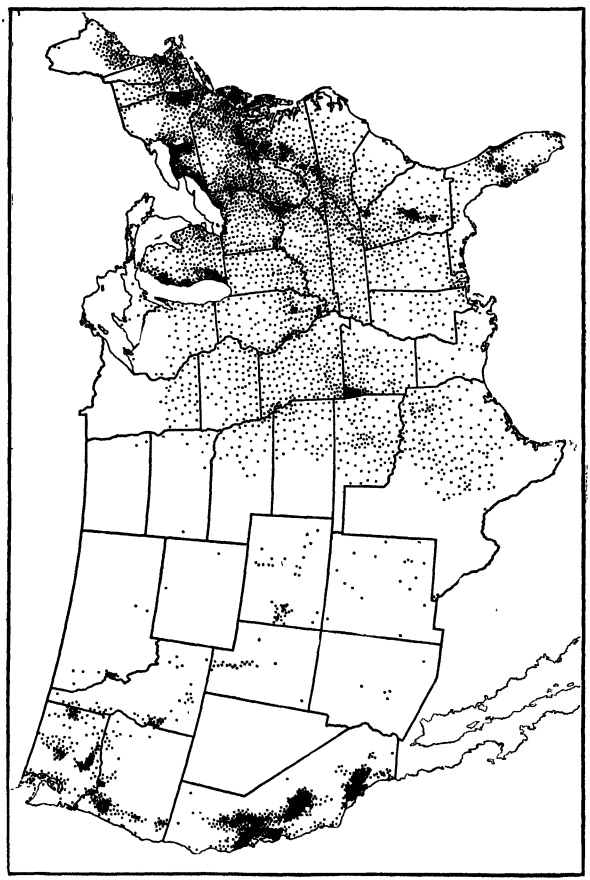
IV. The wholesale market. — Since vegetables and fruits are perishable, there is great danger that these products will be unequally distributed, so that certain markets will be glutted while others will be undersupplied. This difficulty has been partly overcome by the practice of diversion shipment by telegraph — that is, after the car is started on its journey the shipper or his representative directs by telegraph the point to which the car shall be shipped.

In order that this direction may be intelligently given, it is necessary that the shipper maintain agents in the different markets to supply the necessary information. This is accomplished in three different ways:

1. A large coöperative association may maintain its own agents in different cities.

2. Large wholesale dealers may maintain branch houses in different cities and in this way keep in touch with a number of markets.

3. A commission house may maintain agencies in different markets to obtain information and may enter into a contract with large shippers to divert cars of perishables to those markets where the conditions seem to be most favorable.



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FIG. 72. — FRUITS AND NUTS, 1920 (Approximate acreage)

Note the tendency toward the concentration of production in certain localities of comparatively small area.

Whether or not a city is a wholesale market for fruit or vegetables depends on whether the population of the city and its distributing territory is sufficient to consume a carload at a time. This consuming ability depends greatly on the kind of product. A recent study showed that the number of cities receiving carload shipments of different perishable products was as follows:[1]

Peaches	87	Lemons	39
Watermelons	86	Pears	32
Cantaloupes	77	Pineapples	28
Bananas	72	Plums	24
Strawberries	71	Cucumbers	19
Tomatoes	66	Celery	18
Oranges	65	Green beans	11
Grapes	53	Apricots	11
		Each of 25 other commodities from 1 to 10 carloads	

Because of the perishability of the products and the great risk involved, the commission man plays a greater part in the wholesale marketing of fruit and vegetables than in the case of other commodities. For the most part, the shipper bears the risk of shipment and sale in the wholesale market. When the goods arrive, they are usually sold privately by commission men or publicly at auction. Even when sold at auction the shipment is usually consigned to a commission man who looks after the transaction.

The auction method of selling is especially characteristic of the marketing of fruits and vegetables. In each of a large number of cities there are auction companies, which ordinarily sell shipments in the railway yards, for commissions varying from two to five per cent.

The auction method of sale has important advantages. The goods are sold in small lots amounting to a few boxes or hampers. Therefore, the buyers may consist not only of large whole-

[1] Andrews, F., *Annals of the American Academy*, November, 1913.

sale firms but also of small jobbers and even retailers and push-cart men. Each buyer can obtain the kind of goods demanded by his trade without having the trouble of finding a dealer who may have that particular quality for sale. As a consequence of these conditions the perishable product is quickly distributed.

Another type of middleman known as a broker plays an important part in the fruit and vegetable trade. Representing numerous specialized buyers or specialized sellers he brings buyer and seller together for a small commission amounting to from $5.00 to $20.00 per carload. (See page 458.)

The jobber performs important functions in the marketing of vegetables and fruits, buying relatively small quantities and distributing them to retailers, hotels, restaurants, and peddlers. Frequently, the jobber specializes in purchasing and selling particular classes and grades of products demanded by his trade. (See page 458.)

V. Packing and grading. — Markets differ greatly in their demands with respect not only to methods of packing but also with respect to preparation for market, size, and variety. These differences may extend even to minute details. Thus some markets demand the roots left on turnips, radishes, and onions; others that they be removed. Some markets require that the tops remain on turnips and onions, while other markets require the opposite. In some markets the demand for green-fleshed cantaloupes predominates, while in others there is a preference for orange-fleshed melons.

It is especially important that fruits and vegetables be carefully classified and graded before shipment. Uniformity in color, size, shape, and variety is essential to profitable sale. Not only will a few second-grade apples mixed with a shipment of first-grade greatly reduce the selling price, but also a few first-grade apples mixed with a shipment of second-grade may have the effect of making the shipment less valuable than if it were uniformly a second-grade shipment.

In some states legislation has been passed to effect standardization in grading, packing, and branding fruits and vegetables. There are also national laws defining grades and standardizing methods of packing apples, strawberries, Bermuda onions, potatoes, and other similar products.[1]

VI. Storage of vegetables and fruits. — Not only is it necessary to provide adequate storage facilities for fruits and vegetables in market centers, but it is also especially important to provide arrangements for storage on the farm. It has been estimated that from twenty to thirty per cent of perishable farm products as a class decay on the farm, in addition to the estimated twenty-five per cent which is hauled to the dump pile from the wholesale houses because unfit for consumption. Probably 100,000 carloads of fruits and vegetables annually rot on the ground on account of inability to ship immediately and lack of storage arrangements for holding them.[2]

Local storage is frequently provided by farmers' coöperative associations in potato regions. Local storage warehouses are owned by the farmers, while others are the property of dealers in the wholesale market. In all large cities a considerable amount of the cold storage warehouse space is devoted to the storing of vegetables and fruit.

VII. Costs of marketing vegetables and fruits. — On account of perishability, special expenses connected with packing

[1] The reader who is interested in the details of grading and packing for a particular product should write the Bureau of Agricultural Economics, Washington, D. C. He may also consult the authorities of his state agricultural college and experiment station or the director of markets in those states where such an office has been established.

[2] For information on methods of farm storage see "Home Storage of Vegetables," *Farmers' Bulletin 879*, United States Department of Agriculture; "Potato Storage and Storage Houses," *Farmers' Bulletin 847*, United States Department of Agriculture; "Farm Storage for Fruits and Vegetables," *Bulletin 58*, Department of Agriculture, Province of British Columbia.

and handling, and the extreme degree of risk due to variations in prices, the costs of marketing vegetables and fruits are greater than for any other large class of farm products. Since the costs and prices vary constantly, statements of the percentage of cost to consumers' price for the majority of vegetables and fruits must be taken as illustrative only.

One well-informed student of the subject estimates that but thirty-three to thirty-six per cent of the price paid by the consumer of this class of products finally reaches the producer.[1]

Investigations of the New York State Marketing Commission showed that the retailers' margins alone vary from 57.8 per cent of the wholesaler's cost in the case of Maine potatoes to 135.2 per cent of the wholesaler's cost in the case of bananas. It should be noted, however, that, if the latter is stated in terms of per cent of retailers' margins to consumers' prices, it becomes 57 instead of 135.2. A study of the marketing of a number of cars of cantaloupes in 1915 showed that the retailer retained 59.7 per cent of the price received by him, the jobber, 14.6 per cent of his selling price, and the wholesale receiver, about three per cent.[2] It is said that before coöperation was introduced in the marketing of California dried peaches the grower received only two and one-half cents out of the consumers' price of seventeen cents per pound.[3] Potatoes, being a less perishable product, are marketed at considerably lower cost. An investigation of the marketing of potatoes in 1914 showed that the farmer received about forty-eight per cent of the price paid by the consumer.[4]

[1] "A Successful Method of Marketing Vegetable Products," by L. C. Corbett, *Yearbook* for 1912, United States Department of Agriculture.

[2] "Cantaloupe Marketing in the Larger Cities," etc., *Bulletin 315*, United States Department of Agriculture.

[3] Plehn, C. C., "The State Market Commission of California," *American Economic Review*, VIII, March, 1918.

[4] "The Marketing of Wisconsin Potatoes," by H. C. Taylor, *Bulletin 256*, Wisconsin Agricultural Experiment Station.

Although the high costs of marketing fruits and vegetables are to a large extent due to the peculiar character of these products and the special difficulties in marketing them, there can be little doubt that considerable economies may be accomplished in the process of marketing. This is demonstrated by the economies effected by large coöperative fruit marketing associations.

VIII. Coöperative marketing of vegetables and fruits. — Comparatively little progress has been made in the development of coöperation in the producing areas which market their products in near-by cities largely by direct marketing — that is, by personal sale made by the producer in the market. It is difficult to effect coöperation because of the great variety of products and of methods of production. However, at present there is a great need for coöperative organization in such areas. The marketing of fruits and vegetables by the direct methods now employed is costly,[1] and is characterized by enormous risks. The producer must take whatever price is offered by the local market on the day of sale.

The serious difficulties in the marketing of fruits and vegetables from a distance have been responsible for the rapid development and elaborate organization of coöperative associations. Statistics obtained by the United States Bureau of Markets for the year 1915 showed that there were in the United States 871 associations for the marketing of fruit and produce, and that these associations carried on a total business of $153,981,350.[2]

Some of these organizations have developed a higher degree of centralization and are operating on a larger scale than may be found in the case of any other type of coöperative marketing

[1] See p. 429.

[2] "Coöperation in the United States during the Present Decade — a Preliminary Statement," Bureau of Agricultural Economics, 1923, United States Department of Agriculture.

in the United States. For instance, the business of the California Fruit Growers' Exchange amounted to $56,902,000 in 1921. The California Fruit Exchange had a volume of business amounting to $12,680,000 in 1921. The Florida Citrus Exchange made sales to the amount of $13,000,000 in the year 1921. The Mutual Orange Distributors made sales amounting to $10,000,000. A considerable number of other associations transact a volume of business amounting in each case to millions of dollars per year.

Some of these organizations specialize in a particular kind of fruit or vegetable. Instances of this are the Celery Growers' Association of Orange County, California, and the National Watermelon Growers' Association. On the other hand, some organizations, such as the Eastern Shore of Virginia Produce Exchange, market several kinds of vegetables or fruits.

The various coöperative organizations differ somewhat in their functions. However, nearly all of the following functions are likely to be performed by a well-developed organization:

1. Practically all coöperative organizations provide for standardizing the grading and packing of the product. Some organizations merely specify the standards required, inspecting the product before shipment; others supervise the grading and packing of their output with great care. Sometimes expert packers are sent to the grower's farm or orchard to prepare the fruit for market. In some organizations the produce is transported to a central packing house where the fruit is carefully packed under expert supervision. Some organizations go so far as to provide expert pickers or harvesters; and some even superintend the pruning of fruit trees.

2. The more successful coöperative marketing organizations for fruits and vegetables have developed special brands for their output, and some of them have spent large sums of money in advertising these brands.

3. One of the most important functions of coöperative or-

ganizations is the assembling of the products in carload lots, especially in the case of those products in which a daily shipment of a carload involves a very considerable output, as, for instance, strawberries, lettuce, and other small and highly perishable products.

4. Most of the organizations attend to the details of shipment, look after claims for damages and demurrage charges, investigate claims for spoilage, and in some cases undertake to carry on any law suits which may arise over shipments of products.

5. One of the most important functions, as already indicated, is the diversion of car-lot shipments by telegraph to the most favorable markets. This may be effected through representatives of the association residing in large cities, through commission correspondents, or by some firm which makes a special business of car-lot diversion, as described above.

6. Many coöperative organizations provide facilities for local storage of products before shipment, and a few maintain storage facilities in the larger cities where their products may be held until the time arrives for favorable sale.

7. Most of the associations superintend the sale of the product after it reaches the market. The smaller organizations find it necessary to ship on consignment to commission men or to sell to brokers in the larger cities. The larger organizations, — as the Virginia Fruit Growers' Association, the Northwestern Fruit Growers' Association, the California Fruit Growers' Exchange, and the Eastern Shore of Virginia Produce Exchange — maintain representatives in the larger cities who superintend the sale of the produce.

8. The general function of all organizations is to maintain adequate accounts of sales and proceeds of sales and expenses of shipment.

9. Some organizations supplement their services in selling produce by collecting statistics as to probable prices, supplies

in the markets, and other information which they furnish to their members.

10. A number of organizations operate canning factories to dispose of products otherwise wasted or products which do not come up to the grade requirements for regular shipment.

11. A considerable number of coöperative organizations have found it profitable to purchase supplies for their members, including boxes and containers, fertilizer, spray materials, and other necessary commodities.

IX. Market News Service. — As in the case of dairy products, the Bureau of Agricultural Economics of the United States Department of Agriculture maintains a Market News Service for fruits and vegetables. Daily telegraphic reports are issued from eighteen of the largest cities of the United States and from numerous temporary field stations in the producing areas.

QUESTIONS ON THE TEXT

1. What are the general characteristics of the marketing of vegetables and fruits as contrasted with the marketing of cotton?
2. Describe the methods of sale of vegetables and fruits by farmers.
3. By what methods are vegetables and fruits transported?
4. Describe the organization of the wholesale market for vegetables and fruits.
5. What are the special advantages of the auction system?
6. Show the importance of careful grading of vegetables and fruits.
7. Give some illustrations of the high cost of marketing vegetables and fruits, and explain why the cost is high as compared with the cost of marketing other kinds of farm products.
8. Discuss the need for coöperation in marketing vegetables and fruits.
9. Outline the various functions carried on by coöperative associations for marketing vegetables and fruits.

SPECIAL PROBLEMS

1. Sketch on a map, using pencils of different color for each product, the location of the principal regions of production for each of the following:

Irish potatoes, peaches, tomatoes, sweet corn, green peas, watermelons, cantaloupes, onions, apples, grapes, citrus fruits.

2. If there is some important kind of fruit or vegetable produced for market in your community, trace the important marketing steps from producer to consumer.

3. Describe in detail the organization and method of operation of one important coöperative association for the marketing of vegetables and fruits.

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CHAPTER XXIII

GENERAL ASPECTS OF MARKETING AND MARKET ORGANIZATION

I. General character of marketing processes
II. Productive functions of marketing
III. Characteristics of a highly developed system of marketing
IV. Conditions which affect the degree of progress in the development of marketing arrangements
V. Costs of marketing and conditions determining costs
VI. Direct marketing
VII. Marketing stages and agencies
  1. The principal stages in marketing farm products
  2. Marketing agencies and methods of buying farm products in the first stage, the producer's local market
  3. Marketing agencies of the wholesale market
    a. Commission men
    b. Wholesale receivers
    c. Shippers
    d. Scalpers
    e. Brokers
    f. General consignees
    g. Jobbers
    h. Storage agencies
    i. Produce exchanges
    j. Exporters
    k. Municipal public markets
    l. Retailers
VIII. Methods of increasing the efficiency of marketing arrangements

I. General character of marketing processes. — The concrete description of marketing processes in previous chapters has prepared us for considering the general significance of these

processes and for viewing marketing problems in their broader aspects.

II. **Productive functions of marketing.** — The first step in comprehending the problems of marketing is to analyze the functions that must be performed in carrying the product from producer to consumer. These functions may be outlined as follows:

1. Consolidation of local products into carload lots
2. Furnishing temporary storage until time of shipment
3. Sorting, grading, and packing. These functions may be performed by the grower, by local middlemen at the point of shipment, or by wholesale receivers and jobbers in the principal market centers.
4. Transport to market and preservation during transport
5. Storage in seasons of abundance in order to make provision for later seasons of scarcity
6. Direction of the product to the most advantageous market

This is probably the most significant and characteristic of the marketing functions. If we analyze this function we find that it usually involves a series of stages as follows:

a. Assembling of products in a local shipping point in the region of production

b. Concentration of goods from many such centers into large wholesale markets

c. Movement of the product from the large wholesale market in the producing region to other large wholesale markets in consuming regions

d. Distribution of the product to retailers, sometimes with the intervention of a jobber

e. Distribution by retailers to consumers

This function of directing goods to the most advantageous markets involves special knowledge and experience, as follows:

a. Expert knowledge of regions of production including quantity and qualities produced in different regions

b. Thorough acquaintance with methods and costs of shipment, including the various legal requirements prevailing in different states

c. A knowledge of the firms and agencies engaged in buying and selling, including familiarity with their reliability and credit standing

d. Knowledge of the tastes of consumers in different regions

7. Systematic collection and distribution of information concerning production, supplies, shipments, sales, and prices

8. The skillful anticipation of the wants of consumers

9. Furnishing the credit necessary to finance the movement of commodities from producer to consumer

10. Insurance against loss of the produce by fire and other damages

11. Establishment of representative market prices

12. Certain services which may be considered as performed especially by retailers, but some of which are performed also by other classes of middlemen, as follows:

a. Selling to purchasers at times convenient for their needs

b. Sale in convenient quantities

c. Permitting purchasers to inspect goods purchased for the purpose of obtaining greater satisfaction in fit, size, and quality

d. Giving the purchaser the benefit of the special knowledge of the seller with respect to qualities and characteristics of the product. Sometimes a reliable retailer renders important service to consumers in this way. Sometimes quality is designated by special brands and trade-marks

e. Supplying goods to consumers on credit

f. Provision of clean and attractive surroundings for the purchase of goods. This service may be carried to an absurd extreme involving unnecessary extravagance for which the purchaser must finally pay

III. Characteristics of a highly developed system of marketing. — It has already been pointed out in previous chapters that the marketing arrangements for some products are more highly developed than those for other products, and that even for the same product the marketing facilities in one region of the country may be more highly developed than in other regions.

The first question to be determined is what are the characteristics of a well-developed marketing system? The characteristics may be outlined as follows:

1. Economy in cost. The marketing process should be carried on at a cost as low as possible consistent with service.

2. Readiness of sale. One does not have to spend much time and exertion in finding a buyer for wheat. Contrast this condition of a continuous market with the market for land.

3. Steadiness of price. By this is meant freedom from extreme fluctuations.

4. Adequacy of competition. It is important to the sellers of produce as well as to the buyers that there be free competition and an absence of any element of monopoly in determining prices.

5. Promptness of payment to the producer. Generally speaking, producers are not in a position to wait for their money but desire payment at time of sale.

6. Facilities for preventing the deterioration of the product in its movement from producer to consumer.

7. Payment according to quality. Not only does buying by grade enable buyers to purchase intelligently and without having to engage in minute inspection of the product, but it also encourages producers to improve the quality of their products.

8. Regional uniformity of price. The more highly developed are the marketing arrangements the more the level of prices will tend to be uniform at a given time throughout con-

siderable areas. (See p. 477.) This uniformity of price at a given time is obviously a reflection of the fact that the product has been uniformly distributed in relation to demand in different parts of the territory.

9. Market information. It is very clear that the uniform distribution of products and the resulting uniformity of price in different regions is dependent upon arrangements that provide the fullest possible knowledge to all parties engaged in buying and selling concerning production, supplies on hand, demand, and prices. This information, for instance, is very much more complete for grain than for poultry.

10. Standardization in methods of packing, shipment, units of sale, and marketing charges. If different producers in the same district ship in containers of different shapes and sizes, if various middlemen quote prices on different units of the product, if there is no uniformity in shipping practices, and if costs of marketing are varying continually, no one knows what to depend on, and the result is confusion and inefficiency.

IV. Conditions which affect the degree of progress in the development of marketing arrangements. — The following conditions determine the degree of progress made toward achieving efficiency in these various respects:

1. Perishability greatly increases the difficulty, as well as the cost, of efficient marketing.

2. Some products are much more easily reduced to uniform classes and grades than others. For instance, live stock cannot be so easily classified and graded as wheat and cotton or even apples and potatoes.

3. The demand for some products is very much more fluctuating and elastic than the demand for other products. Compare, for instance, the demand for turkeys with the demand for beef, or the demand for fancy nuts with the demand for sugar. Variability in demand greatly complicates the problem of marketing.

4. Steadiness and abundance of supply in the producing region is an important condition in the development of adequate marketing arrangements within that region. The establishment of efficient local arrangements for marketing will be more costly in a region where the production of a commodity fluctuates greatly or where only a small supply is produced than in a region where the commodity is regularly produced in large quantities. For instance, in portions of the Cotton Belt, eggs and poultry are produced in such small quantities that adequate marketing facilities would be very costly for so small a volume of supply.

V. Costs of marketing and conditions determining costs. — Persons who attack the existing arrangements for the marketing of farm products sometimes give the total spread between producer's price and consumer's price and assume that the magnitude of this spread is an indication that the cost of marketing is extreme and that this extreme cost is due either to the existence of unnecessary middlemen or to the taking of abnormal profits by those engaged in the business of marketing. Many fallacies are traceable to this method of approaching the subject of marketing. It is obvious that the marketing of some commodities must necessarily cost much more than the marketing of other commodities. Moreover, it is very clear that it is inaccurate to compare the cost of marketing a commodity which has been manufactured before reaching the stage of consumption and the cost of marketing a commodity which does not undergo manufacture. In short, in comparing marketing costs it is very important to consider the functions to be performed and the services to be rendered.

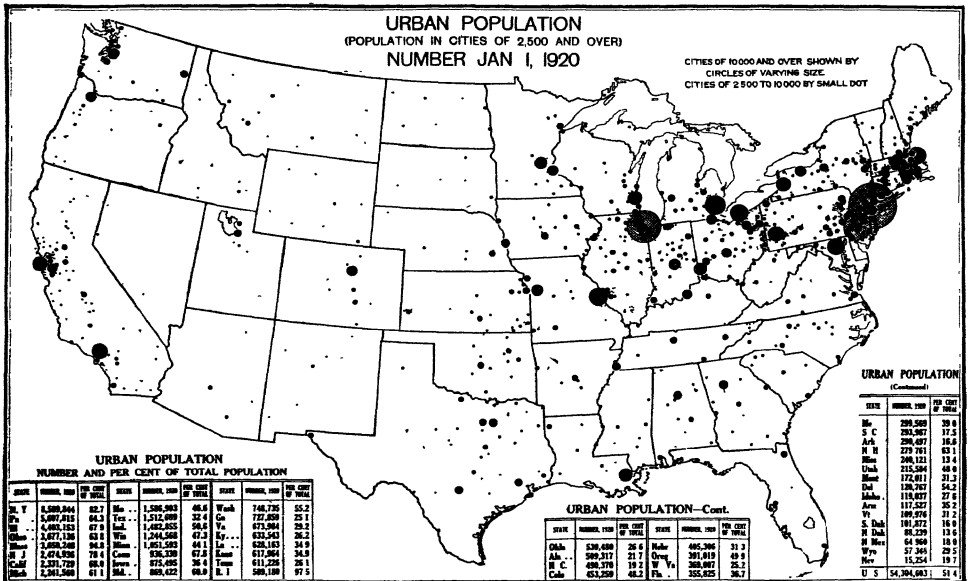
Certain conditions are tending to increase marketing costs. One of the most important of these conditions is the demand of consumers for special services, such as the increasing demand for package goods; the tendency to use the telephone and to demand prompt delivery service for small quantities of goods;

the tendency to purchase goods on credit; the increasing demand for fruits and vegetables out of season, necessitating storage for long periods of time; the demands for higher standards with respect to sanitary conditions in stores and for attractive surroundings in which to purchase goods; and the increasing demand for goods of the highest quality, necessitating the sale of the poorer grades at a sacrifice and a consequent addition to the cost of the better grades. Again, the growth of cities has made it necessary to produce commodities at greater and greater distances, increasing the cost of transportation for city populations.

In short, it should not be assumed that the cost of marketing a particular commodity is not justified merely because the cost is a large proportion of the consumers' price. Neither should it be assumed that the price at which goods sell is always to be explained in terms of cost of marketing. There are many conditions which cause price temporarily to depart from cost, sometimes being above the cost and sometimes below the cost of production and marketing. (See p. 477.)

VI. Direct Marketing. — There has been a tendency to assume that direct marketing is the cure-all for the various defects, real and imaginary, attributed to marketing processes. While under certain conditions direct marketing is practicable, it has important limitations. Several years ago it was estimated that of the agricultural products of the United States, exclusive of animal products, only 9.4 per cent[1] was to any extent adapted to parcel post or express shipment direct to consumers. For instance, this method of marketing is practically out of the question for such products as cereals, hay and forage, tobacco, cotton, sugar crops, potatoes, and minor field crops. With the exception of occasional shipments of hams, sausage, and bacon from farmers to city customers, practically all of the

[1] Hibbard, B. H., and Hobson, Asher, "Marketing by Parcel Post and Express," *American Economic Review*, VI, No. 3, p. 591.



Yearbook Separate 878, U S Dept of Agr.

FIG. 73. — NUMBER AND DISTRIBUTION OF URBAN POPULATION, 1920

The concentration of population in cities during the past few decades has greatly intensified the problems of marketing farm products.

meat products and by-products of slaughterhouses are necessarily distributed through the regular channels of trade rather than by direct marketing. Part of the considerable quantities of butter, eggs, and fowls still sold by farmers to consumers in near-by towns and cities are adapted to direct marketing by parcel post and express. It is obvious, however, that since the large consuming areas of the Eastern States and the South are dependent for their supplies on the products of the Middle West, the distance is so great that it largely prevents the use of these methods of transportation even if we do not consider the fundamental difficulties of exchange between producers and consumers so widely separated.

A number of elaborate schemes have been suggested for greatly extending the use of the parcel post and express as a means of direct marketing of farm products, and some of them have been brought to the attention of Congress. However, these plans usually fail to meet the difficulties in greatly extending these methods of marketing. These difficulties may be summarized as follows:

1. The cost of shipment is likely to become prohibitive for distances above two hundred miles.

2. Even for shorter distances the cost of shipment is likely to be too great for products of low value in proportion to weight.

3. It is difficult for producers to get in communication with those who desire goods, and vice versa. Attempts have been made by the express companies and by the Post Office Department to overcome this difficulty by the publication of lists of producers and consumers. However, even when the consumer knows what producers have products to sell, he is still unaware of the quality and quantity of the products available. Moreover, the producer may have sold the goods before he receives the order of a particular consumer.

4. When prices are changing rapidly, it is difficult for the pro-

ducer to quote prices that he can guarantee over a considerable period of time.

5. When claims are to be made for spoilage or unsatisfactory quality, it is troublesome to adjust the differences between the two parties by correspondence.

6. When small quantities of goods are sold by these methods, the costs of packing and addressing products and carrying on the necessary correspondence are not likely to be fully considered. If a farmer had to sell thousands of dollars worth of products in small units to numerous consumers, he would probably have to employ one or more stenographers and clerks to carry on the extensive correspondence involved, as well as other helpers to prepare the goods for shipment.

7. In marketing large quantities of products by parcel post or express, the fundamental difficulty is in equalizing supply and demand. Since the trade of farmers in a particular region is necessarily local, it is entirely possible that consumers in that region might find the supply entirely insufficient in periods when production is low, while, on the other hand, the demand of local consumers might be insufficient to absorb the entire supply at other times. Of course, this difficulty is not serious when direct marketing is supplemented by other marketing arrangements.

While the marketing of farm products by parcel post and express will not supersede the existing marketing arrangements, it is possible to employ these agencies to some extent with advantage. This is especially true when farmers have products of unusually high quality.

VII. Marketing stages and agencies.

1. *The principal stages in marketing farm products.* — We may divide the marketing of farm products into four main stages, within each of which marketing processes are carried on by various kinds of agencies. The four stages are as follows:

a. The assembling of products in a local market in the region of production

b. The concentration of products from many local markets, as well as from individual producers and shippers, in central markets located in large cities in or near the general region of production

c. The shipment of at least a portion of the products to large wholesale centers in consuming regions

d. The distribution of the products among smaller local centers where they are finally distributed among consumers

There are, of course, exceptions to the above outline, some of which were noted in preceding chapters. However, by far the larger part of farm products pass through these four stages.

2. *Marketing agencies and methods of buying farm products in the first stage, the producers' local market.* — In the first stage we may classify the methods of selling products by producers as follows:

a. Sale direct to consumers or to associations of consumers

(1) By delivery to regular customers

(2) By huckstering

(3) By shipment by parcel post or express to individuals or coöperative consumers' associations

b. Sale to local retailers, to hotels, restaurants, hospitals, etc. for local consumption

c. Sale direct to grocers or retail establishments

d. Sale to local manufacturers (flour mills, beet-sugar factories, canneries, etc.)

e. Sale to the following classes of local buyers for shipment to wholesale markets:

(1) Individual produce buyers, some of whom travel through the country in order to purchase farmers' products, while others operate permanent establishments to which farmers can bring their produce for sale.

(2) Traveling buyers representing large wholesale receivers or other central market buyers who go from locality to locality soliciting business. Sometimes, these buyers purchase direct from farmers, as in the case of live stock, especially in range districts. In other cases these buyers merely purchase from local establishments which, in turn, have purchased from the farmers.

(3) Local buying establishments which are owned by large central wholesalers operating a line or chain of such houses

(4) Retail merchants who purchase from the farmer partly for local consumption and partly for shipment to central market buyers

(5) Local commission men or brokers who buy on commission on the order of central market buyers, manufacturers, and other purchasers in the central market

3. *Marketing agencies of the wholesale market.*

a. Commission men. — The commission man is a middleman to whom goods are shipped on consignment with the understanding that he will sell them on commission, according to instructions of the shipper. The commission man is in possession of the goods and negotiates the sale on his own account; consequently he does not assume the relation of agent in dealing with the buyer but is in the same position as if he owned the goods which he is selling, and, therefore, the buyers do not have to inquire as to the limitations of the commission man's instructions. In this respect he is liable only to the consignor of the goods.

There have been many abuses of the commission business. Commission men have frequently taken advantage of their consignors by reporting shipments in bad condition, by failing to follow the instructions of the shipper in the sale of the goods, and by purchasing at low prices on their own account the goods which they have for sale, either openly or secretly and indirectly.

There has been such sharp competition among commission men for business that they have been inclined to cut the commissions charged consumers. This cutting of commissions is of great disadvantage to the honest commission man, for the dishonest commission man may make up the loss by his dishonest methods. In order to correct these abuses, produce exchanges in the central markets have developed regulations and provided for uniform commissions for sales by commission men.

b. Wholesale receivers. — These men assemble goods from many local markets in the central market by purchasing from local shippers or commission men. As already noted, wholesale receivers sometimes maintain their own buying agencies in producing markets.

The wholesale receiver performs a number of important functions, as follows:

(1) Establishes connections with local shippers

(2) Provides facilities for handling and storing products in large quantities

(3) Provides a broad market in which goods may be sold in practically any quantity and in which all qualities may be disposed of

(4) Frequently grades, repacks, and brands products

(5) Establishes connections with the retail trade or with jobbers in consuming centers

(6) Superintends the process of shipment from the local market to the central market and from the central market to the consuming center

(7) Furnishes the jobbers and retailers with small quantities of products of the grade and quality desired, at short notice

(8) Finances shippers by allowing them to draw on him for funds and finances retailers by granting them long credits on goods sold to them

(9) Regulates the distribution of commodities by means of

his expert knowledge of general conditions of supply and demand

(10) Regulates the consumption of commodities at different times by storing goods in periods of abundance for consumption in periods of scarcity

A number of conditions have led to an increase in the tendency for wholesale receivers to buy direct from local producers or shippers rather than through the commission man. These conditions may be summarized as follows:

(1) The method of outright sale is more satisfactory to the farmer who prefers to sell his products himself at a definite price rather than to intrust them to a commission man.

(2) There is a tendency for commission men to purchase outright as a method of cutting commissions fixed by regulation.

(3) It is frequently desirable to grade, standardize, and pack the product at the local market before shipment.

(4) Local prices are frequently out of line with prices in the central market, and the wholesale receiver may make considerable profits by buying at the lower prices in the local market and reselling on his own account in the central market.

(5) The improvement in facilities for communicating, such as the telegraph and telephone, the increased volume of local production, and the development of standard grades and uniform methods of packing and shipping in the local markets have removed many of the uncertainties and risks formerly incurred by the central market buyer in purchasing direct from the local shipper.

c. Shippers. — A third type of middleman is the shipper. His function is to specialize in buying in one market for shipment to another market, with the result that he tends to equalize prices between different cities.

d. Scalpers. — A scalper is a middleman who takes advantage of small differences of price between different middlemen in the same market. For instance, the prices offered by one

wholesaler may be slightly less than those offered by another. The effect of the scalper's activity is to do away with small differences prevailing in the same market and to make the prices more uniform throughout the market at a given time.

e. Brokers. — The broker is an agent who buys or sells for his principal in return for a small commission on the purchases or sales. He differs from the commission man in that while both sell on a commission the broker is only an agent of his principal while the commission man is in possession of the goods and sells them as if they belonged to him. For the most part, brokers buy and sell in very large quantities, and their rates of commissions are very low, for instance, from five to ten dollars per car of potatoes, five cents per box of oranges or lemons, one-fourth cent a pound for butter in carload lots.

f. General consignees. — The middleman known as the general consignee is active principally in the vegetable and small-fruits trade. His function has been explained in the discussion of the marketing of vegetables and fruits.

g. Jobbers. — The term "jobber," like the term "wholesaler," is very loosely used. Frequently it is popularly used interchangeably with the term "wholesaler." However, there is a tendency to employ the term "jobber" to designate a middleman who purchases from wholesale receivers and sells to retailers. Usually, he has a regular business with certain retailers, hotels, and restaurants, and, therefore, is not in a position to receive a very irregular supply of the product. Moreover, he may specialize in certain classes or grades of a product and also in the class of retailers with whom he deals. He acquaints himself with the credit conditions of his buyers and is prepared to deliver goods in small lots. Because of the smaller volume of his business the margin between his purchase price and his selling price on each unit of sale is usually somewhat larger than in the case of the wholesale receiver.

There seems to be a tendency for the distinction between wholesale receivers and jobbers to disappear through the tendency of the jobber to purchase direct from the primary sources of supply in order to buy more cheaply or through the tendency of wholesale receivers to eliminate the jobber by selling direct to retailers.[1]

h. Storage agencies. — We may distinguish between public warehouses and private warehouses. The former are under obligation to receive products offered for storage without discrimination in service or rates. Private warehouses are those owned by middlemen for their own use and do not involve the obligation to receive goods offered for storage by others.

Such evidence as is available seems to show that there is considerable competition between public warehouses for storage business not only within a city like New York but also between warehouses in different cities. Thus, the rates for storage in New York City depend somewhat on Chicago rates. Owing to the fact that public storage houses are open to any one who has products to store, there is little likelihood that they are a source of monopoly in the marketing of farm products.

Rates for storage are quite small per unit of products stored. In 1912 the storage charge in New York for six months was one cent a pound for butter, one cent a pound for poultry, about nine tenths of a cent per dozen for eggs, about six tenths of a cent per pound for cheese, and about three tenths of a cent per pound for dried fruit.

The general opposition to the hoarding of food products has led many people to believe that all products kept in storage are being hoarded. As a consequence of this idea, during the year 1919, in many cities the public insisted on the removal of eggs and butter from storage as a means of reducing the prices of these products. It has already been noted, however,

[1] Urner, F. G., "Wholesale City Distribution of Farm Produce," *Annals of the American Academy*, Vol. 50, p. 70.

that it is very important to store these products in the summer months in order to provide an adequate and uniform supply in the short seasons of production. Without question, a large portion of the products held in storage are kept for this purpose. The holding of food products from periods of abundance to periods of scarcity is a business involving considerable risk, with possible considerable speculative profits offset at other times by heavy losses.

i. Produce exchanges. — Produce exchanges are organizations of middlemen engaged in various kinds of transactions connected with the wholesale marketing of food products for the purpose of eliminating the abuses that result from unlimited and unregulated competition. The membership of such an exchange is likely to consist of a great many classes of business men. For instance, the membership of the New Orleans Cotton Exchange a few years ago included the following kinds of business men: commission merchants selling cotton for planters; exporters buying cotton for spinners and merchants in Europe; merchants buying cotton for spinners in the United States; exchange brokers purchasing bills of exchange drawn against cotton shipped to foreign countries; ship agents selling cargo space; insurance agents selling insurance on shipments of cotton; cotton brokers buying cotton on commission for manufacturers and other buyers; expert judges of cotton fiber who make a business of buying cotton of certain specified kinds from the planters for American and European spinners; and brokers specializing in buying and selling contracts for future delivery.

Some produce exchanges are devoted to the buying and selling of a single commodity, as, for instance, the New Orleans Cotton Exchange just mentioned. Other exchanges provide for the dealing in a number of different products, for instance, the Chicago Board of Trade, which lists grain, flour, provisions, hay, and dairy products.

It is the function of produce exchanges to regulate the conditions of trading and to provide suitable facilities for buying and selling. They formulate and administer numerous regulations with respect to methods of buying and selling, methods of delivering the goods sold, standardizing contracts of sale, defining standard grades and standard units of sale and delivery, and adjusting differences in prices of various grades. They provide for arbitration of disputes between members, inspection of products offered for sale, the regulation of weighing, and conditions of storage. Such institutions provide a convenient place where buyers and sellers may meet with all the conveniences necessary for the most efficient performance of their functions. Many produce exchanges are centers of a vast and complex arrangement for assembling information with regard to the products in which the members trade.[1]

j. Exporters. — Because of the special knowledge and methods required for exporting products to foreign countries, wholesale dealers engaged in the export trade may be considered in a class by themselves.

The exporting of farm products requires special knowledge and involves special risks. The exporter must be fully acquainted with prices in the home market and prices in the foreign market at every hour of the day. When he purchases goods for exportation he must take into account the cost of shipment. For the most part, the cost of cargo space in ocean vessels is not standardized like railway rates but is constantly varying with the supply of ships and the demand for cargo space. This introduces an element of great risk which the exporter endeavors to reduce by buying cargo space in advance of the time when it will be needed from persons who specialize in the buying and selling of future contracts for such space. Another element of great uncertainty is the variation in the rate of for-

[1] Methods employed in buying and selling in produce exchanges are further discussed in the next chapter.

eign exchange. When an exporter offers wheat to a foreign purchaser, he must take into account the rate at which he will be able to sell the bill of exchange which he will draw for the shipment. To some extent this risk is reduced by selling the bill of exchange in advance to speculators who specialize in the business of buying and selling foreign exchange on future contracts.

k. Municipal public markets. — The general experience has been that municipal public markets fall far short of fulfilling the expectations of their promoters. This is not so much due to the fact that the municipal public market does not fulfill a useful function but to the fact that too much has been expected of it.

As a matter of fact, municipal public markets have many limitations, as are shown by the large number of failures that have attended their establishment. An investigation of municipal markets in Europe some years ago showed that in Berlin twelve retail public markets out of fourteen had been abandoned, while in Paris only about half of the original thirty-three markets were still in operation. In New York City three such markets had recently been abandoned and three others were losing ventures, while several other markets had ceased to be retail markets and had become primarily employed for wholesaling. A summary of the experience with such markets in many American and Canadian cities showed that a number had failed, that a larger number were considered only fairly successful, while only in a few cities had a marked degree of success been achieved.[1]

In view of these facts, it is important to ask: What are the limitations of municipal public markets? These limitations may be summarized as follows:

(1) After such markets are established, the conditions of the

[1] The above information is largely taken from the report of the Mayor's Market Commission of New York City in 1913.

neighborhood are likely to change so that it is no longer a residence district.

(2) One of the most important reasons why such markets have not fulfilled the expectations of consumers is that they do not eliminate entirely other kinds of retail agencies. Consequently, the dealers occupying stalls in the city markets, as well as the farmers who sell from their wagons, do not find it necessary to sell at prices very much lower than those in adjoining grocery stores and meat shops.

(3) In some respects, dealers occupying stalls in the market do not have a great advantage over regular grocerymen and butchers in the cost of carrying on the business. The cost per unit of sale depends largely on the turnover — that is, on the rapidity with which the entire stock is sold. Many of these small-stall keepers do not have a rate of turnover as rapid as that of other retailers.

(4) In many cities it has been thought that the cost of retailing can be reduced by giving the stall keepers either free rent or very low rent. However, since the competition of grocers sets the standards of prices for the stall keepers the lower rents benefit the stall keeper rather than the consumer. It is said that in some of the New York markets Italians who have been fortunate enough to lease stalls at low prices have sublet these stalls to others at higher rents and have gone back to Italy to live off the income from the difference.

(5) Another important reason why municipal public markets do not realize the great expectations of those who promote them is that a large city can draw only a small part of its supply of produce from the farmers who live within driving distance of the city.

(6) Finally, it is quite possible to exaggerate the economy in direct sale by farmers at retail. It probably costs a farmer $12 to $15 for his time and the use of his team in driving to a market and remaining all day for the purpose of selling the load in

small quantities. Moreover, he must necessarily take the risk of not being able to dispose of the entire product and must then either sell it under unfavorable conditions prevailing at the close of the day or take it back home with him.

The enumeration of the above limitations should not convey the impression that a city market cannot perform useful functions as an agency for the marketing of farm products. In the smaller cities a considerable part of the supply of products may be furnished by farmers in the neighborhood. The market offers a place where consumers can buy fresh products. It furnishes a center to which farmers can go with a fair degree of certainty that they can effect a sale. The competition of the farmers may have some effect at times in preventing regular dealers from taking advantage of the public. Finally, such a market concentrates a considerable part of the retail activity in one center where municipal authorities can conveniently regulate and supervise sanitary conditions.

The conditions which are likely to favor a reasonable degree of success and public service on the part of municipal markets may be summarized as follows:

(1) It is probably unwise to expend large amounts of money in building magnificent structures of a permanent character, for the community may in time become unsuitable as a location for a retail public market.

(2) Since public markets are likely to be patronized mostly by the poor or middle classes, and especially by foreigners, they should be located conveniently for the trade of these classes.

(3) There is a difference of opinion as to whether cities should provide large retail public markets centrally located or whether they should provide smaller neighborhood markets. A combination of both systems may be desirable.

(4) The success of public markets depends very much on the method of administration. Unfortunately, in many cities the market master is a small politician who has little market

experience and whose functions do not extend beyond being a sort of head janitor.

(5) The influence of grocerymen and other dealers has frequently resulted in the provision that telephone delivery service shall not be permitted in public markets. The absence of the telephone and delivery service considerably limit the usefulness of the public market. Many bulky goods, such as potatoes, cannot be conveniently carried in considerable quantities by customers.

(6) It is best to operate a market system at cost — that is, a city should make no profit out of the marketing system.

(7) It is important not to grant long and unconditional tenure of stalls, for this may result in the subletting of stalls at a profit, as described above.

l. Retailers. — The outlines of costs of marketing different farm products in preceding chapters showed that the cost of retailing is a large part of the total. The share of the consumers' price received by retailers varies from about ten per cent for such articles as sugar and flour to fifty per cent or more in the case of some of the more perishable kinds of products.

The high charges for retailing of farm products are for the most part not due to the large profits made by retailers. Ordinarily, the small grocery is not an especially profitable enterprise, and, indeed, there is a very large percentage of failures among such stores. A study of retail stores in a certain city showed that for a period of twenty-two years the average number was one hundred and sixty-two. To maintain this average, five hundred and twenty-six people embarked in the business, three hundred and fifty-four of whom dropped out during the period. Of the number who discontinued business, apparently not more than twenty quit because they had made a satisfactory success.[1]

No doubt the high cost of retailing is due in part to the in-

[1] Nystrom, Paul H., *The Economics of Retailing* (N. Y., 1915), Ch. 17.

efficiency of some retail grocerymen and butchers. Many people who have insufficient experience enter the business because they desire to enjoy the distinction of being merchants and because little capital is required. However, the high cost of retailing is largely due to the character of the service provided, and this service is largely the result of special demands of consumers. Among these may be mentioned delivery service in small quantities at short notice, a demand for more sanitary conditions, buying on credit, demand for package goods, the right to return undesirable goods, and the use of trading stamps.

In the last few years several new kinds of agencies for retailing food have developed. Among these may be mentioned the development of chain stores, cash-and-carry stores, help-yourself stores, and large private markets. However, careful studies indicate that these agencies will not be able to displace entirely the small neighborhood store which renders services of the character described above to consumers who are willing to pay for these services.

An important retail agency is the pushcart man or huckster. While the pushcart man should pay a proper tax or license fee in order that regular dealers paying taxes and often heavy ones may not be subjected to unfair competition, we must object when the influence of retail grocers and other merchants induces cities to place a prohibitive tax or license upon this class of retailers. Such a policy is a very mistaken one, for the huckster or pushcart man distributes food at a very low cost. A pushcart may be rented for about ten cents a day. There is no expense for telephone, and delivery is made to the purchaser at the time of sale. The principal expense is the wage of the merchant, which is likely to be low. Moreover, the pushcart man sells out his total stock daily and may even sell more than one load a day, whereas the turnover of the average grocery store has been estimated at from ten to twelve times a year. The pushcart man does not wait for people to come to

him but goes where he can find business. He can sell the cheaper qualities of fish, meat, vegetables, and fruit that the average grocery store could not afford to keep in stock and can work into the channels of consumption goods that would soon perish if kept on the shelves of grocery stores. Consequently, the pushcart man renders a great service to the very poor classes of the city and prevents the waste of a large volume of produce.

The principal disadvantage from the public standpoint is that frequently pushcart men do not employ sanitary methods, and since they are so numerous, it is difficult to regulate them. However, this may be done by proper administrative arrangements, and a legitimate license fee is helpful as a means of control.

VIII. Methods of increasing the efficiency of marketing arrangements. — We should not close our study of marketing without attempting to summarize the methods of improving the efficiency of marketing processes. At the outset it should be clear that the real conflict of interest between producer and middleman on the one hand and the consumer and middleman on the other is not a conflict over the efficiency of marketing or over the cost of marketing, for it is to the interest of the middleman to increase his efficiency, but rather over the profits made by the middleman in rendering the service. Consequently, the difference of interest between the middleman and other classes is mainly a difference over price to be charged.[1]

In considering the broad question of how the system of marketing can be improved, it is necessary first to dispose of several plausible fallacies. The first of these fallacies is that marketing is not production and that consequently those who are engaged in carrying on the marketing process are merely economic parasites. It should be clear from our previous study that

[1] For a fuller elaboration of this point see H. C. Taylor, *Agricultural Economics* (New York, 1920), p. 360.

middlemen are performing certain essential services in distributing commodities among consumers.

A second fallacy is the belief that the more indirect stages of marketing are more expensive than the direct methods. This fallacy takes the form of the idea that the greater the number of kinds of middlemen engaged in marketing, the greater the cost of marketing will be. A good illustration of this fallacy is contained in the following statement: "A long line of commission men, produce merchants, jobbers, hucksters, retailers, and what-nots, simply passing goods from hand to hand like a bucket brigade at a fire is not only inefficient and wasteful, but very costly. In these days a hydrant and a line of hose are wanted." [1]

A little thought will show that the difficulty is in the confusion of the number of kinds of middlemen with the number of middlemen. It is quite possible to increase the number of kinds of middlemen while decreasing the total number of middlemen. In fact, we should think of the marketing process as a process involving specialization of functions. When different classes of middlemen specialize in performing different functions, there may occur an economy in the work of marketing. To reduce the number of kinds of middlemen and to have one single class of middlemen performing all the functions of marketing would not necessarily reduce the cost nor even the number of middlemen. It has already been pointed out that this so-called "direct marketing" is possible only for a few products, and for these only to a slight extent. Moreover, when it is possible, it is frequently subject to greater cost than is incurred in the more indirect methods of marketing now employed. For instance, it has been found that wheat handled by a large number of different kinds of middlemen between producer and the mill reached the mill at a cost of only about ten per cent of

[1] Extract from the report of the Massachusetts Commission on the cost of living, reprinted in W. H. Hamilton's *Current Economic Problems*.

the price paid by the miller, while the marketing of milk, which is marketed either directly from producer to consumer or by the assistance of one kind of middleman, involves a cost of sixty-two and one-half per cent of the price paid by the consumer.[1] Another study of the costs incurred by truck growers in selling their products direct to the consumer in the city public market showed that the cost averaged approximately fifty per cent of the price paid by the consumer.[2]

After our survey of the complicated methods of marketing employed for different farm products, the student will probably realize that no rule-of-thumb method could be devised that would solve all the difficulties, and no single marketing agency, public or private, could efficiently carry on all the complicated processes involved in distributing the enormous volume of farm products.

It is difficult to speak in general terms of the methods of improving the system of marketing. However, we may summarize briefly some of the important lines of attack, as follows:

1. Efficient marketing must begin with production. Unless a community produces a uniform commodity, the marketing of that commodity must necessarily be inefficient and wasteful. Moreover, the commodity must be produced in the community in sufficient quantities to justify the development of efficient marketing machinery without incurring excessive costs. Furthermore, the producer can sell his product to best advantage when it is properly graded and packed.

2. The process of concentrating products physically in a central market for redistribution in consuming districts sometimes results in inefficient duplication of transportation and marketing costs — that is, often a producing community may

[1] Weld, L. D. H., "Studies in the Marketing of Farm Products," *loc. cit.*

[2] Sanders, J. T., "Study of Marketing of Truck Products in the Nashville Public Market," an unpublished monograph.

ship its product a long distance to a central market, and some near-by consuming community may send to this central market for the same commodity. It would be much more economical if the consuming community could purchase direct from the near-by producing community. The real obstacle is the lack of knowledge of supply and demand and the absence of marketing arrangements whereby the short circuiting of the process can be effected. Progress in coöperative organization of producers and consumers will tend to correct these conditions.

3. In some localities it is probable that buyers enjoy a local monopoly, either occasionally or regularly. While this may not affect the efficiency with which products are marketed, it may result in unfair prices to the farmer. The most important remedy for this condition is coöperation of producers in the marketing of their products.

4. Much progress has been made in improving local warehouse facilities and in effecting their suitable location. Such facilities should be further supplemented by arrangements for farm storage. This problem of local storage, however, varies greatly for different farm products.

5. It should be noted that all of the above methods of increasing efficiency can be largely promoted and carried out by farmers' coöperative associations. It may be doubted if there is a single method of marketing reform that will accomplish so much as the thorough local organization of farmers for the marketing of their products. It is also important to recognize the need of federation of local associations if the maximum of efficiency is to be achieved. However, such federations may in some cases result in monopolistic control over the products marketed. When this is the case, the remedy is not to destroy the organization but to regulate its charges in the interest of fairness to both producer and consumer.

6. There is still a great lack of uniformity in containers, methods of packing, grading, shipping, and price quotations

of farm products. Gradually this lack of uniformity is being reduced by the Federal Government and the states.

7. In the case of many cities the wholesale districts and the terminal facilities were established at a time when the city was very much smaller and, with the growth of the city, have become wholly inadequate. The result is that it is frequently necessary to handle products several times instead of selling them by the auction method in the railway yards, and frequent delays occur in the unloading of cars and the loading of drays and trucks because of the congestion in the railway yards.[1]

8. The selling of wholesale products at auction, especially where this can be carried on in the railway yards, is generally considered a very economical method.

9. There can be little question but that large cold-storage warehouses should be carefully regulated with respect to charges and to prevent discrimination. As far as possible an attempt should be made to prevent hoarding when this can be properly distinguished from the legitimate holding of goods for periods of scarcity.

10. In the case of certain farm products the market is very largely influenced by large-scale organization, such as the large packers and the cotton-oil mill interests, which may be said to be at least semimonopolistic. It is probable that these large-scale organizations are justified in part by efficiency in the handling and distribution of the products in which they deal. Consequently it would probably be undesirable to break up such organizations. Nevertheless, they should be carefully regulated to prevent the domination of the industry to the injury of independent producers and consumers.[2]

[1] For a study of these conditions in the city of New York see the report of the Mayor's Market Commission, 1913. A somewhat similar study for the city of Chicago is contained in E. G. Nourse's *The Chicago Produce Market.*

[2] In the case of the packers such regulation has recently been provided for by legislation.

11. Great progress has been made in the development of more efficient Market News Service for different farm products. Still further progress along this line will result in increasing efficiency.

12. It has already been pointed out that a large part of the expensiveness of retailing is due to the demands of consumers for costly services. Consequently if consumers would assist in reducing prices which they must pay for food products, they must be willing to modify the demands for such services. Such modifications can be fully accomplished only by consumers' coöperation, which may be effective in reducing consumers' prices partly by eliminating useless demands for costly service, partly by increasing and making more certain the volume of business in proportion to capital employed, and partly by economizing some of the expenses involved in competition between retailers. (See page 465.)

13. In the case of some farm products exported to foreign countries, the export trade could be greatly enlarged if the government or some other agency would take the initiative in standardizing the quality of goods exported. For instance, some years ago American cheese failed to compete successfully with Canadian cheese in the English market because the poorer grades shipped by inefficient producers in the United States injured the reputation of the better American cheese.

QUESTIONS ON THE TEXT

1. What are the twelve main groups of marketing functions? What are the four principal steps usually found in the direction of goods to the most advantageous market?
2. What are the important services furnished by retailers?
3. Summarize the characteristics of a well-developed system of marketing.
4. What conditions are favorable to the most complete development of a system of marketing?
5. Could one judge from the total price margin between producer and

consumer whether or not the marketing services are performed at a fair charge? Explain.

6. What conditions are tending to increase the cost of marketing farm products?

7. To what extent is it possible to employ direct marketing?

8. Discuss the conditions that tend to limit its practicability.

9. Mention the various ways in which farmers sell their products.

10. Describe the characteristic functions of each of the following classes of middlemen in the wholesale market: (*a*) commission men, (*b*) wholesale receivers, (*c*) shippers, (*d*) scalpers, (*e*) brokers, (*f*) general consignees, (*g*) jobbers.

11. What conditions tend to reduce the proportion of goods shipped on commission as compared with the proportion purchased direct by city wholesalers?

12. What are the principal kinds of storage agencies in central markets?

13. Mention the various kinds of business men who are connected with a produce exchange.

14. In what ways do produce exchanges facilitate the business of marketing farm products?

15. In what respects are the functions of the exporter different from those of other wholesale merchants?

16. What conditions are likely to prevent municipal public markets from fulfilling completely the large hopes of their promoters?

17. What policies and conditions are likely to be favorable to a moderate degree of success on the part of municipal public markets?

18. Does the large share of the consumer's dollar which goes to the retailer indicate that retailers as a class enjoy excessive profits? Explain.

19. Why is retailing so much more costly per unit of product than wholesaling?

20. What special services are performed by pushcart men?

21. Is marketing production? Explain.

22. Is the cost of marketing necessarily decreased by decreasing the number of kinds of middlemen? Is the number of middlemen necessarily decreased thereby?

23. Summarize the various lines along which improvement in the present system and methods of marketing may be effected.

SPECIAL PROBLEMS

1. Discuss the conditions under which it is more economical to ship products by parcel post than by express, and vice versa.

2. Describe the Market News Service of the United States Bureau of Agricultural Economics.

3. Outline the functions of the state marketing commission or bureau in one of the following states: Wisconsin, California, New York, North Carolina.

4. Summarize the principal provisions of the United States Packer-Stockyards Act.

5. Describe the federal grading system for wheat.

6. Write an account of the Saskatchewan Coöperative Elevator System.

7. Compare the advantages and disadvantages of each of the following kinds of retail agencies: (*a*) neighborhood grocery stores, (*b*) chain stores, (*c*) hucksters, (*d*) public markets, (*e*) private markets.

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CHAPTER XXIV

PRICES OF FARM PRODUCTS

I. Nature of market prices
II. Explanations of variations from the price level in the same market
III. "Discovery" of prices in the wholesale market
  1. The trade-journal method
  2. The exchange-committee method
  3. The call-board method
  4. Discovery of prices by organized and concerted trading in produce exchanges
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  5. Relation of future trading to the determination of market prices of farm products

The conditions which influence the price of any product are so numerous and complex that it is necessary to describe a step at a time the operation of the various influences.

I. Nature of market prices. — We speak of market prices. What do we mean by the term "market" as so used? *We may define "market" in this sense as a general region within which the various influences affecting price tend to produce a uniform price level.* The student will note that we have used the term "market" in a different sense from its employment when we speak of a "city public market." Such a market is merely a place more or less conveniently arranged for the buying and selling of goods.

As suggested in previous chapters, the market for some products is much more extensive in area than the market for other products — for instance, we may well say that in time of peace there is practically a world-wide market for wheat. By this we mean that the price level of wheat tends to be uniform in most of the civilized countries of the world, whereas the market for strawberries, for instance, may be confined to a single city.

II. Explanations of variations from the price level in the same market. — When we say that a market is a region within which prices tend toward a uniform level, it is important to explain what is meant by the term "level." *By this term we mean that throughout the territory of the market, prices move up and down in somewhat the same proportion and in response to the same causes but not that the same price exists everywhere within the territory.* For instance, wheat may be selling in New York for $2.00 a bushel and at Liverpool for $2.25 a bushel, the difference being due to the cost of transport. If, however, wheat in Liverpool tends to fall or to rise in about the same proportion as in New York, at about the same time, and due to similar causes we may say that both belong to the same general level of prices.

Several conditions explain the differences in the prices of a particular product within the same market area. One of these conditions has already been mentioned, namely, cost of transport. Some portions of the market may represent what we may call "permanent deficit areas" — that is, areas that must always depend on outside regions for a sufficient supply of the product. Other parts of the market may be considered as "permanent surplus areas" in the sense that these districts produce more of a particular commodity than they consume. In a deficit portion of the market area the price must be sufficiently higher than the price in the surplus areas to defray the expense of shipment from the surplus area to the deficit area.

Some parts of the market area are sometimes deficit areas and sometimes surplus areas, depending on fluctuations in supply and demand.

Another reason why there may be different prices under the same price level is that the product may be at various stages of advancement in its movement from producer to consumer. If a product must follow a regular path through the various middlemen stages in order to reach the consumer, it must normally sell for a sufficiently higher price at each stage to cover the cost of its movement from the preceding stage. Thus, the farm price of wheat is usually lower than the wholesale price while the price of wheat in the hands of a retail seedsman or seller of wheat is normally higher than the wholesale price. However, all three prices may represent the same general price level — that is, all three tend to move up and down together in response to somewhat similar causes. It should be noted, however, that it may require considerable time before the price of the commodity in all of these stages has responded to a cause of a change and a new level representing similar price proportions has been established, and this response to the cause may be very much more rapid at one of these stages than at another stage. Thus, the retail price of flour may not increase immediately after an increase of the wholesale price, because the retailer has on hand a stock of flour and does not find it necessary immediately to raise this price.

The third reason for price differences under the same price level is that the terms of sale may vary — that is, goods may be sold on credit or for cash; they may be sold subject to delivery by the seller or by the buyer. The seller may or may not agree to pay the cost of shipment and insurance and may or may not agree to warrant the goods sold, etc.

A similar cause of differences of prices of the same kind of commodity in a given market at a particular time is different quantity units of sale. Thus, a consumer is charged higher

prices per unit for small quantities than for purchases in large quantities. On the other hand, a seller or shipper is likely to receive a more favorable price per unit for a large shipment than for a very small shipment.

Seeming differences under the same price level may also be due to differences in quality. Sometimes goods are sold in bulk — that is, they are not graded, the buyers assuming the risk and expense of grading the product. Sometimes the product may be sold by sample and sometimes by grade.

III. **"Discovery" of prices in the wholesale market.** — Because of the elaborate arrangements for obtaining information from all parts of the regions of production and consumption, wholesale prices reflect more fully, more quickly, and more accurately all the influences affecting prices than do local producers' prices and local consumers' prices. The wholesale price, therefore, is most influential in determining what retailers' prices will be and what prices will be paid to farmers for their products. It is true, consumers' prices and farmers' prices ultimately affect wholesale prices in turn, but the wholesale market may be regarded as the center in which are reflected influences determining prices throughout the general market area. It is important, therefore, to understand how prices are actually determined in the wholesale market.

The student should understand, however, that the methods of price determination referred to represent not so much the processes by which the prices are made to be what they are as the processes by which they are discovered. Various influences yet to be studied make a certain general level of price necessary at a particular time. In the various wholesale markets, however, there are different ways in which this necessary price is discovered and published to the world.

1. *The trade-journal method.* — In some markets a trade paper has won the confidence of dealers to such an extent that its price quotations are considered standard, or official, for that

commodity. The action of such a journal is not to fix prices but simply to discover price. This is accomplished by a careful study of actual transactions. If the price published is not very close to that which is representative of the day's trading, it is clear that the confidence in the accuracy of the journal's price quotation would soon be destroyed.

2. *The exchange-committee method.* — In some markets there is a committee of a produce exchange to decide what price is most representative for the day's business. The method employed is very similar to that used by the trade journal. It may be thought that such a committee would be influenced at times by the desire to make prices higher or lower than market conditions justify. However, a committee is likely to be representative of the different interests in the trade. Some of the members represent those who are interested in selling and who, therefore, desire a high price, while others represent buying interests who are seeking as low a price as possible. Furthermore, if the committee exhibits partiality or unfairness in its decisions, it will soon be discredited.

3. *The call-board method.* — In some markets an attempt has been made to substitute actual trading for the arbitrary methods of price discovery described above. One of these is the call-board method. (See page 414.) Representatives of the trade meet at a certain time and make bids for and offers of products in which they are trading. These bids and offers are written on a blackboard. The price that is just high enough to clear the board of all offerings is taken to be the representative price in the market. The trouble with this method is that the transactions represent only a very small part of the total volume of trading in the market and may not be exactly representative of actual conditions.

4. *Discovery of prices by organized and concerted trading in produce exchanges.* — Under this method a great majority of all the purchases and sales of the product are made in a single room,

so that the resulting price at any given time reflects the actual conditions of supply and demand in that market. This method is employed for grain, cotton, coffee, barrel pork, and other products.

Members of the exchange gather at certain hours of the day in a single room for the purpose of buying and selling one or more products. Each member is prepared to buy and sell in large quantities, either on his own account or to fill orders of other persons for purchases and sales on commission.

Trading on the exchange is very active and is rendered easy by the fact that standard units of sale are employed. For instance, in the Chicago Wheat Pit 5,000 bushels or some multiple thereof represents the quantity unit of purchase and sale. The grades recognized by the exchange are carefully defined so that little time need be lost in discussing the quality of the product in making a trade. In fact, a large part of the speculative buying and selling in most produce exchanges is based on a single grade. Finally, the various contracts employed are carefully standardized. Under these conditions a trade may be effected almost in an instant. Most of the offers and acceptances are made merely by signs of the hand or nod of the head. So strict are the rules of the Exchange with regard to the observance of contracts that these oral agreements, often involving many thousands of dollars, are fulfilled almost without question.

a. Distinction between "spot" and "future" transactions. — The various transactions on the exchange may be divided into two main classes, spot transactions and transactions for future delivery, or futures. A "spot" transaction is one in which the seller agrees to deliver a certain quantity of the product which he actually owns at the time of sale or as soon as physically possible. It should be noted that the delivery may be postponed for some time, for the sale may represent a product that is on its way to the market or has not even started. A

" future " contract is one in which the seller agrees to deliver at a future date a product which he does not own at time of sale.

All such future contracts require the actual delivery of the product unless some form of settlement between the two parties has been made before the time of delivery arrives.

The distinction between future transactions and spot transactions is not necessarily a distinction between speculative and nonspeculative dealings. In fact, while a large number of future transactions are made purely for speculation, a considerable volume of these contracts is for the purpose of hedging — that is, to reduce the risk involved in some other transactions. (See p. 486.) On the other hand, spot transactions may be speculative — for instance, a man may buy 100,000 bushels of actual wheat with the intention of holding it for an increase of price.

b. Methods of dealing in futures. — For simplicity trading in futures is confined to contracts for delivery in certain months of the year. In the case of the Chicago Wheat Pit, these delivery months are December, May, June, and September. If a member of the Exchange sells wheat in October to be delivered in December under what is known as the " seller's option " he may deliver his wheat at any time during the month. Usually, however, he will prefer to deliver it the first of the month in order to avoid storage charges.

When a sale has been made for future delivery, the buyer, of course, does not have to pay for the product until delivery is made. However, both parties to the transaction wish to be protected against the possibility that the other party may not be able to fulfill the contract. Consequently the practice of buying and selling on margins is employed. There are two kinds of margins, the fluctuation margin and the original margin. A fluctuation margin represents the deposit of a sum of money comprising the difference between the price of the product in the contract and the price on any particular day after

the contract has been made. If the contract calls for the delivery of wheat at $2.30 per bushel and the price of wheat afterwards falls to $2.28, the buyer may be asked to deposit the additional two cents. On the other hand, if the price rises to $2.32, the seller will be expected to make a similar deposit. The original margin is simply a certain percentage of the total amount of the contract deposited by each of the parties at the time the contract is made in order to guarantee that they will meet such fluctuation margins as may later be required. A man whose credit is good on the exchange may not be required to deposit an original margin.

c. Speculation in futures. — Dealing in futures may take the form either of purchases or of sales. If a man purchases for future delivery, he hopes that when his wheat is delivered he will be able to sell at a higher price. Speculation by selling is called "selling short" because the seller agrees to deliver a product which he does not own — that is, he is "short" the amount agreed upon. Consequently, he sells in the hope that the price will fall, for, if he has agreed to deliver wheat to the buyer at a price of $2.30 a bushel, he will make a profit of three cents a bushel provided he can buy the wheat at any time before the delivery day at a price of $2.27.[1]

Those traders whose transactions are made largely with the expectation of an increase in the price of the product are commonly known as "bulls," while those who expect to profit largely by declines in the price of the product are known as "bears." It should be clear, however, that a bull cannot always be a buyer. Sometimes he must sell in order to make his

[1] Formerly, certain transactions known as "options" were permitted on various produce exchanges. These contracts were so framed that one party or the other to the contract had the option of fulfilling the contract or not fulfilling it, according to which policy was dictated by his own interest. These option contracts are now forbidden on produce exchanges and also largely by state laws. They are also forbidden in the Capper-Tincher Bill, recently passed by Congress.

profit or to reduce his loss. Likewise, a bear must sometimes buy in order to obtain the commodity which he has agreed to deliver.

d. Settlement of future contracts. — The volume of future contracts greatly exceeds that of spot contracts. For instance, it was found by the United States Industrial Commission of 1900 that in the year ending May 31, 1891, the ratio of future sales to spot sales in the New York Cotton Exchange was nearly 100 to 1.

It is frequently said that these future contracts have no basis whatever in actual supply and demand but are merely contracts hanging in the air — sales of "wind wheat" or "wind cotton." It has been already noted, however, that such contracts involve agreements for actual delivery of the product. However, by far the larger part of the future contracts are cancelled in one of the following ways before the time of delivery arrives:

(1) By offsets — that is, balancing the sales of a particular individual against his purchases. Suppose, for instance, *A* buys 100,000 bushels of wheat from *B* at $2 a bushel and sells 100,000 bushels to *C* at $2.03 a bushel. If *C* will pay *A* three cents a bushel and *B* will agree to deliver the 100,000 bushels to *C* instead of to *A* at $2 a bushel, *A* can drop out with his profit of three cents a bushel.

(2) By direct settlement. Suppose *A* sells *B* 100,000 bushels of wheat for May delivery at a price of seventy cents a bushel, and that after the sale is made, the price falls to sixty-five cents a bushel. If *B* will resell the contract to *A* at sixty-five cents, the two transactions will cancel one another except that *B* will owe *A* five cents a bushel. However, it would not be necessary to go to the trouble to make the second sale, but *B* could pay *A* the five cents a bushel, and the contract could be destroyed.

(3) By ringing-out settlement. This is the same thing as direct settlement except that a circle is formed by a series of

transactions in which the first seller ultimately becomes the last buyer. Thus, *A* may sell *B* 100,000 bushels of wheat at seventy cents, *B* may sell *C* 100,000 bushels at seventy-one cents, *C* may sell *D* 100,000 bushels at seventy-two cents, and *D* may sell *A* 100,000 bushels at seventy-three cents. *A* has lost three cents and each of the other parties has gained one cent; therefore, the entire series of transactions can be cancelled by *A* paying one cent to each of the others.

(4) By transferable order or delivery notice. These methods of settlement are employed at the time delivery is to be made. If *A* sells *B* a future contract in November for the delivery of 100,000 bushels of wheat in December at $2 a bushel and the contract is not cancelled by some of the methods mentioned above before the date of delivery arrives, *A* will deliver to *B* an order on himself calling for the amount of wheat mentioned in the contract, or *A* may furnish *B* a notice of intention to deliver, giving warehouse receipts and other documents to show the location of the actual grain to be delivered. The price of the grain on these orders is that of the previous day's business, and the two parties settle between themselves any difference between that price and the price mentioned in the contract. Each of these documents is transferable by indorsement. Consequently, a whole series of purchases and sales can be cancelled by transferring these documents from one party to another without necessitating the physical delivery of the grain.

Some exchanges have clearing houses operated somewhat on the same plan as the clearing houses of banks — for the purpose of making easier the processes of cancellation described above.

It should be noted that the above methods of settlement make possible the limitation of losses and gains and also greatly reduce the amount of capital required for speculation. The speculator's best method of operation is to buy and sell continuously, taking the small profits and small losses per unit of

sale that may occur from day to day by reason of the changes of prices in the market.

e. Hedging. — One of the most important advantages of the system of future trading is to facilitate the process of hedging — that is, of insuring oneself against price changes by balancing transactions against one another. Country elevators, terminal elevator companies, wholesale receivers, exporters, and manufacturers employ hedging to avoid as much risk as possible in the regular transactions in which they are engaged.

Suppose the manager of a country elevator has purchased from farmers 100,000 bushels of wheat at $2 a bushel when the price of this grade of wheat in the wholesale market may be $2.03 a bushel, the difference being the cost of shipment from the local market to the wholesale market together with the profit of the local elevator concern. It may be that two weeks will elapse before the grain can arrive and be sold in the wholesale market. Extreme change in price may occur before that time. The risk may be reduced by the following method: Having bought the grain at a cost of $2 per bushel, the manager may sell a contract for future delivery of the same quantity, to be delivered at the time the purchased wheat arrives in the central market. If the price of the grain for future delivery is $2.03, the dealer is guaranteed against loss and is insured the three cents necessary to cover expenses of transportation and ordinary profit. This is called a "direct hedge." For the most part it is not commonly employed, for it necessitates finding a buyer who desires the exact grade of wheat to be delivered and who desires it just at the time the wheat is to arrive at the market. These difficulties can be avoided by what is known as the "indirect hedge," which involves twice as many transactions as the "direct hedge." For instance, *A*, having bought 100,000 bushels of wheat at a price of $2 per bushel at a time when the price in the wholesale market is $2.03, can sell the same amount of wheat for future delivery at, say, $2.08 a bushel. Suppose

that by the time the wheat from the local elevator arrives in the wholesale market the price of spot wheat has fallen to $2. In this case the dealer has lost the three cents necessary for the expense of transportation and his profit. However, it is probable that the price of wheat for future delivery will have fallen to the same extent as the price of spot wheat, so that instead of being $2.08 per bushel it is $2.05 per bushel. The country dealer can now buy back his future contract for $2.05, making a profit of three cents per bushel. This just balances the loss on the spot transaction. It is clear that this complete protection is only possible when the future price and the spot price change the same number of cents per bushel. This may not always be the case.

The hedging arrangements of a manufacturer buying raw materials will be the opposite of those just described. Suppose a manufacturer has entered into a contract to deliver flour three months in the future at a price which necessitates purchasing the wheat at $2 per bushel. In order to avoid the costs of storage, shrinkage, and the loss of interest on his money, it would pay him to wait to buy the grain until about the time he is to manufacture the flour if he could be sure of purchasing at a price no greater than $2 a bushel. He may insure this risk in the following way: By purchasing a contract for the same amount of grain needed for manufacture at, say, $2.07 a bushel the manufacturer's contract for flour will be hedged. If the price of spot grain has risen to $2.05 by the time the manufacturer desires to purchase the grain for manufacture, it is probable that the price for future delivery will also have increased five cents a bushel so that whereas the manufacturer must lose five cents on the grain purchased for manufacture he can resell his future contract at $2.12 with a resulting profit of five cents.

5. *Relation of future trading to the determination of market prices of farm products.* — Let us first turn our attention to some of the

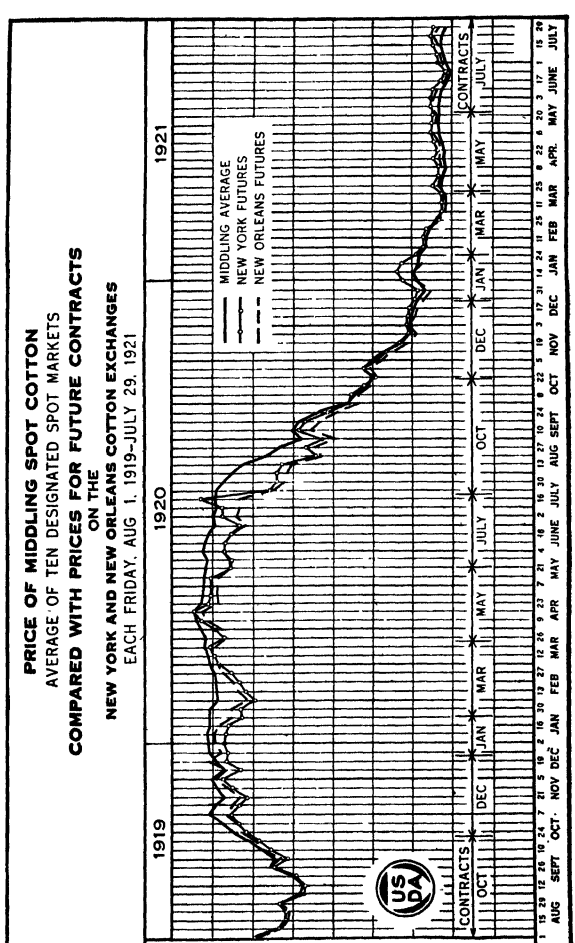


FIG. 74

Yearbook for 1921, U S Dept of Agr.

Note the close relation of spot prices and prices for future delivery. The former were somewhat higher than the latter from October, 1919, to October, 1920.

errors that have arisen with regard to this relationship. One common error is the idea that the volume of short sales in the market tends to lower the price received by the farmer for his product. This error usually arises in the belief that short selling tends to make the volume of sales exceed the volume of purchases. Consumers are inclined to interpret the matter in just the opposite fashion by assuming that the buying of future contracts tends to create an excess of purchases over sales and thus unduly to raise the price which the consumer must pay for the product. However, it has already been pointed out that there can be no sale without a corresponding purchase.

Of course, the offers to sell made by bears at a given time tend to depress prices, while the bids to purchase made by bulls tend to have the opposite effect. It may be thought from this that bears may be able to lower the price merely by making numerous offers or that bulls may be able to increase the price by making numerous bids at prices much above the existing level. It should be noted, however, that if an offer to sell is too much above the existing price or the offer to buy too far below it, the offer is not likely to be accepted, while if the offer to purchase is too far above the existing price or the offer to sell too far below it, the offer may be accepted with disastrous consequences to the one who made it. Some people have mistakenly thought that all the dealers in the market sometimes form an agreement to force the price out of line. However, at any given time there are numerous persons in the market who are "long" on the product — that is, who have bought more than they have agreed to sell and others who are "short" — that is, who have agreed to sell more than they have bought. Consequently, it is entirely unlikely that the two classes could agree on a concerted policy.

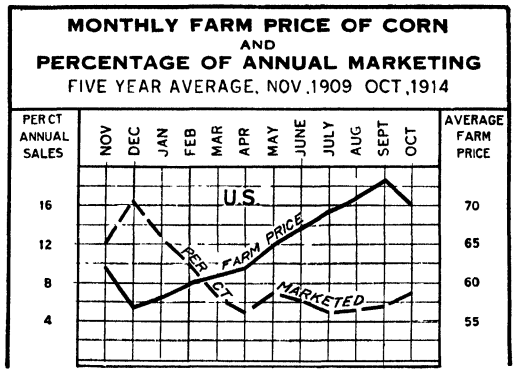
The fact is that a speculator is not permanently interested in the prices' moving in either direction, for it is possible to make money either by buying or by selling, according to the condi-

tion of the market. Consequently, the average speculator is most concerned in guessing correctly the direction in which the market is likely to move.

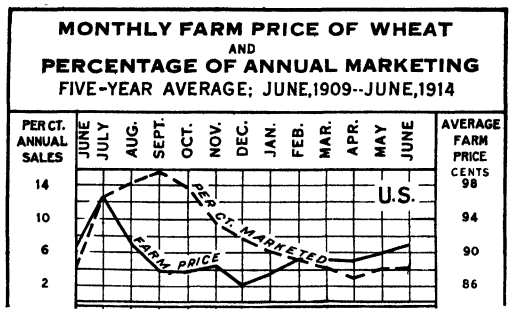
Another error is the assumption that the profits made by speculation constitute a charge on the product which must either come out of the price paid to farmers or must be added to the price paid by consumers. It should be clear, however, that profits are made both by falling prices and by rising prices. How could both kinds of profit be added to the price of the product? In reality the speculator's profit comes out of other speculators — that is, either those who are regularly dealing in the exchange or from the " lambs " who venture to speculate from the outside. In short, the speculator's profits no more add to the regular cost of marketing the product than the profits made by certain persons in bidding on horse races increase the price of horses.

Many farmers believe that speculation tends to lower the prices regularly in the autumn because of the large offerings made by farmers at that time or because speculators themselves take advantage of these offerings to beat down the prices to an undue extent. It is true that for an average of many years the price of a product is likely to be lower at harvest time than it is later in the year. This is necessary because of the additional cost of storage and holding. However, studies of the average prices of principal speculative products, such as corn, wheat, and cotton, for a number of years in the pre-war period, have not shown a marked difference between the harvest price and the price later in the season that might not be explained largely in terms of carrying charges.

Organized speculation tends to reduce the spread between harvest prices and prices at a later time in the year. The more completely future prices can be anticipated the less likely it is that this spread will be greater than the cost of holding. For instance, if it were clear that wheat would be twenty cents a



(a)



Yearbook for 1921, U. S. Dept. of Agr.

(b)

FIG. 75

Farmers believe that the practice of selling the bulk of their crops within a period of a few months results in greatly depressing the price received. On the other hand, one might expect the active speculation of traders on the exchanges dealing in futures would eliminate, on the average, any difference between prices at harvest time and at other seasons of the year greater than the cost of holding. If seasonal variation in supply marketed were the only influence involved, the tendency for seasonal variations to be limited to cost of holding would be indicated generally by monthly curves of prices. However, many other influences affect the monthly changes in prices, such as sudden variations in demand and changes in crop conditions in other parts of the world.

bushel higher in three months than it is at harvest time, while the carrying charges are only five cents a bushel, there would be such a scramble to buy in order to make this certain profit that the price at harvest would be thereby increased. It is quite possible that the price of wheat in the spring of a given year may be higher than the harvest price plus the cost of storage, but this is due to the fact that the speculators have not guessed correctly the future course of prices. On the other hand, the opposite might be true; namely, that they guessed the future price too high.

The greatest activity is in the buying and selling of futures, and the spot price is likely to be closely related to the future price. However, it should not be understood from this statement that the future price itself is not influenced by the actual supply of the product and the actual demand for it for purposes of consumption. The future price is influenced by actual supply and demand both directly and indirectly. It is influenced directly because of the fact that some of the future transactions represent the desire to sell or to buy actual grain, and after the cancellation processes (p. 484) are completed, there will remain some persons with obligations to deliver or to receive actual grain or cotton. The indirect influence arises from the fact that by observation of actual conditions affecting supply and demand the speculators are trying to determine the direction future prices will move. Such factors as the condition of the crop, the amount of grain in storage, the volume of exports, the scarcity or abundance of storage space for the product have immediate influence on price. Moreover, such conditions as the scarcity or abundance of bank credit, the rate of exchange, supply of ocean tonnage, international conditions indicating peace or war, prospective tariff changes, and other conditions that tend to point toward prosperity or depression are carefully considered since all of these factors tend indirectly to influence actual supply and demand — especially the latter.

In short, many speculators are endeavoring to make an intelligent prediction based on actual facts of supply and demand, and many of them spend large sums of money to gather information that will enable them to be most accurate in their estimates.

A great deal of the hostility to organized speculation has arisen from the idea that an individual or group of individuals may succeed in "cornering" the market — that is, buying up so large a proportion of the product that the owner has a monopoly and is able to dole out his product in small quantities at an exorbitant price. The supply of grain or cotton is so large that it is exceedingly difficult to obtain a corner in either. A more common occurrence is a "squeeze." A "squeeze" occurs when bears have been attempting to oversell to an undue extent, while at the same time a group of bulls have been buying up the spot supply available in the warehouses of a particular wholesale market so that when the delivery day arrives the bears find themselves unable to obtain the actual wheat or cotton necessary to carry out their contracts and are compelled to pay heavy penalties in order to escape.

Since the future price largely reflects the mental attitude of speculative buyers and sellers concerning the probable movement of prices, it is clear that at times their actions may be based on imaginary or unreal conditions rather than on real facts. Thus a false rumor or a misstatement or even the actions of some prominent speculator may have an influence on the opinions of dealers in the market.

QUESTIONS ON THE TEXT

1. Define "market" as used in the expression "market price."
2. What is meant by a price level?
3. What conditions cause prices of the same kind of commodity to be different in the same market area? May these differences exist even though the price level is the same?
4. Mention and explain each of the various ways of quoting prices.

5. Mention and explain each of the principal methods of discovering prices in the wholesale market.

6. Describe the methods of organized buying and selling on produce exchanges.

7. Distinguish between spot and future transactions.

8. Distinguish between fluctuation margins and original margins.

9. What is meant by "selling short," and how can a profit be made from such a transaction?

10. Explain the various ways by which future contracts are cancelled or settled.

11. Describe the methods of direct and indirect hedging to cover a purchase of grain.

12. How may an agreement to sell grain in the future be directly hedged? Indirectly hedged?

13. "The practice of selling short tends to reduce the prices of farm products." Criticize.

14. Are speculators as a class interested in the price moving in a particular direction? Explain.

15. Are the profits of speculators added to the consumer's price? Deducted from the farmer's price? Explain.

16. "Organized speculators tend to make the price low at time of harvest and high in the later months." Is this true?

17. Are the prices for future delivery influenced by actual supply and demand? How?

18. Distinguish between a corner and a squeeze.

SPECIAL PROBLEMS

1. Summarize the policy of the Food Administration in controlling prices during the World War.

2. Outline the principal provisions of the United States Future Trading Act.

3. Write an account of the experience of the Chicago Milk Producers Association in trying to fix a price for milk.

4. Prepare a table showing for an average of ten years the monthly prices of one of the following products: wheat, cotton, butter, eggs. (See *Yearbook* for 1921, United States Department of Agriculture.)

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CHAPTER XXV

PRICES OF FARM PRODUCTS (*Continued*)

IV. Fundamental influences affecting prices
1. Demand and supply
2. Classes of buyers, or demanders
3. Influences affecting consumers' demand
4. Law of demand
5. Elastic demand
6. Classes of sellers
   a. Producers
   b. Merchants
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7. Law of market supply
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9. "Fixing" the price
10. Relation of cost of production to price
11. Control of price through control of production
12. Relation of prices to the value of money
13. How changes in the value of a dollar are measured
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15. Relation between prices and the business cycle

IV. Fundamental influences affecting prices. — We have been studying some of the market conditions under which prices are discovered. It is clear, however, that the market merely reflects the real conditions that tend to make the price what it is. We have now to study these conditions and the way in which they influence price.

1. *Demand and supply.*— The popular explanation of prices is contained in the formula "demand and supply." This formula, while useful, is not entirely satisfactory, for we still

need to know what are the conditions affecting demand and supply and especially to know what we mean by those terms. Moreover, demand and supply are each, in turn, affected by price, so that in a sense demand and supply determine price and price determines supply and demand. However, the phrase "demand and supply" provides a convenient way of classifying forces that influence price in opposite directions. An increase of the demand forces tends to increase prices, while an increase in the supply forces tends to decrease prices.

We may define "demand" as the quantity of a commodity which will be purchased at a given time at a particular price. Thus, demand is not a fixed quantity but merely a quantity that varies according to price itself. *Likewise, "supply" is not a fixed quantity of goods but comprises the quantity that will be offered for sale at a particular price, and this quantity will vary as a result of changes in the price itself.*

2. *Classes of buyers, or demanders.* — Demand is the result of the action of buyers or would-be buyers. We may classify buyers in three groups:

a. Consumers

b. Producers who are buying in order to use the product for further production, as, for instance, millers who are buying wheat to manufacture

c. Merchants and speculators who are buying with a view to selling again

These three classes differ somewhat with respect to the motives that influence their actions, but they have one characteristic in common — they will usually buy more at a lower price than at a higher price. In the long run consumers are the most influential of the three classes; for producers, merchants, and speculators must continually depend on consumers to absorb the supply which they have purchased.

3. *Influences affecting consumers' demand.* — The influences affecting consumers' demand are:

a. Intensity of desire
b. Relative importance of other goods
c. Purchasing power

The reader's demand for candy depends in part on how much he likes candy. This liking may be affected by such influences as advertising, fashion, and imitation. At a given time, however, one does not desire an unlimited quantity of a commodity. As larger and larger quantities are acquired the additional quantities have less importance per unit than the smaller quantities. For instance, the reader might be willing to give as much as eighty cents a pound for two pounds of candy, but at the same time he would not give more than sixty cents for a third pound, more than forty cents for a fourth pound, or more than thirty cents for a fifth pound. This is called *the law of diminishing utility.* As the importance of the additional pounds of candy at a particular time becomes less and less the reader will finally reach the point where rather than purchase an additional pound of candy he would prefer to use the money to buy something else that he desires.

Just how much candy the reader will buy at a particular time will depend on several conditions, as follows:

a. The intensity of his desire for candy and the rate at which this desire for increasing amounts diminishes

b. The relative intensity of desire for other goods including goods that he desires for use at some future time

c. The amount of purchasing power the reader has and also the amount that he may expect to have in the immediate future

d. The price that he has to pay for the candy and the prices that he has to pay for the other goods that he considers purchasing in comparison with candy

4. *Law of demand.* — The demands of numerous individuals make up the total demand for any commodity at a given time, and generally speaking, this total demand conforms to the law

already suggested — namely, that *at a given time more will be demanded at a low price than at a higher price.*

5. *Elastic demand. — If a given change in price results in a large proportionate change in the amount demanded, the demand is said to be "elastic."* For instance, if a ten per cent increase in the price of potatoes causes a decrease of only three per cent in the number of bushels demanded, while a ten per cent increase in the price of eggs causes a decrease of eighteen per cent in the amount demanded, the demand for eggs is more elastic than the demand for potatoes.

Obviously, if the demand for a commodity is inelastic, a small decrease in supply is likely to result in a proportionately large increase in price, while a small increase of supply is likely to result in a very marked decrease of price. The opposite conclusions apply to a commodity the demand for which is elastic.

6. *Classes of sellers.* — We may turn now to consider supply. Sellers differ from buyers in that for the most part the motives that govern them are not those of personal consumption, but rather, business motives — that is, they sell for the purpose of making a profit or of reducing a loss. We may recognize three classes of sellers:

a. Producers who sell what they produce. In the long run this class has a large influence on price because the actions of the members of this class determine the quantity of the commodity that will ultimately be available for the market.

b. Merchants who have bought goods to sell again. Usually the merchant is engaged in a regular business of distributing goods which permits him a fairly definite margin above the purchase price to cover the expenses of the business and allow a profit. The size of this margin may depend in part on volume of business and rate of turnover. Of course, after the merchant has purchased a supply, some condition may arise to change the price to a marked extent, and he may have to take

less than the price at which the goods were purchased, or he may be able to obtain a much higher price than he expected to receive.

c. Speculators who buy or sell with reference to the possibility of making a profit by rapid changes of price. A speculator is governed less by past considerations, such as purchase price, cost of operation, and so on, and more by expected change of price.

One of the important conditions that will influence the actions of all sellers is the total available supply of the commodity. If this supply is large (assuming the general tendencies of demand to have remained unchanged), it will be necessary to sell at a lower price in order to dispose of the entire supply than would be necessary if the supply were smaller.

7. *Law of market supply.* — Any person having goods to sell would prefer a high rather than a low price for them. Nevertheless, it may not necessarily be true at a particular moment that a fall of price will result in the sale of a smaller quantity than would be sold if the fall in price had not occurred. The action of sellers may be influenced by what they expect to happen. For instance, if the fall in price is believed to be only temporary, many sellers may decide to wait until the market has recovered. On the other hand, if the price increases, it is not necessarily true that the supply offered for sale will increase, for it may be expected that the increase will continue and that sellers will hold off so as to take advantage of the continued increase. Thus it is not invariably true that more will be sold at a given time at a high price than at a low price. In general, however, the sellers who actually own commodities, as distinguished from those who are merely speculating in them, desire to sell at as high price as possible, and therefore *it tends to be true that a high price will call forth a larger supply than would be available for sale at a lower price.*

8. *How demand and supply determine price.* — We have heretofore been considering separately the two classes of forces

that operate in the market — the demand forces and supply forces. Let us now put the two groups of forces together and see how they operate to determine the level of price. Table 24

TABLE 24. DEMAND AND SUPPLY OF WHEAT AT VARIOUS PRICES

(THE FIGURES ARE ASSUMED FOR ILLUSTRATIVE PURPOSES)

Bushels Demanded	Price per Bushel	Bushels Offered for Sale
400,000	$0.60	180,000
380,000	0.70	200,000
365,000	0.80	230,000
355,000	0.90	265,000
340,000	1.00	300,000
330,000	1.10	330,000
315,000	1.20	360,000
305,000	1.30	375,000
290,000	1.40	395,000
275,000	1.50	410,000
260,000	1.60, etc.	440,000

illustrates the general law of market price, which may be stated as follows: *At a particular time and in a given market that level of price tends to prevail which will result in the quantity demanded and the quantity supplied being equal.* For instance, it will be noted in the table that at a price of $1.10 the same amount of wheat will be offered for sale as will be purchased by demanders. If instead of this price prevailing, the price were, say, $1.40 per bushel, a greater quantity of wheat would be offered for sale than demanders would purchase. According to the table, however, there are those who are willing to sell at a lower price; thus, 375,000 bushels would be sold at $1.30 per bushel, and so on. Consequently, some of these sellers, fearing that they may not find buyers at the price of $1,40 per bushel, will bid against one another by reducing their prices, and if the price

is reduced, more and more demanders will be found who are willing to purchase wheat. On the other hand, if the price were $0.80 per bushel, a greater quantity of wheat would be demanded than sellers would be willing to furnish. Since, however, there are some demanders who are willing to pay a higher price rather than not obtain all the wheat they desire, they will bid against one another until the higher price induces sellers to part with a larger quantity. Thus, any level of price which tends to make the quantity demanded and the quantity supplied unequal cannot be considered a natural level of price.

It should not be assumed by the expression "natural level" that there is any permanent price at which the supply and demand will always be equal. The reason is that the conditions of demand and supply are constantly changing. The main point is that the two sets of forces are always tending to establish a level in which the quantity demanded and the quantity offered will be equal.

9. *"Fixing" the price.* — Although the term "natural price" used above should not imply a permanence of price, it does imply that at a given time and in a given market any other price than that which conforms to the law of price is unnatural. This principle is of significance from the standpoint of proposals to fix price by law or by some other form of arbitrary action. Suppose, for instance, that under the conditions assumed in Table 24 a price-fixing body attempted to establish a price of $1.40 per bushel for wheat. Since the price fixed is higher than the natural level, the result will be that more wheat will be offered for sale than purchasers are willing to buy. Since it is not practicable to force people to purchase more than they are willing to buy, some of the sellers will be unable to dispose of their supply. Such a policy, therefore, would be practicable only by prorating among the sellers the quantity that they may sell, reducing the amount below that which they would be willing to offer at the fixed price.

While it is conceivably possible to do this, yet it is difficult to carry out for the reason that some sellers may not be willing to play fair, seeking to increase the amount sold above their prorated share.

Many people confuse the naming of a price with the fixing of price. Frequently, farmers say that merchants and manufacturers fix the price of the goods they sell or that middlemen fix the prices which farmers receive for their products, when the real fact is that the merchant, manufacturer, or middleman merely names a price for the goods; the price is really fixed by conditions of competition over which the so-called fixer of the price has no control. If the merchant puts too high a price on the goods he has for sale, competitors will get the business, while if he asks too low a price, he will be losing money. In short, the person who puts the price on the goods is merely performing the function of *discovering* the price, rather than fixing the price. Of course, under conditions of monopoly, either temporary or permanent, the seller may fix the price in a more real sense; but we shall see later that even under these conditions he is not wholly free to fix any price he may desire.

By far the greater part of the goods which we buy and sell must be produced, and, therefore, the supply depends on the volume of production. These goods may be produced by agencies that monopolize the conditions of production, or they may be produced by competitors. Moreover, there are various intermediate conditions between these two extremes.

We may consider first the effect of producers' supply on price in the case of the competitive production of reproducible goods, for this is characteristic of practically all farm products.

If a farmer could know in advance of production just what price his products would bring and at the same time could know the cost of production, he would be able to decide intelligently whether the expected price will be sufficient to repay the cost, including a reasonable interest on capital employed, a fair wage

for his own time, and a return to cover the risks involved. Even under these favorable conditions the balancing of cost against return would be subject to much uncertainty. In fact, the farmer's ability to adjust his actions according to the relations of cost and expected price is very much less than that of a manufacturer. This is true for several reasons:

a. The manufacturer is not subject to extreme variations in volume of production due to weather, insects, plant diseases, etc.

b. The period between production and sale in many industries is much shorter than in the case of farming so that it is easier to anticipate the probable selling price.

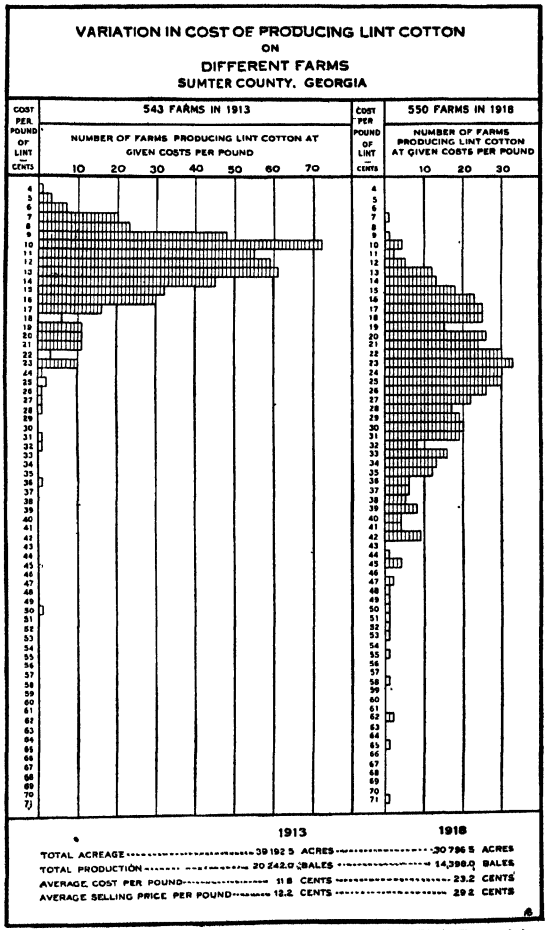
c. Because of the size of his business, the manufacturer is frequently able to employ skilled accountants to calculate his costs with a fair degree of exactness.

d. The prices of many manufactured goods are much less fluctuating than the prices of farm products and much more subject to control by the producer.

e. The larger manufacturers are in very much closer touch with the market than the farmer and have fuller information in regard to prospective changes. Moreover, many manufacturers sell on long-time contracts, so that they know in advance of production just what price they will receive.

10. *Relation of cost of production to price.* — It is sometimes said that price in the long run must tend to equal the cost of production plus a fair profit to the producer. It is also frequently stated that this ought to be true. These two propositions are entirely different and need to be separately considered.

We may first consider the question whether certain prices do tend to equal the cost of production plus a fair profit. This proposition rests on the assumption that, if a producer obtains less than the cost for any considerable period of time, he either will cease to produce or at least will reduce the quantity, with the effect of limiting the supply and causing the price to rise.



Department Bulletin 1034, U. S. Dept. of Agr.

FIG. 76

This chart illustrates the wide variation in cost of producing cotton for the different farms. Variations in the size of business and yield of cotton per acre were partly responsible for these differences in costs.

On the other hand, if the price is considerably higher than the cost other producers will be attracted into the production of the particular commodity or those already producing will increase their output, with the result that the total supply will be increased, and the price will tend to be lower.

It should be noted that this shifting of production with reference to price would affect only those producers whose cost of production is at or very near the price. Those producers whose cost is very much less than the price would probably continue to produce even if price were considerably lower than it is.

It is not necessarily true, however, that a producer will immediately discontinue production when the price falls to the point where it is insufficient to repay all the cost of production plus a fair profit. Several reasons for this may be cited:

a. If considerable capital has been sunk in an enterprise and cannot be removed without great loss, the producer may be willing to continue production for a time at a price which will just cover current expenses and bring some return for depreciation of the capital.

b. Sometimes two or more commodities have a joint cost — that is, the same expenditures are involved in the production of both (see page 89 above). Under these circumstances the cost of each commodity is indeterminate, and if the price for one commodity is so low that it furnishes only a small return toward covering the joint expenses, it may still be desirable to continue production in order to reduce to that extent the cost of producing the other product.

c. Because of the difficulties mentioned above which farmers experience in judging at the time production is undertaken what price is likely to be received or because of lack of knowledge of their costs, farmers will frequently make the mistake of producing some commodity which later sells for less than the cost of production.

In short, the cost of production in farming tends to exert an influence on price, but it is very far from true that the price tends to equal the cost of production of the individual farmer.

Let us consider for a moment the other proposition that price *ought* to be high enough to cover cost of production plus a fair profit. When all producers are subject to the same general level of price, it is hard to see how the formula just mentioned could readily be employed as the basis for accomplishing justice in price fixing. A price that will cover the cost plus a fair profit for one producer will yield an unusual profit to the producer who enjoys a lower cost, whereas there will be other producers, whose costs are higher than that price, who will lose money provided they continue to produce. The following table of actual costs in the production of wheat in the year 1919 will illustrate the differences in costs for different producers.

TABLE 25. VARIATION IN NET COST PER BUSHEL OF SPRING AND WINTER WHEAT, 1919, 481 FARMS[1]

Net Cost per Bushel	No. of Farms	Cumulative Per Cent of No. of Farms	Cumulative Production	Cumulative Per Cent of Production
$1.00	2	.4	14,560	1.5
1.10	4	1.2	33,772	3.4
1.20	5	2.3	42,432	4.3
1.30	9	4.2	83,124	8.3
1.40	10	6.2	124,582	12.4
1.50	21	10.6	186,224	18.7
1.60	21	15.0	246,750	24.8
1.70	26	20.4	315,980	31.7
1.80	25	25.6	394,671	39.6
1.90	38	33.5	480,954	48.3
2.00	33	40.3	557,097	55.9
2.10	30	46.6	605,992	60.8
2.20	25	51.8	648,842	65.1

[1] "Preliminary Report of Cost of Producing Wheat, 1919," Office of Farm Management, United States Department of Agriculture.

TABLE 25 — *Continued*

NET COST PER BUSHEL	NO. OF FARMS	CUMULATIVE PER CENT OF NO. OF FARMS	CUMULATIVE PRODUCTION	CUMULATIVE PER CENT OF PRODUCTION
2.30	21	56.1	714,092	71.7
2.40	22	60.7	749,148	75.2
2.50	19	64.7	782,706	78.6
2.60	18	68.4	823,751	82.7
2.70	23	73.2	861,350	86.5
2.80	13	75.9	875,028	87.9
2.90	9	77.8	890,832	89.4
3.00	9	79.6	900,095	90.4
3.10	7	81.1	907,874	91.2
3.20	5	82.1	914,115	91.8
3.30	8	83.8	925,168	92.9
3.40	6	85.0	934,894	93.9
3.50	8	86.7	945,095	94.9
3.60	5	87.7	950,425	95.4
3.70	4	88.6	953,610	95.8
3.80	5	89.6	960,171	96.4
3.90	6	90.9	964,377	96.8
4.00	—	90.9	——	96.8
4.10	3	91.5	967,360	97.1
4.20	4	92.3	970,815	97.5
4.30	3	92.9	973,456	97.7
4.40	3	93.6	976,626	98.1
4.50	3	94.2	981,028	98.5
4.60	3	94.8	982,834	98.7
4.70	3	95.4	984,432	98.8
4.80	—	95.4	——	98.8
4.90	2	95.8	985,402	98.9
5.00	2	96.3	986,969	99.1

Eighteen records representing .9 per cent of the production had costs exceeding $5.00.

Average cost, $2.15.

The table shows a range of cost from $1 per bushel for the two producers with lowest costs to over $5 per bushel for eighteen producers. The majority of producers are between these limits.

Many people, recognizing that different individuals have different costs, say that the price should cover the *average cost of production* plus enough more to give a fair profit. Now, the average cost in the table is $2.15. If the price were $2.15, more than half of the farmers would be getting less than cost of production. On the other hand, those producing at the very low costs would get a large profit.

Economists have frequently asserted that in the long run price must be high enough to cover the *marginal cost — that is, the cost of production to those producers who are just induced by the price to furnish that part of the supply needed to equalize demand and supply.* For instance, if the demand is for 986,969 bushels of wheat, the marginal cost is $5 per bushel, for there are two producers whose costs are $5 per bushel, with a total crop of 1,567 bushels, needed to make up the total of 986,969. If, therefore, there were demand for this amount at $5 per bushel, it would be necessary to have a price of $5 to cover the cost of these very inefficient producers.

However, neither those who produce at the extremely low costs of $1, $1.10, etc. nor those who produce at costs of $5 or more are really representative of the great majority of producers. Ninety-five per cent of the crop can be produced at a cost not exceeding $3.50. In order to get the small addition of five per cent it has been necessary to increase the price from $3.50 to $5. If the various demanders could agree to limit their demand to 945,000 bushels, instead of allowing a few over-eager demanders to bid the price up to $5, it would be possible to buy all but five per cent of the total for only $3.50, and if willing to limit their demand to ninety per cent, or 900,000 bushels, that amount could be obtained for $3 per bushel. *The price which will induce producers to furnish the great bulk of the supply — say, eighty-five or ninety per cent, excluding ten or fifteen per cent produced by very inefficient producers at excessively high costs — is known as the bulk-line price, and the cost*

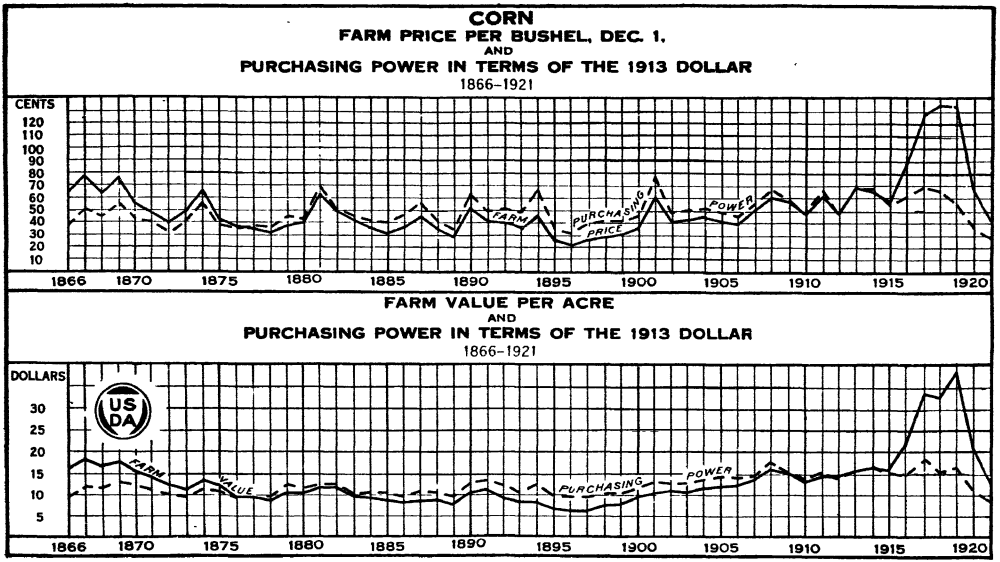


FIG. 77 *Yearbook for 1921, U. S. Dept. of Agr.*

The variations in farm value per acre are not so extreme as in the case of prices per bushel, for a large crop per acre tends to be associated with a low price per bushel and vice versa.

of the least efficient producers necessary to furnish this eighty-five or ninety per cent is known as the bulk-line cost. During the recent war some of the government price-controlling agencies employed the bulk-line cost as the basis for determining prices.

It is important, however, to recognize that cost alone cannot serve as the basis of determining prices. We cannot force people to buy more than they are willing to take at a given price. This is especially the case with the costs of a single year. The costs per acre may be about as high in a poor season as in a good season, and consequently the small yield per acre in a poor season causes the cost per bushel to be unusually high. In other districts the crop may be so abundant that the total supply is entirely adequate. Clearly it would be unfair, even if it were possible, to compel consumers to pay a price high enough to cover the cost per bushel in the region of crop failure. The fact is that there is a certain price at which the market will absorb a given supply, and if the price is fixed higher, it is necessary to count on a decrease in the quantity sold.

11. *Control of price through control of production.* — Taking demand as it is, it might be possible through control of supply to bring a larger total net return to all the producers than would be received if the price were determined under the ordinary conditions of competition.

This is illustrated in Table 26, which on the supply side is based on the table of wheat costs given above, except that for the sake of brevity some of the higher costs are omitted. The third column of the table shows the total costs of the different quantities produced. For instance, the cost of producing 33,772 bushels is the sum of the product of 14,560 times $1 plus the product of 19,212 times $1.10, etc. The demand is shown by the selling price (column 4) which represents the price at which the given number of bushels can be sold. As the number of bushels which are to be sold increases, the price per bushel at which they may be sold decreases. The fifth column

of the table shows the total return, as determined by multiplying the number of bushels by the price per bushel. The last column shows the net return determined by subtracting the total cost from the total return.

TABLE 26. ILLUSTRATING THE CONTROL OF PRICE BY CONTROL OF SUPPLY

Amount Produced (Bushels)	Cost of Added Bushels	Total Cost	Selling Price	Total Return	Total Net Return
14,560	$1.00	$14,560	$4.82	$70,179	$55,619
33,772	1.10	35,693	4.74	160,079	124,386
42,432	1.20	46,085	4.70	199,430	153,345
83,124	1.30	98,985	4.54	377,383	278,398
124,582	1.40	157,026	4.37	544,423	387,397
186,224	1.50	249,489	4.12	767,243	517,754
246,750	1.60	346,331	3.88	957,390	611,059
315,980	1.70	464,022	3.60	1,137,528	673,506
394,671	1.80	605,666	3.29	1,298,468	692,802
480,954	1.90	769,604	2.94	1,414,005	644,401
557,097	2.00	921,890	2.64	1,470,736	548,846
605,992	2.10	1,024,570	2.44	1,478,620	454,050
648,842	2.20	1,118,840	2.27	1,472,871	354,031
714.092	2.30	1,268,915	2.01	1,435,325	166,410
749,148	2.40	1,353,049	1.87	1,400,907	47,859
782,706	2.50	1,436,944	1.74	1,361,908	−75,036
823,751	2.60	1,543,661	1.57	1,293,289	−250,372
861,360	2.70	1,645,178	1.42	1,223,117	−422,061
875,028	2.80	1,683,476	1.36	1,190,038	−493,438
890,832	2.90	1,729,308	1.30	1,158,082	−571,226
900,095	3.00	1,757,097	1.26	1,134,120	−622,977

If all the producers were acting together to control the supply, and if they sought to fix the price in the interest of all the producers, rather than in the interest of only a few, it would be desirable to restrict the supply to 394,671 bushels; for this could be sold at a price of $3.29 per bushel and give a larger net return than could be obtained by producing any other quantity.

If competition were free, the price would be between $2.01 and $2.27 per bushel — that is, at the point where the additional cost per bushel (including necessary profit) approximately equals the highest price at which the quantity produced can be sold.[1]

It is important to note that the principle of price determination when the supply is controlled, as illustrated above, rests on the assumption that there is complete control of supply and that this control is exercised in the interests of the entire group, rather than in the interest of only part of the group. Any one producer, of course, is interested in the greatest possible restriction of supply so that the selling price may be as high as possible. On the other hand, he is interested in increasing his own volume of product beyond his pro rata share provided the increase can be effected at an additional cost sufficiently low to add anything to his total profits.

12. *Relation of prices to the value of money.* — Prices are expressed in terms of money. Thus we say the price of wheat is $1.75. Now, in our American currency, a dollar is the equivalent in value of a certain amount of gold (23.22 grains, nine tenths fine). This quantity of gold does not always have the same value, any more than a bushel of wheat always has the same value. Consequently, as the value of a dollar changes, the price of a particular commodity necessarily changes, even though the general conditions of demand and supply for the commodity have not been affected. Suppose, for instance, that a dollar should suddenly fall to one half its former value. If the price of wheat had formerly been $1.75, it would now have to sell for $3.50 in order to have the same purchasing

[1] It may appear that this last principle of determining price under conditions of unrestricted competition is different from the principle stated on page 501 above. In reality, however, the principle is the same, the apparent difference being due merely to the fact that in the illustration on page 501 demand was given as the quantity that would be bought at a given price, while in Table 26 it is given as the price at which a given quantity will be purchased.

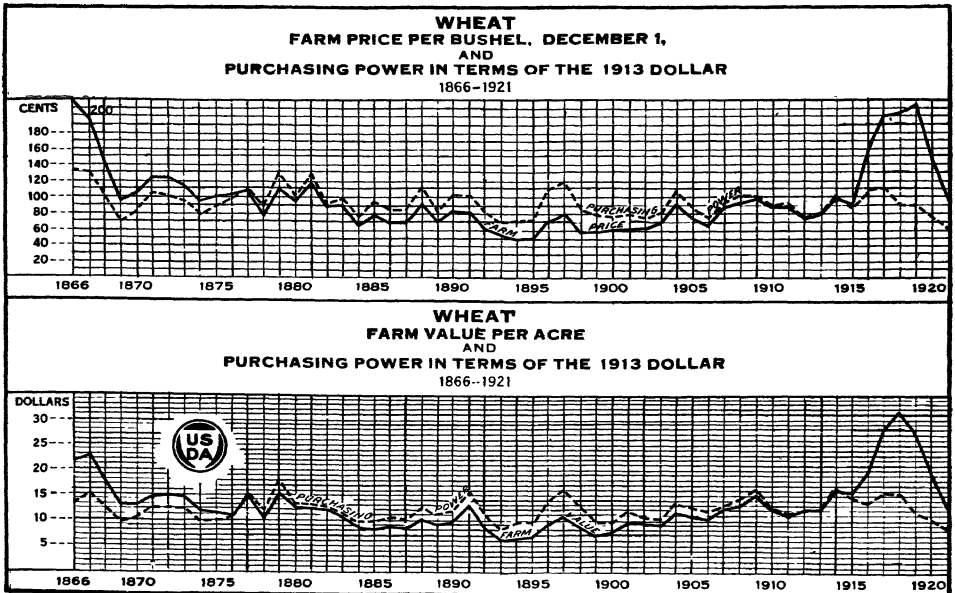


FIG. 78 *Yearbook for 1921, U S Dept of Agr.*

The value per acre for wheat is more extremely variable than for corn. A smaller proportion of the world supply of wheat is produced in the United States than is the case with corn.

power as before; on the other hand, if the value of the dollar doubled, wheat selling at eighty-seven and one-half cents would have as much purchasing power as before.

Clearly it is important to distinguish the changes in the price of a product due to special conditions affecting the supply and demand of a commodity from changes due to variations in the value of a dollar. For instance, it is theoretically possible that the value of the dollar might decrease fifty per cent, with the result that the price of wheat would increase fifty per cent but without any important change in the value of wheat — that is, its ratio in exchange for other commodities. As a matter of fact, sudden changes in the value of the dollar temporarily, at least, alter the values of different commodities, for prices of different classes of commodities will not respond to the charge with equal rapidity.

13. *How changes in the value of a dollar are measured.* — How can we tell whether the variation in the price of a product is due to some change in the special conditions of demand or supply affecting that product or whether it is due to a change in the value of money? This can approximately be ascertained by the use of index numbers of prices, as shown in Table 27.

TABLE 27. INDEX NUMBERS OF PRICES

(THE FIGURES ARE ASSUMED FOR ILLUSTRATIVE PURPOSES)

Commodity	Price in 1910	Index Number	Price in 1920	Index Number
Corn (per bu.)	$0.80	100	$1.76	220
Rice (per lb.)	0.05	100	0.13	260
Cotton (per lb.) . . .	0.10	100	0.20	200
Hay (per T.)	10.00	100	16.00	160
Leather (per lb.) . . .	.30	100	0.66	220
Calico (per yd.) . . .	.08	100	0.20	250
Wheat (per bu.) . . .	1.75	100	3.50	200
Tea (per lb.)	0.40	100	0.32	80

We may take 1910 as the basal year from which we want to measure price changes in a later year, say 1920. The price of each commodity selected in 1910 is considered 100 per cent. The index number of each commodity in a later year is the percentage of price in that year to the price in the basal year. The average of the index numbers for 1920, as compared with 100 per cent, the average for 1910, expresses the amount of change in prices during the period.

If a large number of commodities, properly selected, have been included in the table of index numbers, the change in the average index number may reflect fairly closely the change in the value of money.

14. *Conditions affecting the value of money.* — We cannot undertake to consider the various theories that seek to explain the changes in the value of money. The influences affecting the value of money are numerous and complex, but perhaps the most important is the quantity of money. This comprises not only the quantity of gold, but also the quantity of government paper money and bank notes and the volume of commercial bank deposits. Since government paper money and bank notes are only promises to pay, general confidence in the ability and willingness of the government to pay has an important influence on their value.

15. *Relation between prices and the business cycle.* — There is a more or less regular recurrence of periods of prosperity and depression, or hard times. At the close of a period of depression, credit is easy to obtain and on favorable terms, prices of materials are low, and large numbers of laborers are anxiously seeking work. On the other hand, because of the period of stagnation of business and the enforced idleness of mines, factories, and other producing agencies, stocks of goods will have become scarce.

Such conditions are favorable to the starting of new enterprises by investors, hitherto timid and hesitating. This makes

a demand for materials such as steel, lumber, brick, etc., and the producers of these commodities increase their production. This increase in productive activity means an increased employment of laborers, who in turn will be enabled to buy various kinds of consumption goods, thus enlarging the volume of business of producers and distributors. In short, "one thing calls for another," as the saying is. If the government, by virtue of a war or other necessity, is led to make a large increase in demand for goods and services, this is likely to be a powerful influence in stimulating business activity.

Unfortunately, the improvement in business conditions almost invariably becomes abnormal. As the demand for the limited stocks of goods is gradually enlarged the prices of these goods increase somewhat, and the higher prices, together with the larger volume of business, mean larger profits. These larger profits tempt old business firms to enlarge their activities and new firms to enter the field. Factories and stores are enlarged and new ones built, thus still further stimulating the demand for materials and labor and increasing the prices for these goods. All this expansion of business has to be financed by enlarging the volume of credit. The enlarged purchasing power due to the increased volume of credit still further increases demand and, consequently, prices.

Thus the process becomes one of continually increasing prices and expansion of credit. The conditions become more and more abnormal and come to a sudden end. Frequently the termination of the upward movement is due to the fact that banks have reached the end of the process of safe credit expansion.

The result is that demand for goods used in enlarging factories and other businesses is suddenly reduced, prices of certain goods no longer increase, and a large part of the demand due to speculation because of the expected rise of prices falls off. Prices begin to decline, and as they decline, the demand

diminishes greatly, for no one wants to buy large stocks of goods which are declining in price. Rents and other fixed charges decline less rapidly than prices, and, therefore, producers find their expenses exceed receipts. Distributors have large stocks on hand bought at high prices which they must sell at less than the purchase prices. Businesses fail, factories are closed down, and unemployment increases. Investors and lenders are nervous and will provide money only on unquestioned security. In short, all conditions are operating to lessen the volume of credit and to reduce greatly the demand for goods. The result is that prices fall rapidly.

It should be noted that these cycles of increasing and decreasing business activities comprise only one group of influences among the many influences which determine the upward or downward movement of the prices of a particular commodity. Moreover, the influence of the business cycle on prices of different commodities is likely to be unequal. The prices of some commodities are likely to change less rapidly than those of other commodities in the upward movement or in the downward movement.

QUESTIONS ON THE TEXT

1. Why is the formula *demand and supply* alone not a sufficient explanation of prices?
2. What are the three main classes of demanders?
3. What conditions determine the volume of demand by consumers? What is the law of diminishing utility?
4. State the law of demand.
5. What is meant by elastic demand? Illustrate.
6. What are the main classes of sellers? What is the reason that all classes of sellers may not sell more at a higher price than at a lower price, and vice versa?
7. What is the general law of supply?
8. State and illustrate the law which expresses the relationship between price and supply and demand.
9. In what sense may we consider the price determined by the free play

of supply and demand a natural price, and any other price, an unnatural price?

10. Distinguish between fixing prices and discovering prices. Does the retail merchant or local buyer really fix a price? Explain.

11. Does the action of producers affect the prices of some classes of goods? Of all classes of goods? Explain.

12. Why is the farmer unable to adjust supply produced in accordance with changes in prices as promptly as does the manufacturer?

13. Is it necessarily true that the farmer will cease to produce as soon as price falls to less than cost of production? Explain.

14. Does the price of a product tend to equal the cost of production? Explain.

15. "The price of a farm product ought to equal the average cost of production." Criticize.

16. What is meant by marginal cost of production? By bulk-line cost? Illustrate each.

17. How could organized consumers or a monopoly buyer use the principle of bulk-line cost to good advantage in buying? Illustrate by reference to Table 25.

18. How could an association which has a substantial monopoly of production make a larger net return for the total product of its members than it could if competitive price were allowed to prevail? Illustrate by reference to Table 26.

19. Distinguish between the price of a product and its value, and show that the value of a product might remain stationary or even decline while its price was rising.

20. How may index numbers be employed to measure the change in the value of a product?

21. If the value of money increases, what happens to the prices of other commodities?

22. Is there any relation between the quantity of money and credit and the prices of commodities? Explain.

SPECIAL PROBLEMS

1. Make a curve showing the movement of the index number of general prices in the United States from 1896 to date. (Use index numbers published in the Monthly Labor Review, United States Department of Labor.)

2. Using the same source plot the movement of the curve of prices of farm products for the same period.

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CHAPTER XXVI

ECONOMIC COÖPERATION BY FARMERS

I. Some lessons of earlier farmers' movements
II. The need for organization
III. General, or inclusive, community organizations
IV. Coöperation
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    2. Financial conditions of membership

3. Distribution of profits
4. Participation in net resources

VI. Relationships between different forms of coöperative activity

I. Some lessons of earlier farmers' movements. — The history of farmers' movements is rich in lessons which should be heeded by those concerned with farmers' organizations of the present and future. Unfortunately, the tendency to repeat past mistakes indicates that the lessons of the past have not always been duly heeded.

Perhaps the greatest mistake has been the tendency to organize too rapidly. The more important farmers' organizations have sprung up quickly in periods of general discontent. Farmers by thousands have joined them, expecting the impossible. The rapid growth has been the opportunity for loud-mouthed orators to push themselves to the foreground by making impossible promises and developing a gusty enthusiasm that subsides as rapidly as it develops. This sort of leadership is usually incapable of constructive achievement.

Such organizations are likely to collapse as rapidly as they develop. The first breath of discouragement is sufficient to destroy them. The great permanent farmers' organizations of Europe and America have grown slowly from small beginnings. They have not been established in a day by waving a magician's wand.

Not only the farmers' movement but also the experience of organized labor has shown clearly the peril of partisan politics. As far as a farmers' organization is nonpartisan, it can bring pressure to bear on each of the political parties to pass legislation beneficial to farmers, but as soon as it becomes a political party, it is opposed by other existing political organizations. Moreover, its primary purpose is to get in power. To do this it must seek to attract voters by espousing all kinds of issues and must adopt a policy of compromise.

The failure of many of the undertakings of organized farmers has been due to the fact that they have been based on economic fallacies, some of which are considered in other parts of our study. In fact, farmers' organizations have made the serious mistake of not accepting the guidance of experts.

However, if the economist is forced to note the mistakes of farmers' movements, it is only fair to recognize the profound services of those movements to the cause of popular government and the preservation of democracy in America.

II. The need for organization. — At every point the farmer as an individual finds himself compelled to deal with tremendous organized forces that determine the conditions of his prosperity and general well-being. Moreover, since farming is peculiarly adapted to small-scale units of organization, there are many advantages of large-scale organization which can be enjoyed by the farmer only by combining his operations with those of his neighbors. "Here, then, is something as big as 'big business,' as stupendous as Socialism. Yet it is neither. Rather, it is the antidote for both, and this because of the fact that it combines the prime merits of both. It is finding the secret of how to get business efficiency without the social costs in class struggle and human wastage which have characterized industrial development."[1]

III. General, or inclusive, community organizations. — In addition to the various organizations created to meet special needs, a rural community should have one general organization which is the same in extent and in membership as the community. Many of the forms of economic organization do not coincide in scope with the boundaries of a single rural community. Moreover, such a general organization may serve to promote and usher into existence the more specialized forms of organization. It may act as a clearing house for the various matters

[1] Nourse, E. G., "The Agricultural Revolution," *Yale Review* (October, 1918).

of temporary interest not requiring a permanent and specialized organization. It also may be helpful as an agency for crystallizing community opinion on various matters of state and national interest and for the election of delegates to various state and national conventions. However, the most important reason for a general community organization is to widen and deepen rural acquaintanceship and to develop the sense of oneness, of unity of purpose and interest, for " the thought, feeling, and experience of any individual is unavoidably incomplete . . . by looking into one another's eyes and entering into the life and experience of one another through imagination and sympathy the individual more nearly completes himself and more nearly lives the life of the race." [1]

The need for a general and inclusive community organization is met to a certain extent by such general organizations as the Grange, the American Society of Equity, the Farmers' Union, the American Farm Bureau Federation, and the Grain Growers' Associations (Canada). However, some of these organizations are based on the principle of exclusiveness, and perhaps none of them fulfills better the purposes of the general and inclusive community organizations than do the community improvement clubs formed in Wisconsin and to some extent in other states.

IV. Coöperation. — 1. *Definition of coöperation.* — The word " coöperation " is sometimes used in the broad sense of mutual aid. The mutual aid may result from action entered into informally. Of this kind were the old-fashioned log rollings, corn huskings, and barn raisings of pioneer days. While much of this simpler form of mutual aid is still to be found in rural communities, the past half century has seen the development of numerous kinds of permanent and formal organizations, which are more or less different in form, spirit, and purpose from other kinds of industrial organization.

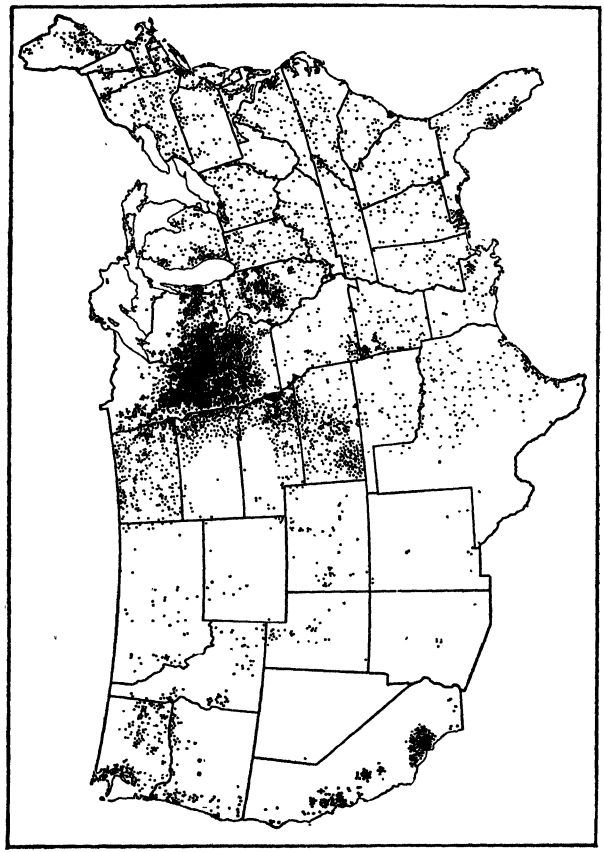
[1] Galpin, C. J., "Rural Social Centers in Wisconsin," *Bulletin 234*, Wisconsin Experiment Station, pp. 7–8.

In this last sense, *coöperative organizations may be defined as formal associations established for the purpose of mutual assistance in the accomplishment of some economic purpose the benefits of which could not be so effectively obtained by the individual members acting separately.*

There has been a tendency to distinguish coöperative associations from other kinds of organizations according to the form of organization. It is true that there are certain forms of organization that may be regarded as typically coöperative — as for instance, the one-man-one-vote principle. However, there are many organizations which are truly coöperative in spirit and purpose although differing little in form from joint-stock companies or corporations.

The fact is that the underlying motives and spirit are more significant than the form. In true coöperation the purpose is not to make profits on capital invested but rather mutual assistance in the achievement of a common aim, in doing something together, as marketing, buying, owning, manufacturing, or borrowing. Consequently, the members benefit according to the degree to which they share in the common achievement — that is, according to the use they make of the organization rather than according to the amount of capital they have invested in it. Moreover, the true coöperative organization is characterized by a spirit of mutual helpfulness and by a spirit of inclusiveness — that is, the members are glad to allow all who have a need of the services of the organization to enjoy its benefits provided they are willing to share the responsibilities of membership.

2. *Classification of coöperative organizations.* — There may be as many different kinds of coöperative enterprises as there are things to be accomplished through mutual association. Without attempting to make an exhaustive classification, some of the kinds of rural coöperative organizations are shown in the following outline:



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FIG. 79.—FARMERS' LOCAL COÖPERATIVE ASSOCIATIONS, 1915 (Each dot represents a single local organization).

I. Credit
   1. Building and loan associations and coöperative housing
   2. Mortgage credit
   3. Coöperative loan banks (short-time credit)

II. Coöperative colonization and settlement associations

III. Coöperative associations for supply and consumption
   1. Coöperative purchasing associations
   2. Coöperative retail and wholesale stores
   3. Coöperative manufacture for rural consumption, *e.g.* coöperative implement factories or saw mills
   4. Coöperative meat clubs, beef "rings," etc.
   5. Coöperative telephones
   6. Coöperative medical service
   7. Coöperative laundries, coöperative power, electric light, and water supply associations

IV. Coöperative insurance — life, fire, live stock, hail, etc.

V. Coöperative agricultural production
   1. Joint ownership
      a. Ownership of machinery, coöperative scales, etc.
      b. Stallion associations, etc.
   2. Joint production
      a. Creameries and cheese factories
      b. Bacon factories and abattoirs
      c. Gins
      d. Canning factories
      e. Collective ownership and operation of farms, such as Italian *affitanzi* and Roumanian *obstei*
   3. Joint storage and sale
      a. Elevators
      b. Storage warehouses — *e.g.* cotton
      c. Live-stock shippers' associations, vegetable and fruit marketing associations, cotton marketing associations, etc.
   4. Joint regulation of industry
      a. Coöperative breeders' associations
      b. Live-stock associations
      c. Horticultural and crop associations
      d. Growers' associations — *e.g.* cotton growers, corn growers
      e. Seed-improvement associations
      f. Cow-testing associations

VI. General community improvement associations

3. *Conditions of successful coöperation.* — Experience has demonstrated certain conditions which are favorable to successful coöperation.

a. Born of necessity. — Writers on coöperation have frequently asserted that successful coöperation is born of necessity. In fact, coöperation has developed largely among small farmers, the economically weak. It is important that there be a considerable and continuous advantage to be derived from the coöperative activity. Too often the advantage to be gained is grossly exaggerated by the enthusiastic propagandist, and the coöperators, discouraged and disillusioned, abandon an enterprise which if continued might have led to considerable benefits.

b. Favorable characteristics of the population. — Important differences in nationality, language, and sometimes in religion may prove to be conditions unfavorable to success. For the same reason it is usually best that there be no extreme differences in the relative financial ability of the coöperators. However, this is not so important a condition when the principle of limited liability is employed. Finally, the population should be stable. Sometimes tenants make poor coöperators because they are not sufficiently permanent in the community.

c. Sufficient amount of business. — Sometimes there is not enough business available within a convenient distance to justify economical coöperation. For instance, there may not be a sufficient number of cows for a successful creamery.

d. Compact territory. — It is also important that the area be small enough so that all the coöperators may know one another. This is especially important in associations for coöperative credit.

e. Character of the enterprise. — It is usually unsafe for farmers to undertake a business that is too complex in character or that is too far removed from the general experience of farmers. This is a world in which division of occupation and

specialization make for efficiency. Moreover, a single coöperative enterprise should not undertake too many lines of endeavor. There should be unity of aim. To undertake a considerable number of enterprises makes too great demands on the limited time and attention of the members.

f. A favorable coöperative law. — It is of great importance that coöperative associations be authorized by suitable legislation. In about two fifths of the American states there are no special coöperative laws as distinguished from the law of corporations. The word "coöperation" should be legally employed only by enterprises which clearly conform to accepted principles of coöperation as defined specifically in the coöperative law of the state.[1]

It is of the highest importance to the progress of the American farmer that the combination of local agricultural associations into larger organizations should be rendered legal both in federal and in state laws. The only danger is that a combination may become an oppressive monopoly. This danger should be eliminated by regulation. Various measures designed to provide for this need have been considered by Congress, and in 1922 an act known as the Capper-Volstead Bill was passed. This act legalizes the activities of agricultural coöperative associations so far as concerns interstate and foreign commerce. Safeguards are provided to prevent the monopolistic abuse of these privileges. The act does not apply to coöperative supply associations.

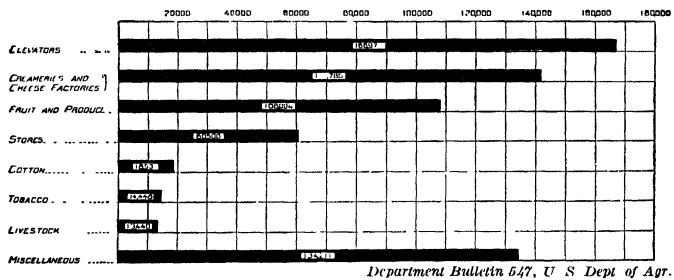
4. *Policies to be followed by coöperative organizations.* — Experience has indicated certain policies which should be observed by a coöperative organization if it is to be successful.

a. Membership confined to farmers. — It is usually a safe rule that only persons actually engaged in farming shall be

[1] For classified analysis of existing coöperative laws in American states and suggestion for a model law, see *Service and Regulatory Announcement No. 20*, United States Department of Agriculture, February 7, 1917.

members of farmers' coöperative organizations. Membership drawn from other classes is likely to give rise to a conflict of interest.

b. Nonexclusive in policy. — The organization should not be exclusive within the class which it seeks to serve. An organization which seeks to confine its advantages only to a few fortunate "insiders" has lost the spirit of coöperation. It follows from this that the cost of membership should not be too high for the ordinary farmer.



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FIG. 80. — MEMBERSHIP OF VARIOUS CLASSES OF COOPERATIVE ORGANIZATIONS, 1913

Membership of all cooperative organizations reporting to Office of Market and Rural Organization, 1915.

c. Spirit of coöperation. — Coöperators should be willing to make sacrifices because they believe in coöperation as a salutary principle for their community and for mankind as a whole. Yet, it is not well to rely on idealism and altruism alone. Unless clear-cut and adequate benefits and advantages are in prospect the organization is not likely to be permanent.

d. Importance of loyalty. — Many coöperative elevators, creameries, and stores have failed because individual members allowed themselves to be enticed by slightly higher prices offered by competing privately owned concerns with deliberate intention to kill the farmers' organizations.

A number of methods have been used to compel loyalty. Sometimes a by-law of the association provides that a member who takes his business away from his own organization shall pay a certain amount on each unit of business transferred. However, the courts in certain states have refused to uphold this method. Another method is to require members to sign an agreement to give all their business to the association on penalty of loss of membership. Such a method, however, is likely to be effective only if the benefits conferred by the association are so great as to be highly prized. A still more effective method is to require a member to give bond in the form of a collateral security note to be forfeited as "liquidated damages" in case of violation of contract.

e. A good manager. — Farmers are inclined to underestimate the importance of business experience and technical knowledge. One of the most frequent mistakes has been a stingy policy in the payment of salaries. Frequently such a policy proves to be "penny wise, pound foolish."

Farmers have frequently made the mistake of entrusting the management of their business enterprises to those who have promoted the enterprise or organization. It is perhaps usually true that the effective promoter lacks the constructive ability and business experience necessary to make a success of the enterprise.

f. Democratic government. — A coöperative organization should be democratic in government. The extreme form of this is the one-man-one-vote rule. In some states where there is no special coöperative law and where the association must be organized as a corporation with capital stock, it may not be possible to prevent voting according to number of shares owned by each member. Sometimes the difficulty may be partly avoided by restricting the number of shares that may be owned by any one person and giving the organization first right to purchase the shares of a member before they are offered to any one else.

Sometimes when a very small percentage of the members furnish the greater part of the capital or business, it may be necessary to make special concessions to the important minority in the matter of voting. One method sometimes used is to allow each member a number of votes in proportion to the amount of business which he transacts through the association.

Democratic government is not inconsistent with centralized management, and the latter is usually necessary for efficiency. Generally speaking, the membership should choose the board of directors and leave to them the determination of general policies, retaining the power of veto through provision for referendum.

g. Businesslike methods and adequate system of accounting. — It is especially important that coöperative associations employ systematic and businesslike methods, for such methods inspire confidence. It is particularly necessary that the system of accounting be complete enough to furnish all financial information needed to make possible a sound business policy.

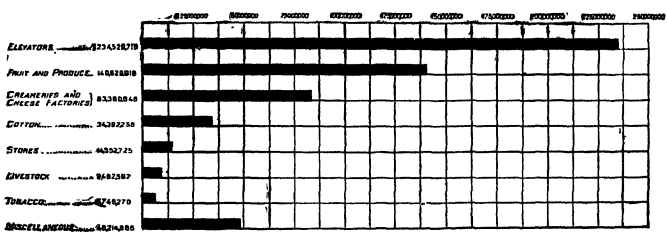
Recently the United States Department of Agriculture has been employing some of its experts in the study of suitable accounting systems for particular kinds of coöperative organizations.

h. Avoidance of speculation. — It is highly important that coöperative associations avoid speculation. Unless all the members agree to the speculative policy, some are subjected unwillingly to an unnecessary risk.

i. Importance of cash business. — Closely akin to the above principle and almost equally important is the necessity of avoiding occasional sales to members or purchases for members on credit. Since the officers of the association are chosen by the members, it is difficult for them to refuse credit to members, for granting credit to one and refusing it to another is certain to result in disagreements. However, when a coöperative supply association is designed primarily for the purpose of

providing supplies on credit, the above conclusion need not apply.

j. Advantages of federation. — We should not leave the subject without suggesting the importance of uniting a number of local associations in a union for the realization of their common aims. Such combinations enjoy many of the advantages which ordinary businesses derive from large-scale organization. They may buy, sell, and transport goods in large quantities and, consequently, with the greatest economy; employ experts in buying, selling, and manufacturing; standardize their products; build up good will; and open new markets. Their



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FIG. 81. — VOLUME OF BUSINESS OF VARIOUS CLASSES OF COÖPERATIVE ORGANIZATIONS, 1913

large size commands the respectful consideration of their claims on the part of politicians, railway companies, and other large businesses. Each local association may benefit by the common experience of all the other local associations within the federation. A group of trained officers and employees may be developed for the supply of local associations. Methods of organization, operation, and accounting may be standardized so that a local association no longer has to start amid uncertainties and learn by hard experience with imminent risks of failure. The central organization can provide experts to investigate carefully the desirability of forming the new association.

Broadly speaking, experience has shown that the natural order of development is the combination of locals into larger organizations by federation, rather than by the establishment first of the general organization and the development by the general organization of the primary, or local, associations. After the federation is firmly established, it may in turn become a factor in the establishment of locals, encouraging their promotion when conditions are favorable to their success, giving them the benefit of the general experience in getting started, providing systems of accounting, and suggesting trained employees.

Local associations should retain their self-government and the right to manage their own affairs, surrendering to the central organization only those powers necessary to enable it to serve the common interests of all, for the vitality of the central organization is in the local associations.

V. Financial policies of coöperative organizations. — 1. *Raising of capital.* — In the present discussion we shall consider the possible financial policies that may be followed, on the assumption that they are not already provided for in state law.

If any association is formed as a joint-stock company, it may raise capital by the sale of shares. If a greater amount is needed than can be raised in this way, the organization may resort to borrowing. Individual shares should have a small par value, and they should be sold to members at not less than par. Since the success of a coöperative association is likely to be promoted by having a large number of members, it is important to distribute ownership of stock as widely as possible.

The principal precautions to prevent the association from losing its coöperative character are limitation of voting power and limitation of dividends on stock. A possible alternative is to issue stock to members in proportion to the amount of business carried on through the association, although there are certain serious disadvantages in this method.

If an association cannot provide a sufficient amount of capital by selling stock to members, it may borrow. Its ability to borrow as an association is likely to be increased if the members have some personal liability — as, for instance, double the amount of stock which they own.

There are many forms of coöperation which do not require much capital or which can accumulate the small amount that may be desirable by membership dues and the setting aside of a reserve out of earnings, as, for instance, cow-testing associations, live-stock shipping associations, simple supply associations, the simpler forms of breeders' associations and growers' associations, and others.

2. *Financial conditions of membership.* — It may be possible to have two methods of becoming a member: one, by the purchase of stock subject to the restrictions on purchase imposed by the association, and another, by election to membership subject to the payment of an entrance fee. This method may be used by associations which limit the dividends payable on stock; but in many states a special coöperative law is required to give it legality. Moreover, it is unnecessary if the shares of stock are of sufficiently small denomination so that any person desiring membership can readily purchase a share. The entrance of new members may be still further promoted by permitting the payment for stock on installments, crediting the purchaser with dividends, less the interest on the deferred payments.

Mutual associations need not encounter the above difficulties in regulating membership, for new members are admitted on the consent of the association through election.

3. *Distribution of profits.* — If a coöperative association pursues a conservative policy of accounting, it will include in expenses an adequate allowance for repairs and depreciation as well as premiums on all insurable risks. Consequently, these payments and charges will have been deducted before

the profits are determined. However, there are other elements of risk which cannot be insured or foreseen. Therefore, it is desirable for an association to accumulate a reserve fund. The sinking fund is another allowance that may be set aside out of profits before dividends are declared. This is a fund which is accumulated to pay off a debt that the association has incurred.

Some associations set aside out of profits a small sum for teaching coöperation, and this is required in the coöperative laws of certain states.

After the various allowances from profits have been made, the remaining earnings may be divided among the coöperators. If the coöperative association is in form an unmodified joint-stock company or corporation, dividends may be distributed according to the shares of stock owned. If the stock is fairly well distributed among those who patronize the association, or better still, if there is some proportion between the amount of stock owned and the amount of patronage furnished by the stockholder, coöperative principles may be approximately realized.

Without doubt associations organized on the unmodified joint-stock plan are in danger of becoming selfish and exclusive. The few stockholders may seek to control the association in their own interests, paying low prices for grain or cream and giving none of the benefits to the patrons. To avoid this danger, provision may be made in the corporation or association to limit dividends on capital stock to a certain per cent of the par value of the stock. The remaining profits are distributed to those who have patronized the association, whether stockholders or others, in proportion to the business they have furnished the organization. In the case of mutual associations, of course, there is no stock to receive dividends. Consequently, the only kind of dividend will be the patronage dividend. However, it is sometimes found desirable to make some distinction between members and nonmembers. It is hardly fair that

those who bear none of the risks, trouble, and responsibility of the organization shall receive as great benefits as those who bear these burdens, for there would be no inducement to membership. It is obvious, therefore, that the success of a coöperative association may not always be measured by the amount of dividends paid. Thus creameries or elevators might pay low prices for products furnished in order to pay high dividends. Coöperative stores might show high profits by charging members high prices for goods. On the other hand, a coöperative elevator may pay high prices for grain, forcing its competitors to do the same and raising the general level of prices received by farmers for grain. Even if it pays no dividends, it has provided a substantial benefit.

Generally, however, coöperative associations find it desirable to buy and sell, so far as concerns their dealings with members, at prevailing market prices.

4. *Participation in net resources.* — The question of participation in net resources may give no trouble except when the association is dissolved and it becomes necessary to divide up the property that is left after debts are settled. In the case of an association formed as an ordinary corporation, the stockholders, of course, are entitled to share in the net resources in proportion to the number of shares owned by each. In associations without capital stock the problem is more difficult. Generally speaking, the property has been paid for by all who have patronized the association, for it has been made possible by the deduction from current receipts or by setting aside money from reserve funds and sinking funds. In Denmark mutual creamery associations have avoided this difficulty by borrowing the whole capital, paying it off by deductions from cream checks, and then reborrowing. As a result, the patrons pay off the total value of the capital out of their cream checks in a relatively short period of time and in proportion to the use made of the association.

VI. Relationships between different forms of coöperative activity. — There are certain forms of coöperation which are so closely related that they frequently may be successfully combined in the same association. For instance, cow-testing associations, live-stock breeding associations, and live-stock shipping associations are so closely related that they may be profitably combined, and it may be practicable to add a coöperative creamery or cheese factory. However, it would be unsafe to undertake all of these lines of endeavor at the beginning.

Marketing associations not infrequently operate a supply department for the purchase of various requirements for growing and marketing the product, such as crates, boxes, fertilizers, spraying materials, and similar commodities. Coöperative grain elevator associations are especially likely to engage in coöperative supply. Likewise, supply associations sometimes undertake the sale of members' products. In Germany, Italy, and some other European countries, the coöperative credit bank has generally been the nucleus about which other forms of coöperation have developed. Coöperative canning factories are sometimes connected with fruit and vegetable associations for the purpose of using unsalable products. However, a recent study of coöperative canning factories in America shows that when a canning factory depends for materials merely on the unsalable products of a marketing association, its supply of materials is likely to be too irregular for economical operation.[1]

Growers' associations are likely to be connected with marketing and storage associations. In fact, a growers' association is more likely to develop out of a marketing association than it is to develop independently, for the attempt to market coöperatively is likely to emphasize the necessity for standardization of product.

Sometimes creameries are used as centers about which are

[1] *Yearbook* for 1916, United States Department of Agriculture.

grouped other coöperative activities. In Saskatchewan, creameries are centers for poultry fattening, because skim milk is used for that purpose. In a number of European villages the creamery is a center for coöperative power associations to furnish electricity to farmers and, in some cases, for the operation of a coöperative laundry.

QUESTIONS ON THE TEXT

1. What are some of the principal lessons to be derived from the history of farmers' movements?
2. Why are general and inclusive rural organizations needed in addition to special kinds of coöperative organizations?
3. Define cooperation. How would you distinguish a cooperative organization from an ordinary corporation?
4. Give the principal classes of coöperative organizations.
5. Mention and explain six conditions favorable to the success of coöperative organizations.
6. Mention and explain ten different policies which may be considered favorable to the success of coöperative organizations.
7. Discuss the methods of raising the capital of cooperative organizations in relation to the policy to be followed with respect to the financial conditions of membership.
8. Discuss the policies of coöperative organizations in the distribution of profits.
9. How do the members participate in the resources of coöperative organizations?
10. Discuss the relationships between different forms of coöperative activity.

SPECIAL PROBLEMS

1. Write an account of the development of the Granger movement, indicating the causes of the rise of the movement and also of its sudden decline in the seventies.
2. Write an essay on the rise of the Farmers' Alliance, outlining the principal policies advocated in the movement.
3. Describe the system of organization and characteristic policies of one of the following farmers' organizations: The Farmers' Union, American Society of Equity, American Farm Bureau Federation.
4. Give an account of the farmers' clubs of Wisconsin.

5. Prepare a detailed plan of organization and operation of one of the following kinds of coöperative organizations: (*a*) creamery, (*b*) breeding association, (*c*) mutual fire insurance, (*d*) corn growers' association, (*e*) coöperative bull association, (*f*) cow-testing association, (*g*) machinery association, (*h*) coöperative supply association, (*i*) coöperative store.

6. Write an essay describing the provisions of the Capper-Volstead Act, which legalizes the activities of farmers' coöperative organizations, as far as it applies to interstate and foreign commerce. (See *Bulletin 1106*, United States Department of Agriculture.)

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