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# REPORT OF THE CHIEF OF THE BUREAU OF AGRICULTURAL ECONOMICS

UNITED STATES DEPARTMENT OF AGRICULTURE,  
BUREAU OF AGRICULTURAL ECONOMICS,  
*Washington, D. C., August 31, 1927.*

SIR: I have the honor to transmit herewith a report of the work of the Bureau of Agricultural Economics for the fiscal year ended June 30, 1927.

Respectfully,

LLOYD S. TENNY,  
*Chief of Bureau.*

HON. W. M. JARDINE,  
*Secretary of Agriculture.*

The work of the Bureau of Agricultural Economics during the past year has been marked by more vital cooperation between this bureau and other agencies throughout the country which are dealing with the economic problems of agriculture. This cooperation covers a wide range of activities from the dissemination of information on market supplies and prices of farm products to the study of the taxation problems. It is carried on under diverse arrangements, from the formal cooperative agreement for the joint prosecution of a research project to the informal conference with a small group of farmers. Many individuals render valuable service through cooperation with this bureau. For example, more than 300,000 farmers furnish information with regard to crop conditions, and a large number keep farm records and accounts in accordance with the recommendations of the business specialists of this bureau and submit valuable data on farm operations and farm-management practices. The close association of individuals and agricultural agencies with this bureau has made possible more concentrated work on local conditions and more effective dissemination of information connected with farm problems.

Great impetus was given to cooperative marketing work by the passage on

July 2, 1926, of an act creating a division of cooperative marketing in this bureau. This division is now well organized, having a corps of able specialists who are not only thoroughly familiar with the principles of cooperative marketing but are in addition experienced in the production, handling, and marketing of farm products. These men are in constant touch with cooperative managers and directors in working out methods by which cooperative marketing and purchasing by farmers can be made more effective. Farmers are increasing their demands for information leading to better production, better grading and standardizing of products, improved marketing methods, and skillful administration of the market supply in connection with their cooperative activities. This attitude on the part of farmers promises much for the future of cooperative organization. Through the Division of Cooperative Marketing, all of the facilities of the bureau are drawn upon to furnish information which is helpful to farmers in successfully meeting their organization and production and marketing problems.

A study of receipts and expenditures for the agricultural industry as a whole indicated that for 1926-27 there was a decline in net agricultural income of approximately 20 per cent,

whereas in the preceding four years there had been successive improvements from the low levels of 1921-22. There was a decline of approximately 5 per cent in gross income, while the expenses of production declined only 2 per cent. The reduction in gross income from agricultural production appears to have been almost entirely a reduction in cash income from sales. When analyzed by groups of commodities, the decline in cash income appears to be due largely to the smaller incomes from the record cotton crop, from grain crops, and from apples and potatoes. Somewhat higher receipts from livestock and livestock products only partially offset the lower incomes from crops.

A special study covering returns made by 13,475 farmers in the United States indicated that after taking into account changes in inventory, the average receipts exceeded expenses by \$1,113 in 1926 as compared with \$1,297 in 1925. It should be noted that a wide variation is shown in the incomes of individual farmers. While many operated at a satisfactory profit, the receipts on over 11 per cent of the farms in 1926 were not sufficient to cover expenses, after taking into account changes in inventory.

Continuous attention has been given by the bureau to lines of work designed to aid farmers and their organizations in finding ways of improving the unsatisfactory farm conditions. A special effort has been made to provide farmers with information essential in adjusting their production programs to meet the changing demand for farm products. It is desirable for farmers to decide the amount and kinds of commodities which they will produce in the light of all available information with regard to supplies of farm products on hand, forecasts of intentions of farmers throughout the United States to produce similar commodities, information with regard to the production of these commodities in foreign countries, and estimates of the probable demand for them at the time when they will reach the market. Farmers should be prepared to change their farm enterprises in order to meet changing economic conditions.

It is to help the farmers in making advantageous shifts in their production that the outlook reports are prepared in this bureau. Each year all available information in every division of the bureau is brought together and used in outlining the situation with regard to each of the major farm crops.

The report points out the probable future trends of demand and supplies of agricultural products. It takes into consideration and presents the facts on world-wide and national conditions which farmers should consider along with their local conditions in planning their year's production. This report is issued in January or February of each year, so as to give farmers time to make adjustments.

Supplementing this outlook report surveys are made and reports issued just previous to planting time for various crops of the intention of farmers to plant. Twice annually the pig survey is made which shows the intentions to breed pigs. These reports are sent out, not as forecasts of probable production but as statements of farmers' intentions as of a certain date. They furnish producers an opportunity to modify their plans if it appears desirable. It is well known that progressive farmers do modify their programs in the light of the information indicated by these surveys. A beginning has been made in cooperation with various States to supplement the national outlook work by local information which will be of particular value to farmers in the State in readjusting their plans.

Intensive research work must be done and searching analyses made of the factors which influence the prices for farm products. Special studies have been made of oats, cotton, and hog prices that have been especially useful to students of economic conditions and agricultural workers.

Coordinate with the work of helping to adjust production to meet changing demands, the market information service is carried on to help the farmer in disposing to the best advantage of the products which he has produced. Comprehensive reports are issued monthly covering the major farm products and dealing with current and prospective conditions as to demand, supplies, and prices in domestic and foreign markets. The market news service furnishes producers, distributors, and others with daily and often hourly information with regard to prices on the principal markets, supplies arriving at central markets, cars which are en route, demand, and general developments in the various market centers. This service is now well recognized and has developed to a point where it is indispensable to the intelligent marketing of farm products and therefore a very important factor in the Nation's commercial life. Through

the cooperation of the radio-broadcasting stations "up-to-the-minute" market information is available to practically all farmers.

Another service which is of growing importance to agricultural interests is the market inspection of farm products. This service is offered at both shipping and receiving point for many products. This work has greatly facilitated marketing, in that it furnishes reports on the quality and condition of shipments which are accepted by all parties to a transaction as fair and unbiased statements of the actual facts. The service has gone far toward establishing confidence, settling disputes out of court, and preventing waste of commodities which are involved in controversies.

A new development, which has already attained popularity, has been the inauguration of an experimental meat grading and stamping service. Under this service the grade is stamped on the carcass inspected with a roller stamp in such a way that the grade designation appears on the retail cuts. Consumers can consequently see the grade of the meat which is being purchased. This experiment was taken up at the urgent request of livestock producers and others as a means of promoting the production of superior beef and in order that the producers of high-grade beef might receive the premium which is due to superior products.

Marked interest has been shown during the past year in the bureau's program of standardization. The standards promulgated or recommended by this bureau have been made the legal standards in a large number of States, and cooperative organizations have adopted the standards as a basis for pooling their products. The shipping-point inspection work of this bureau has hastened the adoption and use of uniform standards by producers and shippers, who are realizing more and more the value of marketing their products on the basis of well-recognized grades. The second Pan American standardization conference, which was held in Washington May 9, 1927, strongly indorsed the standardization work of this bureau. Great interest has been shown in the various standards, and requests have been received for descriptions and practical forms of the standards from many foreign countries. Standards for various commodities are of increasing importance in connection with the exporting of American farm products.

In addition to controlling the production programs and improving mar-

keting facilities the farmer must have means of carrying his products until a suitable market can be found. As a means of accomplishing this, the work under the Federal warehouse act has been of great assistance. The work of inspecting and licensing warehouses for the storage of farm products has had a marked growth during the last five years. Twelve products are now eligible for storage under this act and the number of warehouses applying for licenses is steadily growing. Paper representing products stored in federally licensed warehouses is readily acceptable as collateral for loans and furnishes the credit needed by farmers in carrying their products until such time as they can be sold to the best advantage.

### PRODUCE AGENCY ACT

The produce agency act (44 Stat. 1355), approved March 3, 1927, makes it a misdemeanor, after June 30, 1927, for any person or firm receiving perishable farm produce in interstate commerce, or in the District of Columbia, for or on behalf of another, to make any false report or statement to the person from whom the produce was received, knowingly or with intent to defraud, concerning the handling, condition, quality, quantity, sale, or other disposition of the produce, or, knowingly and with intent to defraud, to fail truly and correctly to account therefor, or to dump or destroy produce without good and sufficient cause. Regulations for the enforcement of the produce agency act have been promulgated by the Secretary of Agriculture in Service and Regulatory Announcements No. 107 (Agricultural Economics). In view of the passage of this act, the proposed standard trading rules agreements which had been entered into by a large number of members of the fresh fruit and vegetable trade have been held in abeyance.

### DIVISION OF FARM MANAGEMENT AND COSTS

H. R. TOLLEY, *in charge*

The difficulties experienced by farmers during the agricultural depression of the past six years have emphasized the importance of the adjustments in farming systems and practices which farmers must make as economic conditions change. Violent fluctuations in prices have centered attention upon this factor as one of the elements which farmers must take into account

from time to time in making their plans. Significant shifts in the demand for many farm products and the development of new production areas for others have focused the farmer's attention upon the necessity for frequent reorganization of farm programs in order to meet changing conditions. For this reason the more recent farm-management studies have pointed out the adjustments which farmers should make from time to time in order to keep their farming methods and practices and their production programs in line with the market requirements for the various products. The work of this division serves as a medium through which the bureau's various lines of economic information are focused upon the individual farmer's problem of what to produce so as to obtain the greatest profit. Information relating to market requirements, present and prospective demand and prices, production trends in competing regions, and production costs, methods, and practices are interpreted in the light of the conditions and factors governing successful farming in particular farming regions in such a way as to assist individual farmers and groups of farmers in determining sound production programs for their farms.

Partly as a result of the increasing commercialization of agriculture, the problem of regional competition between the farmers of different producing areas has taken on added significance in the past decade. For this reason a regional study of many farm-management problems centering around particular commodities or types of farming is necessary. The Federal department is peculiarly fitted to assume the initiative in work of this type, which, however, is carried on most effectively in cooperation with interested agencies in the various States. The more recent work of this division includes a number of projects of this type; for example, the studies of the apple industry, the peach industry, the combine harvester-thresher in the Great Plains region, and the use of the cotton sled and other large-scale methods of cotton production in the western part of the Cotton Belt.

#### STATE AND LOCAL AGRICULTURAL PROGRAMS

A detailed study of the agriculture of Idaho carried on in cooperation with the experiment station and other local agencies has been completed. Attention was called to the increasing demand for dairy products in far west-

ern markets within convenient shipping distance of Idaho producers. The marked increase in dairy production in the different sections of the State was also pointed out. Similar information relative to the market demand for each product grown in the State, prices, price trends, and price outlook, production in competing areas, farm-management problems and practices were assembled and analyzed. This information was presented to farmers in a series of reports and through the regular extension service. Assistance was given in the conduct of similar studies in the area around Billings, Mont., and in the territory adjacent to Columbia, S. C.

#### TYPES OF FARMING

Studies of the geographical distribution of types of farming have been continued. In these studies the agricultural census data for each county in each State is analyzed for the purpose of locating areas having similar types of farming. In this way the results of farm-management studies in particular localities may be used in the larger type of farming area of which the locality studied is typical. The changes in type of farming from one census period to the other are also analyzed with a view to determining the factors responsible for these changes.

In North Dakota, in cooperation with the agricultural experiment station, census and crop-estimates data as to crops and livestock in each county were analyzed and the State was divided into 13 types of farming areas. Typical farming systems in each of these areas were determined from a special analysis of records on several thousand farms located in these various areas. This comprehensive picture of the important types of farming carried on in each important section of the State aids in the development of sound educational programs which take into account the physical and economic conditions which affect farmers' decisions as to what crops and livestock they can produce to best advantage. Similar studies are being conducted in cooperation with the experiment stations in Oklahoma, Kansas, and South Dakota.

#### FARM RECORDS AND ACCOUNTS

Studies of farm organization and management problems by means of farm records and accounts were continued in selected areas in which changing economic conditions are mak-

ing adjustments necessary in the farming systems. In these areas a carefully selected group of farmers keep closely supervised records over a period of from one to three years. These accounting data are used, in connection with experimental data, price data, and other related information, in determining the advantages and disadvantages of the different systems of farming being followed and the possibilities of the new lines of production and the new systems being tried in the area. An important function of the accounting data in these studies is to aid in localizing and adapting data available from other sources.

Bulletins have been prepared showing the results of these studies in a beef-cattle section of southwestern Virginia, a dark-tobacco section of western Kentucky, a crop and livestock section of southeastern South Dakota, and the irrigated section of northern Colorado. The ways in which different farmers are meeting the new conditions are described in detail in these reports and illustrations, showing methods, practices, and systems that were profitable during the period of the study and conclusions based upon the record data, experimental data, and the best available information from other sources as to the enterprise combinations that are likely to prove profitable during the years just ahead are presented. A bulletin on farm budgeting was prepared during the year outlining a method of procedure for farmers in organizing and using accounting data, experimental data, price data, and related information in working out solutions to particular farm problems.

New studies were started in a cotton and garden-truck section in southeastern Mississippi, a dairy section of southwestern Illinois, and in the dairy section around Richmond, Va. Wherever studies of this kind show that widespread adjustments are advisable for an area, interested farmers are assisted in working out new systems and in keeping records on these new systems. In each of these areas a selected group of farmers was assisted in working out and putting into operation such changes as appeared desirable in the light of the previous studies and conditions on the farms. The results of these studies are being used more and more by extension agents as a basis for sound extension programs and policies.

#### LOCAL APPLICATION OF OUTLOOK INFORMATION

A beginning was made in aiding States in the local interpretation and

application of the outlook information prepared by the bureau. Local agencies were aided in outlining the additional information which farmers need in making profitable adjustments in their farm enterprises. Arrangements were made in a number of States for developing more of the background information needed in providing farmers with reliable current information on which to make their production plans. Particular attention is given to the farm-management problems involved in adjusting crop and livestock production on individual farms in response to changes in market and price conditions.

#### THE APPLE INDUSTRY

At the request of producers' organizations and others, a study of the apple industry was started during the year in cooperation with other divisions of the bureau and with State experiment stations and extension services. Statistics relating to the ages and varieties of trees in commercial orchards were obtained for all the important apple-producing sections. Analysis of these data will indicate the trend of production of important varieties in each section of the country during the next 10 or 15 years. Studies of the prices received by growers for apples of different varieties, sizes, and grades were made, and information on the supply of apples and on the demand for apples of different varieties, grades, and sizes was collected in a large number of representative cities. Studies of the place of orcharding in the farming systems of specific areas were made in five States and this work will be expanded during the coming year. All the various phases of the investigation, including the analysis of markets, competition between areas and varieties, trends in production and plantings by varieties, present and prospective price levels, production costs and practices, yields, and similar information will be interpreted and presented with a view to enabling the producers of different sections to make a better adaptation of production to market requirements. In the Cumberland-Shenandoah region of Pennsylvania, Maryland, Virginia, and West Virginia a study of the factors affecting the yield of apples has been made in cooperation with other bureaus and the State experiment stations.

#### THE PEACH INDUSTRY

The studies of the peach industry initiated during the previous year were completed and the results presented

to peach producers and distributors. Reports dealing with the peach industry in their respective States, based in part upon the information collected by the bureau in this study, were issued by 10 States. A circular dealing with the peach situation in the Southeastern States was prepared. This study revealed the fact that the number of bearing peach trees in southern commercial peach States has increased rapidly during recent years and that the indications are for further increases during the next few years. It was also found that competition on the markets is likely to be keen on account of increased production capacity of peach trees in some sections and increased plantings in others, and also on account of increasing competition from other fruits and melons. Possibilities of increasing net profits by improved cultural practices and strict grading were pointed out. The desirability of a more even flow of peaches to the market through a better control of distribution was also indicated by this study.

#### STUDIES OF COMBINE HARVESTER-THRESHER OPERATIONS

To determine the practicability and efficiency of the combine harvester-thresher in the Great Plains, a study was made of combine operations in selected districts in Texas, Oklahoma, Kansas, Nebraska, and Montana, and records were obtained from farmers who operated these machines during the harvest season of 1926.

In all of the districts where records were obtained the farmers who were using combines were unanimous in stating that the combine is a practical and efficient harvesting machine. It was found that the combine has reduced the cost of harvesting and threshing, the labor required for harvest is reduced, the cost of twine for binding and the cost of threshing is eliminated, the period of harvest and threshing is shortened, so that the work of preparing the fields for the following crop can be done in better season, and there is probably less waste under this method.

The expense of harvesting small acreages with a combine is greater than for either a binder or header. Where 75 or more acres are to be harvested, however, the small combine may prove more economical than other machines. The large combine may be more economical than a binder or header if more than 100 acres are to be cut. Where 300 or more acres are to be cut the fixed charges of the

combine are reduced to a low figure and the combine reaches its highest efficiency.

A somewhat similar study was made in cooperation with the Bureaus of Plant Industry and Public Roads and with agricultural colleges in various States for the purpose of determining the advantages and disadvantages of harvesting grain sorghums by different methods. It was found that the losses from heads left in the field were much greater when combines were used than where grain headers were used. Grain sorghums harvested with combines were found to contain more moisture, foreign material, cracked grain, sand, and dirt than sorghums that were headed and then threshed. On the other hand the actual cash or out-of-pocket costs of harvesting grain sorghums with combines were found to be much less than with headers or binders. The results of this study indicate the method of harvesting grain sorghums that are most advisable under various circumstances.

#### FARMING ADJUSTMENTS IN MARKET HAY AREAS

A study of the problem encountered by the farmers in the hay-producing areas of Pennsylvania and New York was made. Data showing the consumption of hay by horses and mules in the cities and mines of northeastern United States indicate a declining demand for the market hay grown in these areas. Similar data relative to the trends in acreage production and shipments of hay from the various areas supplying these markets have been assembled. A field study of the requirements for hay production and of the production possibilities and returns from alternative enterprises was made in the important hay-producing areas of these two States. It is expected that these studies will make possible sound recommendations for profitable farming adjustments in these areas.

#### HARVESTING METHODS IN WESTERN COTTON BELT

Because of the marked increase in the use of the cotton sled in harvesting cotton, a study was made of the requirements and costs for picking, snapping, and sledding cotton in western Texas and Oklahoma. The possibilities of using the sled elsewhere and the outstanding advantages and disadvantages of harvesting cotton with the sled as compared with harvesting by picking or snapping were pointed out. It was found that only six or seven hours of man labor are required to sled



enough cotton to make a 500-pound bale of lint, whereas 70 or 80 hours are required for hand picking that quantity. On the other hand, cotton which has been sledged or snapped sells at a disadvantage as compared with that which has been picked, and even under favorable circumstances the sled leaves some cotton in the field.

Special studies of large-scale cotton farming were made in the Corpus Christi and San Angelo areas of Texas. The effect of the use of large-scale production methods on the organization of cotton farms in this area and upon the incomes obtained by farmers were indicated by this study.

#### REORGANIZATION OF VIRGINIA TOBACCO FARMS

The development of improved farming plans on tobacco farms of south central Virginia was continued in cooperation with the Virginia Polytechnic Institute. This work is an outgrowth of a two-year study of the cost of producing tobacco and of farm organization in this area and the results have been gratifying on most of the farms.

#### COST OF PRODUCING STAPLE CROPS

A study of the cost of producing corn, wheat, oats, cotton, and potatoes was continued along lines similar to the studies of previous years. Reports from 15,000 farmers were received and analyzed in connection with these studies. Bulletins on the costs of producing wheat, incomes from farming and the cost of using tractors, horses, and combines on wheat farms in Sherman County, Oreg., and on the cost of producing Virginia dark and light tobacco were issued. The necessity for the expansion of enterprises other than tobacco as well as the improvement of farming practices as a basis for increasing farm earnings in this area was emphasized.

#### LIVESTOCK IN THE SOUTHERN COASTAL PLAINS REGION

The study of the place of livestock in the agriculture of the southern coastal plains region which was made in cooperation with four Southern States assumed added significance because of the rapid decline in cotton prices in the fall of 1926 and the increased interest in livestock production in this region. Methods of handling livestock on successful and unsuccessful farms were studied in detail and reasonable standards of care and management set up as guides for livestock producers in these areas.

In the black prairie belt of Alabama and Mississippi it was found that because of the natural adaptability of the soil to the production of forage crops and the possibility of sufficient good pasture, the production of livestock offers an excellent means of more fully utilizing the natural resources of the area. Systems of farming, with dairying and beef production as the principal livestock enterprises and early lamb production as a secondary livestock enterprise, combined with the production of Johnson-grass hay and a limited amount of cotton, were found to offer opportunities for increasing returns on farms where livestock are cared for properly.

Information was assembled relative to consumption of livestock and livestock production in six typical cities of the southeastern section of the country and as to the whole-milk supply of the important cities of Florida. The possibilities of adapting production so as to better meet the needs of these near-by markets were pointed out. Available statistical data on the livestock industry in the coastal plains region, census and crop-estimates data as to livestock production, and related information on crop acreages, utilization of farm land, population changes, and other items were assembled for the different periods from 1870 to 1925. These data were made available to those interested in the development of livestock production in this region and proved helpful in determining the possibilities of profitable livestock production in different parts of the region.

This study developed the need for more information as to the possibilities of hog production in the peanut-producing areas of Alabama and Georgia. A detailed study of methods of hog production and of the most profitable types of farm organization for this area was undertaken in cooperation with the agricultural colleges of these States.

#### SYSTEMS OF HOG PRODUCTION ON CORN BELT FARMS

Studies of systems of pork production on Corn Belt farms were continued and timely reports of value to farmers in improving their methods of pork production were issued. The effect of the rate of feeding early spring pigs on costs, gains, time of marketing, and profits was given special study. The field work in connection with these studies in Iowa, Illinois, and Indiana is now practically complete, and atten-

tion is being concentrated upon the analysis of several years' data.

#### POULTRY PRODUCTION

Information bearing upon all phases of the poultry industry, especially in the Western States, was assembled and presented to research and extension agencies in those States. Especial attention has been given to the premium paid to farmers for high-quality production and to the farm-management practices essential in maintaining a high-quality product. A detailed study of methods and practices in poultry production in important producing areas in New York was made in cooperation with the New York State College of Agriculture.

#### RANGE-CATTLE PRODUCTION

Studies embracing the important range-cattle-producing areas of the United States were continued in cooperation with the Bureau of Animal Industry and State experiment stations and extension services. These studies point out desirable practices in ranch operation as well as the comparative advantages and disadvantages of various types of livestock in the different areas and the probable market demand for them. Those phases of the studies already completed indicate the types of ranch organization and production practices which are likely to prove most profitable in these areas. The phases of the study now under way include a detailed study of production methods, practices, and costs in 60 representative ranches in the northern Great Plains. The detailed information from these ranches will be used as a basis for improving the organization and management of other ranches in the area.

#### BEEF CATTLE IN THE APPALACHIAN REGION

A detailed study of the methods of fattening cattle and of the organization of beef-cattle farms in southwestern Virginia was completed. It was found that because of an important change in the market demand for different types of cattle an earlier maturing type of cattle offers better opportunities for profit than the type generally handled. Changes in cropping systems were also found to be desirable, as the present systems usually do not provide sufficient amounts of grain to supplement grass feeding.

#### DAIRY PRODUCTION

The survey of dairy farming in the Shenandoah Valley of Virginia was

completed in cooperation with the Virginia Polytechnic Institute. This study indicated a number of factors which were responsible for inefficient production and pointed out specific ways in which the farms might be organized to produce dairy products to better advantage and to increase the returns from farming.

In cooperation with the Vermont College of Agriculture studies of the relation between changes in the price of milk and of feeds in the New England States and the quantity of milk which farmers produced were completed. These studies of the elasticity of milk supply showed that from one-half to three-fourths of the variation in production was directly due to economic conditions, and furnished cooperative associations and others interested in the marketing of milk a more definite basis for establishing sound price policies.

At the request of the extension directors of the 11 Western States a representative of the division prepared a report on the statistics of the dairy industry, with special reference to this area. All of the available statistical information relative to the dairy industry was assembled, and this information has been used extensively by State extension agencies in connection with agricultural program making.

A representative of the division aided the Texas and New Mexico agricultural colleges in an economic study of the agriculture of the Elephant Butte project. Special attention was given to the place which dairying should have in the agriculture of this project.

In cooperation with the Bureau of Dairy Industry and the Virginia Polytechnic Institute a study of dairy farming around Richmond, Va., was inaugurated. In this study the organization and operation of dairy farms is being related to the demand for dairy products in Richmond and the adjacent area. Methods and practices responsible for differences in farmers' earnings and the proper place of the dairy enterprise on farms in this area will be determined. The distribution and disposition of milk and milk products produced in the area are also being considered.

#### SPECIAL STUDIES AND SERVICES

In cooperation with the Ohio State University a study of the farm business and the cost of living by farm families was begun in three localities in the less prosperous agricultural sections of southeastern Ohio. In addi-

tion to the usual analysis of farm-management problems special attention will be given to the cost of living on these farms and comparisons of living costs and systems of farming followed will be made for the same farms. Opportunities for increasing and for more judicious spending of incomes will also be pointed out by this study.

Business surveys of farms in localities in Overton and Washington Counties, Tenn., were made in cooperation with the experiment station. A number of the farmers in these areas were aided in starting farm-account books with a view to gaining more information for use in improving their own farming systems.

The summary of all farm-business surveys which was published in 1926 was kept up to date. During the year summaries of 2,821 farm records from 51 localities in 11 States were added to the summaries previously assembled. Special studies of the incomes from the same farms over several successive years were made with a view to determining what factors are responsible for consistently high or consistently low incomes.

Information relative to dry-farming methods and practices in the Columbia and Snake River Basins was brought up to date.

At the request of authorities of the Soldiers' Home, Washington, D. C., a study of the cost of producing milk at the dairy farm of the Soldiers' Home was made and suggestions given as to how their milk can be produced more economically without lowering the quality of the product. The Bureau of Dairy Industry cooperated in this work.

#### FARM RETURNS

Reports on the general results of farming in 1926 submitted by farmers were summarized. A return of \$1,133 to the owner-operator for the use of \$16,308 of capital, and the labor of the farmer and his family, is the average shown by 13,475 farms for 1926, compared with \$1,297 by 15,330 farms for 1925, \$1,205 by 15,103 farms for 1924, \$1,020 by 16,183 for 1923, and \$917 by 6,094 for 1922.

The return of \$1,133 per farm in 1926 includes \$975 cash, the excess of cash receipts over cash outlay for current operating expenses, and an increase of \$158 in the inventory of crops, livestock, machinery, and farm supplies from January 1, 1926, to January 1, 1927.

In addition, the farm family had food produced and consumed on the

farm the estimated value of which on the farms reporting the item was \$282 and fuel from the farm and use of house the values of which were not reported. On the other hand, interest averaging \$216 paid on indebtedness and outlays for improvements averaging \$128 were not included in the computation of current cash operating expenses.

In all of the geographic divisions the results were lower in 1926 than in 1925, except in the south central division, where the increase in inventory value during the year was relatively large. In the West North Central and the Southern States the returns were even smaller than in 1924. Rather generally in all divisions the receipts averaged smaller and expenses nearly the same or larger.

#### DIVISION OF CROP AND LIVESTOCK ESTIMATES

W. F. CALLANDER, *in charge*

The outstanding development in the work of this division during the past year has been the inauguration of a plan of decentralization, whereby much more of the primary data collected from farmers and others relating to acreage of all crops, numbers of livestock, and monthly condition and yield reports on crops other than cotton, corn, wheat, and oats will hereafter be gathered by the field offices, of which the division now has 41. For the first time in the history of the division all of the information relating to the acreage of the 1927 crops has been gathered and compiled by the field offices. Arrangements were made to have this information reviewed by statisticians from the Washington office during June, just prior to the issuance of the preliminary acreage reports for the year. In a number of the less-important States the lists of township correspondents, who have heretofore been reporting to the Washington office not only on acreage but on all other items, have been transferred to the field offices.

This plan of decentralization has been under consideration for several years, but was postponed until the field service could be fully organized and two men placed in all important States. The new arrangement will result in a saving of time, in that instead of having two complete reports prepared on every item, one in Washington and one in the field office, only one report, which will be based on larger returns, will be prepared in the field offices. The decentralization plan will not be

extended, however, to what are commonly called the "speculative" crops—namely, cotton, wheat, corn, and oats—except in the minor States. It is felt that it is necessary in order to properly safeguard these reports to have a check in the Washington office on the reports submitted by the field offices. The decentralization has resulted in a material reduction in the clerical staff of the Washington office and further reduction will probably be made.

#### ORGANIZATION AND PERSONNEL

The personnel of the division now consists of 286 employees, of which 195 are stationed in the field offices. It is probable that during the coming year there will be further reductions in the Washington clerical staff and increase in the field office. During the past year 5,400,000 schedules were mailed out by the Washington office. About 500,000 of these covered miscellaneous inquiries for other divisions of the bureau engaged in research work. About 3,000,000 schedules were sent out by the field offices during the past fiscal year. During the coming year the number of schedules sent out by the Washington office will be reduced to about 1,500,000 but the schedules sent out in the field offices will be very materially increased, as it is proposed to handle all of the rural-carrier surveys, both relating to livestock as well as to acreage, through the field offices. This will result in a saving to the Post Office Department, in that the schedules will go to a central office in each State instead of all being forwarded to Washington.

The work of this division is now carried on in cooperation with State agencies in 32 States. In 27 States the cooperative agreements are with the State department or board of agriculture, and in 5 States with the State colleges of agriculture. It is possible, by reason of these cooperative agreements, to greatly expand the work. Many of the lines of work now being carried on would have to be dropped were these agreements abrogated. It is also preventing the duplication of statistical reports and increasing the accuracy of the information collected.

#### CROP FORECASTS

Several changes have been made in the program of issuing crop forecasts, commonly referred to as the monthly crop reports. During the past two years the date of the first forecast of production has been changed to the 1st of July for all crops except winter

wheat, for which the first forecast is still made on the 1st of May. The forecasts of hay, formerly made on the 1st of May, and of the spring grain crops, formerly made on June 1, have been discontinued. Correlation studies of the relation of condition to final yield for these crops were not high enough to warrant the continuation of these forecasts, especially since it is possible to make a more accurate statement of acreage on the 1st of July than on the 1st of May or June. According to the present program, the estimate of acreage of all crops is made at one time. There is a distinct advantage to this change in program in that the acreage data are all pointed to the July 1 estimate. Collection of this material can be made more thoroughly and analysis can be made more comprehensive, with resultant improvement in the accuracy of the preliminary statement of acreage and correspondingly less need for revision in December. The date for the first forecast of the cotton crop has also been delayed by one month as a result of congressional legislation, and is now made on the 1st of August, although a statement of the acreage in cotton is made on the 1st of July. All of the mid-month reports—that is, for July, August, September, October, and November—have likewise been eliminated as a result of congressional legislation.

In connection with the crop forecast made at time of harvest, additional information has been collected for a sufficient number of years on probable yield to enable the division to use currently reported probable yield figures for the major crops. For example, on the 1st of September an inquiry is now made not solely on condition, as formerly, but also on the probable yield of spring wheat, oats, and barley. A study of relationship between these probable yield figures and the final yield figures, as reported on the 1st of October for the past three years, has indicated that in many States the reported probable yield is a somewhat better indication of final yield than is the condition figure, although in other States, notably the more northern States, the condition figure gives as accurate or more accurate indication of the final outturn. As a result of this change in method, the forecast immediately preceding the preliminary estimate has been materially improved.

The division has extended its work along the lines of collection of collateral data bearing upon total production. In quite a few additional States the division is now obtaining informa-

tion on railroad shipments of various grain crops which has proved of material assistance in making a revision of the preceding year's crop. Considerable emphasis has been placed upon the disposition of crops by farmers in order to make accurate utilization of the figures on railroad shipments.

The field service has devoted considerable time and effort to the conduct of that portion of the bureau apple survey which relates to a cross-section by varieties of the bearing and nonbearing trees in commercial apple orchards of the country. In many States returns have been received from more than 60 per cent of all the orchards having 300 or more trees. Of particular importance at the present time is the information being collected with respect to the year when trees were planted, which will afford a picture of the number of trees, by varieties, of the various age groups, bearing and nonbearing, in the commercial orchards of the country.

#### LIVESTOCK REPORTS

The most notable advance in the livestock-estimating work the past year has been along the line of estimating the actual production of meat animals and the value of this production for meat purposes by States. This production is estimated in pounds and is evaluated by an average price per pound received by producers. By the method used in determining production, changes in inventory amounts at the beginning and end of the year are included, but changes in inventory unit values are excluded.

The basis of these estimates are State balance sheets for each species, showing as debit items the number on hand at the beginning of the year, the number born and the number brought into the State, and as credit items the number shipped to market, the number slaughtered locally and on farms, and the number that died.

These balance sheets involve estimates of the size of the calf, pig, and lamb crops for the year by States. The greater part of the information used as a basis for these estimates is obtained from the livestock-survey cards distributed by the rural mail carriers. This means of getting sample data on livestock is proving to be of very great value.

In addition to the pig-survey reports in June and December, showing the size of the spring and fall pig crops, the first estimate of the size of the lamb crop by States was made in July, 1926. The pig-survey reports for 1925

and 1926, as checked by subsequent marketings and slaughter, were very dependable indicators of changes in hog supplies. The 1926 lamb-crop estimate has been shown by subsequent marketings to be accurate, and the dependability of the reports on the lamb-feeding situation and the estimate of lambs on feed January 1 has been verified.

On the whole it is felt that the efforts directed to securing timely information as to livestock production and numbers are bringing increasingly dependable results and that the present program of livestock reports will furnish most of the information needed by livestock producers and the livestock trade.

#### FARM-PRICE REPORTS

The farm-price work has been materially strengthened during the past three years. About 120 per cent more price schedules are received each month than during 1924. This increase in both the representativeness and size of the price sample has been brought about by an increase of only about 20 per cent in the total number of price reporters on the list, more than 50 per cent now making returns, as compared to about half this number in 1924. The price records of the department from 1866 to 1925, by States, have been published in a series of four statistical bulletins entitled "Prices of Farm Products Received by Producers."

The crop year weighted annual price averages of farm crops have been recalculated and published on the basis of marketing information for the current year. These averages were previously computed on the basis of the usual or average rate of marketing over a period of several years. This improvement enables the current annual price to reflect more closely the conditions for the current year than was formerly the case. At the present time work is being started on computing crop-year average annual prices by States for the more important farm products. An effort will be made during the coming year to determine the seasonal movement of the prices of important farm products in the leading producing States.

#### PRICES OF ARTICLES BOUGHT BY FARMERS

The collection of data concerning the prices paid by farmers for things which they buy has been definitely standardized, and placed on a basis

which will enable the department to publish quarterly prices on more than 100 items of farm expenditure. The original inquiry which has been in use since 1910, with some revisions made in 1922, has been divided into five separate inquiries. This not only shortens the schedule going to the individual reporter but also greatly increases the percentage of items for which returns are made on a given schedule. It will require several years of effort to build up the lists for this inquiry to a point where they will be in as satisfactory a basis as are the farm-price reports of the department. These price data beginning with 1909 for most items will be published on a geographic division basis within a few months. A detailed analysis of these data is now in progress. These prices are being used as the basis for a retail price index number which will be used in determining the purchasing power of farm products and agricultural income.

#### HISTORICAL PRICES

The collection of prices of farm products received by producers from 1850 to 1910 is about completed for the State of Maryland. A similar project is under way in cooperation with the experiment station in Virginia.

#### RESEARCH IN STATISTICAL METHODS

Research work with a view to improving the quality and accuracy of forecasts made by the division has been continued. The problem of ascertaining statistically the most significant method of utilizing condition figures as a means of forecasting the final yield per acre is being given increased attention. Particular attention is being given to the possibility of using the relationship of weather to yield to supplement the condition figures as now used in making forecasts. Preliminary studies indicate that this is a very promising field for study.

#### COTTON DIVISION

ARTHUR W. PALMER, *in charge*

The functions of this division consist of service and regulatory work performed under the United States cotton futures and cotton standards acts, of demonstrational work, and of research work in related fields.

In the service and regulatory work no important change occurred during the past fiscal year. No formal enforcement action has been necessary

under either the cotton futures act or the cotton standards act. A number of amendments to the regulations under both acts have been necessary, and revised regulations under the cotton futures act were promulgated by the Secretary, effective May 15, 1927.

An amendment to the cotton futures act was approved on February 26, 1927. This amendment eliminated from section 6 of the act the provisions under which traders on a futures exchange located at a place which was itself a bona fide spot market had been required to base their settlements for grades above and below middling delivered on future contracts upon the commercial differences prevailing in that market alone. The amendment became effective upon its approval, and henceforth the differences used in the settlement of section 5 future contracts in all markets of this country will be based upon the averages of the 10 spot markets which have been designated for that purpose.

#### STAPLE STANDARDS

The official staple standards of the United States have the same legal status in this country as do those for grade and color, but, unlike the latter, have never been adopted abroad. It has been felt that the conditions under which American cotton is exported would be much improved if an agreement on staple standards with the importing markets similar to the universal grade standards agreements could be reached. American agricultural and trade groups have so expressed themselves and the International Federation of Master Cotton Spinners' and Manufacturers' Associations have requested that steps in this direction be taken.

Having before him these suggestions, the Secretary invited the European cotton exchanges to send representatives to a conference in London on August 11, 1926. Owing, however, to objections on the part of the majority of the representatives from the European exchanges, no agreement was reached.

The official cotton standards of the United States for length of staple continue to be the required basis for transactions in American cotton sold in interstate and foreign commerce on standard description.

#### SNAP COTTON CONFERENCE

On January 10, 1927, a meeting was held in Washington between officials of this bureau and representatives of

cotton interests to discuss the problems presented by the increase in the amount of snap cotton and the certification of such cotton for delivery on future contracts. The conference, after a full discussion, gave it as the consensus of opinion that the method which has been and is now pursued by the bureau is the most practicable one at present.

#### "STRICT MIDDLING GRAY" MADE TENDERABLE

Trade interests have urged that the Secretary by regulation increase the number of tenderable grades under the cotton futures act by treating as tenderable certain of the so-called descriptive grades, particularly strict middling gray, middling gray, and strict low middling spotted. After due consideration, the Secretary amended the regulations to provide that, effective August 1, 1927, strict middling gray be added to the list of grades for which certificates of tenderability are issued.

#### UNIVERSAL STANDARDS CONFERENCE OF 1927

The regular biennial universal standards conference between the department and the nine leading cotton exchanges and associations of Europe convened in Washington March 14, 1927, for the purpose of approving copies of the universal standards for American cotton for use by the department and by the European exchanges and associations during a two-year period beginning August 1, 1927. Sixty complete sets of the universal standards were prepared and distributed in accordance with the agreements with the European associations.

#### PREPARATION AND DISTRIBUTION OF THE OFFICIAL COTTON STANDARDS

During the year 6,278 boxes of the standards for grade and color and 5,720 staple types were sold to the public, and \$35,096.32 collected from the sale of these practical forms. Sales of loose, rejected cotton amounted to 601 bales, for which the sum of \$30,862.77 was received.

#### CLASSIFICATION OF COTTON UNDER COTTON FUTURES ACT

All cotton intended for delivery on future contracts is classified by officers of the Department of Agriculture. The total number of bales classed for certification amounted to 422,012 compared with 339,518 for the fiscal year 1926. Reviews amounted to 93,391

bales, compared with 117,351 bales during the fiscal year 1926, and preliminary informal classification, 1,729 bales, compared with 5,246 bales the year before. The increase in the transfer of cotton to New York was quite marked; 141,054 bales were transferred to that point from New Orleans, Houston, Galveston, and Savannah. Transfers to New Orleans numbered 485 bales and to Houston 72 bales.

The increase in the number of bales tendered for delivery at Galveston necessitated the establishment on December 1, 1926, of a separate committee of the Houston-Galveston Board of Cotton Examiners in Galveston to handle the large volume of certifications.

The classification work continued to be self-supporting. Collections during the year amounted to \$181,226.74; disbursements, \$152,297.34. Fees charged for the service remained unchanged from the previous year, except that for supervision of the transfer of certificated cotton which, by an order of the Secretary of Agriculture, issued May 15, 1927, was increased from 20 cents to 30 cents a bale, the lower fee having been found insufficient to cover the cost of the service.

#### CLASSIFICATION UNDER COTTON STANDARDS ACT

In consequence of requests submitted under the cotton standards act there were issued Form A memoranda on 43,283 bales, Form B certificates on 1,212 bales, and Form C certificates on 25,083 bales. Total collections for the service under the cotton standards act amounted to \$22,233.25, including the fees collected for licenses issued to classify cotton.

#### LICENSING OF COTTON CLASSERS

Following a decision that all licensees and applicants for licenses to classify cotton under the United States warehouse act should submit to the standard test in cotton classing, 49 applications for examinations were received during the year. A large number of the applicants under the warehouse act availed themselves of the opportunity to attend the schools in cotton classing conducted at agricultural colleges.

#### DEMONSTRATION OF STANDARDS

Demonstrations of the standards and their use have been made during the year, and assistance has been given to a number of agricultural colleges

throughout the Cotton Belt in the conduct of cotton-classing schools. It was thought advisable to continue demonstrations of the standards to European holders and users of American cotton.

#### FUTURE AND SPOT MARKET INVESTIGATIONS AND COTTON PRICE QUOTATIONS

The quotations from the 10 designated spot markets are used in determining the commercial differences to be used in the settlement of future contracts made subject to section 5 of the United States cotton futures act involving the delivery of cotton of grades other than middling. Under this project differences are supervised.

Another function of this project is to obtain accurate price data on cotton and to give them wide publicity, particularly the prices of future contracts and spot cotton, in order that producers, merchants, and others interested in spot cotton may have reliable price information for their guidance. During the year the supervisory work necessary to insure accuracy and reliability in the quotations and prices from the 10 designated spot markets was continued in the same manner as previously.

Attention was directed toward gathering and disseminating information on prevailing premiums as quoted in various cotton growing and consuming districts for cotton of the character and staple commanding prices above short-staple cotton. This phase of the work is of particular interest to growers of such cottons, as it enables them to have a more accurate knowledge of the value of their cotton.

Newspapers and periodicals continued to publish information assembled by the cotton price-quotation service, but on a very much broader scale than heretofore, and cooperated in this work by publishing daily and weekly reports touching on the more vital price data which were furnished by our Washington and field offices. This service was therefore made available to a very large number of interested persons who would not otherwise have been reached. Through the medium of the branch offices, as well as through our Washington office, cotton prices and cotton-market conditions in general were broadcasted and furnished to the entire Cotton Belt. In addition to cotton quotations, the market news service carried general information pertaining to cotton and cotton marketing, which is considered of value to all interested in cotton.

#### STANDARD GRADES FOR COTTON LINTERS

Effective August 1, 1926, eight grades for American cotton linters were established as part of the official standards of the United States. Interest in the standard grades for linters has been increasingly active. During the year department representatives have been called to numerous meetings and conventions of the various branches of the industry for the purpose of discussing the plan of standardization and utilization of the standards. The Interstate Cotton Seed Crushers' Association, composed of producers, dealers, and consumers of linters, adopted a set of trading rules based upon the use of the standards.

#### COTTONSEED STUDIES

Studies of cottonseed for crushing purposes with a view to establishing standard grades have been continued. One of the first problems to be met was that of devising apparatus for obtaining representative samples of car lots of seed, since no suitable seed-sampling device was available. To meet this need, the project leader invented a simple apparatus, which has given very satisfactory results and which will be placed on the market shortly.

Analyses of samples from several thousand car lots of cottonseed have been made in an effort to determine the factor which gives the best index of the value of the seed. The analyses all show that the value differentials on account of differences of oil percentages are nominal in comparison with value differentials on account of differences of net kernel percentages. Mechanical difficulties will have to be overcome before a practical application of the theory of grading cottonseed on the net kernel content of the seed can be made. Efforts are being made in this direction.

#### COTTON RESEARCH FURTHER DEVELOPED AND SYSTEMATIZED

For a number of years there has been among producers and students of our cotton problems a growing realization of the need for economic research in cotton in line with a systematic and comprehensive plan.

Cotton is this country's only large agricultural product, all of which moves from the farm to market. Its value is determined from its spinning qualities, but the factors which make



up its spinning value are only partially known and understood. Without such knowledge cotton breeding, production, and marketing are handicapped. Projects for the scientific study of cotton fibers and spinning tests are expected to add vitally to present knowledge of the characteristics of cotton which give it utility. Other studies have been projected and begun in prices and quotations in local and central markets. Analyses of demand and supply are projected in studies of the grade and staple of the crop and of cotton utilization.

Although only well begun, the program has met with great interest and appreciation on the part of growers, agricultural institutions and organizations, and many branches of the industry.

#### COTTON-SPINNING TESTS

The cotton-testing work aims to determine the relative waste and the spinning and bleaching qualities of different grades and varieties of cotton subjected to various conditions; with information concerning quality, to assist the Bureau of Plant Industry and State experiment stations to determine from a quality standpoint the best variety of cotton to grow in certain localities; to study the effect upon spinning utility of varying the conditions of ginning, baling, compressing, and handling cotton; and to conduct manufacturing tests in connection with the study of new uses for cotton. Co-operation has been undertaken through the cotton production council of the Association of Southern Agricultural Workers with the State agricultural experiment stations, which are studying the factors affecting the quality of cotton.

The cottons which are used in the variety tests are selected through co-operation with members of the Bureau of Plant Industry, the State experiment stations, or plant breeders. A very large part of the work is conducted at Clemson College, S. C., but the final strength, length, and fiber investigations are conducted in the laboratory at Washington, D. C. Additional tests of the spinning properties of snapped and sledged cotton were undertaken during the year. The results of many of these tests have been published.

Further technical studies have been made on fiber length and strength as related to yarn strength. The results of a series of these fiber tests have been correlated with the results of the spinning tests.

Cotton growers, manufacturers, and others are expressing more interest in this work than ever before. The demand for the bulletins dealing with the various cotton problems is increasing. Inquiries regarding the methods of procedure and the results of our tests are constantly being received.

#### COTTON FIBER STUDIES

Special attention is being given to technological research on the physical characteristics of cotton in relation to spinning utility with a view to providing data relating the various factors of utility to the official cotton standards. Attention is being given to foreign matter, color, preparation or ginning, staple length, and character. The element of character in particular is most complex. Detailed studies of fibers are essential. In this connection some of the work that seems most likely to yield important data concerns the distribution of the different lengths of fibers in the samples, ribbon width, ribbon thickness, area of cross-section thickness of cell walls, size and shape of lumen, morphological features of the individual fiber, with special reference to the fiber tails, number and uniformity of convolutions, and strength of fibers.

Fiber color is also important, since it affects the finishing properties of yarn and goods. "Mixes" of cotton of different colors frequently result in streaks in bleached and dyed goods. Methods of color measurement and analysis are being developed for cotton. The results of this work will have direct application to some of the more complex problems of standardization.

#### PRICE QUOTATION AND MARKETING STUDIES

A study of prices and quotations was begun in Houston, Tex. In co-operation with State colleges and experiment stations in South Carolina, Alabama, and Texas studies have been made at selected points in those States, of the conditions under which cotton is sold in primary markets, the prices paid, and the relationship of price to quality.

#### COTTON UTILIZATION WORK

A comprehensive project for measuring more accurately the demand for raw cotton and for seeking new uses for it has been developed. The first problem was to learn what information was in existence on the demand

side of the cotton market and how much of it could be made available for general use. This part of the work was begun in 1926, and a summary of findings was made in the form of a preliminary report. In addition to the preliminary report already mentioned a report on the uses of cotton bags and other containers in the wholesale grocery trade has been prepared, and a study of qualities of raw cotton required in the manufacture of basic fabrics is under way.

In the field of new uses, studies of cotton bagging for cotton bales are under way which are intended to show the suitability of various designs of cotton fabrics and their relative costs.

In its study of utilization and new uses, cooperation is maintained with the Bureau of Home Economics, the Department of Commerce, and the Cotton-Textile Institute, and valuable assistance has been given by the Association of Cotton Textile Merchants of New York, American Cotton Manufacturers' Association, the National Association of Cotton Manufacturers, State associations of cotton manufacturers, and other agencies and individuals in the cotton-textile industry, as well as large associations of consumers of cotton goods, such as the American Wholesale Grocers' Association.

#### **STUDIES OF QUALITY OF CROP AND CARRY-OVER**

The Mayfield-Jones Act, approved on March 3, 1927, directs the Secretary of Agriculture to collect and publish annual statistics regarding the grades and staple lengths of the carry-over on hand on August 1 of each year, and to publish at intervals estimates of the grades and staple lengths of cotton of the then current crop. Not less than three such reports are to be published each year. Any such statistics published are to differentiate between cotton which is tenderable under the cotton futures act and that which is untenderable. Funds are not available for carrying out these provisions of the law, since the item intended for that purpose was lost with the second deficiency bill, which failed of passage. A small amount was made available in the annual appropriation act for purposes similar to those contemplated in the Mayfield-Jones Act, and some preliminary work is being done in Georgia, Texas, and Oklahoma.

#### **COTTON-HANDLING STUDIES CONTINUED**

Work in cotton tare has been continued. In addition to the tests and

studies of cotton bagging as a covering for cotton bales, a study was made of the handling of cotton in Egypt. Egyptian cotton reaches the mills of this country and of Europe in excellent condition and with a tare so nearly uniform that shipments are spared the expense of "taring," which shipments from this country must frequently bear. It is thought that the report of this study, which is to be issued shortly, will contain important suggestions for the improvement of the American package.

#### **DIVISION OF FRUITS AND VEGETABLES**

F. G. ROBB, *acting in charge*

This division was under the direction of Wells A. Sherman until late in the fiscal year, when he became chief of the division of markets of the California Department of Agriculture, under a cooperative agreement between the State of California and this bureau.

#### **MARKET NEWS SERVICE**

The market news service on fruits and vegetables was continued during the year with a slight expansion of the field program, and a 14 per cent increase in the total number of mimeographed reports issued. About 10,000 names were added to the mailing lists at the 36 temporary field stations, the 17 city market stations and Washington. Approximately 13,860,000 mimeographed market reports were distributed.

Features of expansion included an enlarged use of the Associated Press service, the program in Atlanta particularly being augmented. Market reports on spring lettuce were issued at Phoenix, Ariz., for the first time in 1927. Reports on the prune market were exchanged through the clearing houses at Walla Walla, Wash., and Boise, Idaho. Steps were taken also toward establishing a somewhat similar clearing house for California grapes and some preliminary work was done on a similar plan for northwestern apples.

The bureau's leased telegraph wires continued to be a means of rapid dissemination of market news, including shipment reports, arrival and price information, and statements regarding local conditions in producing sections and terminal markets. Radiotelegraphic communication was operated between Washington and Rochester, N. Y., and Raleigh, N. C., and between San Antonio and the Rio Grande Valley.

Mimeographed summaries issued at the close of the shipping season in the sections covered by temporary field stations were received with much favor and the total number of these summaries issued during the year was 51,400. The number of products included in the regular reports of carlot unloads in terminal markets was increased just before the close of the fiscal year by the addition of pears, plums, and prunes, making a total of 19 products.

At present 34 products are included in the telegraphic shipment reports, and complete market reports are issued on only about 21 of these, not counting the special service on artichokes, broccoli, cauliflower, cherries, peas, and plums and prunes at stations on the Pacific coast. Daily shipment information is published on the remaining products.

#### COOPERATION OF TRANSPORTATION LINES

The volume of carload shipments reported each year has gradually increased. A total of 1,042,203 cars covering 38 products were reported by the carriers, which represents a net increase of about 63,000 over the preceding year.

Daily telegraphic reports on selected perishable products in season are received at Washington from several hundred transportation lines, these reports showing the number of cars originating in each division superintendent's territory. About 68 of these reports are known as "consolidated wires," each covering an important railroad system or major portion of such a system. Approximately 400 individual division superintendents or other reporting officials send daily wires in season.

About 15,000 local freight and express agents send monthly (station) reports by mail, covering a greater number of products than those in the daily wires. Like commodities in the two services are compared, and the discrepancies in the number of cars reported are taken up with each division superintendent.

#### MARKET REPORTS ON PEANUTS

Quotations have been received covering prices paid for farmers' grade stock and selling prices for shelled and unshelled peanuts, peanut oil, and peanut meal or cake. Supplementary information on prevailing prices in the producing areas has been obtained

from peanut brokers in the large consuming centers. Weekly telegrams have been received from the bureau's branch offices covering carlot arrivals and boat receipts during the preceding week, market conditions, and selling prices or quotations in large lots of both cleaned and shelled peanuts. Records of peanut shipments have been obtained through the agents of the different railroads and boat lines serving the Virginia-North Carolina, and southeastern and the southwestern producing areas. Weekly telegrams are received from bureau representatives in San Francisco and Seattle, covering market conditions and prices of Chinese peanuts, f. o. b. Pacific coast points, and the importations of peanuts and peanut oil at those cities. Through the Bureau of Foreign and Domestic Commerce, detailed import and export statistics have been secured for these products and published once a month.

#### MARKET REPORTS ON HONEY AND BEESWAX

At present 110 large beekeepers and honey shippers, scattered throughout the country, furnish reports of market prices, conditions of colonies, and honey plants, etc., that are combined for publication in the honey-market news reports. Representatives in the bureau's branch offices also wire semi-monthly reports of the market conditions and prices.

#### UNLOAD REPORTS FROM PRINCIPAL MARKETS

Regular, periodical reports of unloads of important fruits and vegetables are received from 66 cities. Representatives of the bureau in 25 markets and railroad agents in 41 other markets furnish the unload reports covering 19 important fruits and vegetables. These reports of unloads of carlot shipments are secured each day from the railroads and express companies. Similar reports are received from important boat lines. This information is tabulated and submitted to the Washington office in monthly summary form.

Much of the unload information has been prepared in condensed form and these tabulations have been mimeographed to supply the increasing demand for such data on the part of growers, shippers, members of the trade, transportation officials, schools, and colleges. The figures also are used in summaries of the shipping seasons

in producing sections and in other reviews. The data are of great value because they show the monthly and annual receipts of various products in large consuming centers, as well as the sources of supply. The bureau's representatives in various markets frequently prepare press releases or mimeographed statements for public distribution on the basis of these figures.

#### REVIEWS, SUMMARIES, AND SPECIAL REPORTS

A corps of four or five employees maintains current tabulations of market prices and conditions for all the leading markets and shipping points, prepares special reviews and summaries based largely on these statistics, writes articles for trade papers and farm journals, and handles a large correspondence on miscellaneous market-ing problems.

The weekly summary of car-lot shipments is mimeographed and distributed each Tuesday to about 960 persons, in addition to being duplicated and distributed in part from the various market and field stations. This publication summarizes in comparative columns the car-lot shipments of the principal fruits and vegetables as reported telegraphically by the carriers each day.

Further developments have been made in the line of special monthly or weekly reviews for particular papers, chiefly farm journals, in different parts of the country. A monthly market review, issued to some 80 subscribers on the 15th of each month, tells of the market trends during the preceding four weeks, in addition to outlining future prospects.

Early in the fiscal year, a new series of special commodity summaries was begun, and these have met with much favor. Several pages of text are combined with statistical tables relating to acreage, production, shipments, unloads, prices, etc., so as to bring together the several lines of material affecting the market position of a particular product at the height of the season. These commodity summaries usually are released long enough in advance of the peak movement to be a guide in the marketing of the crop, and effort is made to indicate the crop outlook. Two summaries are issued each month, particularly for the trade and the press.

In addition to these special releases devoted strictly to fruits and vegetables, combination reviews are written, which summarize the market conditions for cotton, grain, hay, live-

stock, meats, poultry products, butter, cheese, wool, etc., along with a summary of the fruit and vegetable situation. All of these special reviews obtain a very wide circulation, because they appear in some of the best-known farm journals.

The fruit and vegetable section of the weekly Marketgram summarizes the latest developments of the preceding seven-day period and describes important changes in market prices and conditions.

The monthly issues of the department's paper, Crops and Markets, contains several pages of statistical material relating to fruits and vegetables. One table shows car-lot shipments by States and by products, and another table gives a monthly range of jobbing prices of the leading products in several important markets.

Special reports by mail, messenger, and telegraph are prepared for certain newspapers and farm journals that have requested this service. These reports, some of them daily and others weekly, summarize the market situation on selected products and are published regularly by the respective papers.

Considerable work is done in Washington and at various branch offices through the Associated Press and similar services. Work at Atlanta has been developed particularly, and, during the five months when leased-wire service to Atlanta is discontinued, the Washington office prepares a daily report on southern products, which is transmitted by Associated Press wires to the Atlanta office.

After the close of each temporary field station of the market news service, the local representative writes a summary of the daily information that was published during the period of operation, together with a general review of the marketing season in that territory. This summary in the hands of farmers points out the successes and failures of the past season, and serves as a guide in the planting, harvesting, and marketing of the crops of the following seasons.

#### STATE COOPERATION IN MARKET NEWS WORK

Cooperative market news work has been continued in 20 States. The assistance given by the various States has made it possible to give a much more complete service than would otherwise be possible. In 6 of these States the fruit and vegetable work has been incidental to a general market news program, but in the other 14

States specific fruit and vegetable work has been provided for. In many sections, State representatives aid in obtaining information relative to prices and conditions in producing districts and their assistance in all cases has resulted in a wider distribution of the market information.

A rather definite policy has been established that no additional field stations shall be opened except where local or State financial assistance can be given, up to approximately half the cost of operation. During the early part of 1927, it was possible, on this basis, to give a service on spring lettuce from a field station at Phoenix, Ariz.

#### CLEARING HOUSE FOR NORTHWESTERN PRUNES

At the request of the Shippers' Traffic Association at Walla Walla, Wash., a representative of the new service was stationed in the Walla Walla-Milton-Freewater prune district, to aid in the marketing of the fresh prune crop. This region had had difficulty in previous years in the marketing of this crop, and during 1926 devised what was known as the "Walla Walla plan," which included the operation of a clearing house for market information for the prune growers and shippers. The shippers, who handled nearly 95 per cent of the output, each day advised the Government representative of their quotation, sales, primary destinations of shipments, diverted cars, rejections and allowances, cancellation of orders, etc. This information was then compiled and issued in the form of a consolidated report to all of the cooperators, and their accounts were later checked to verify the accuracy of the reports. This daily exchange of information through an official agency tended to stabilize the market, create a feeling of mutual confidence among the shippers, improve distribution, and prevent the overloading of any of the consuming centers. Faced with strong competition from the heavy crops in the East, this plan of marketing northwestern prunes is believed to have averted the disasters experienced in previous years and to have aided the growers in getting fair returns.

The clearing house for California grapes to be in effect during the fiscal year beginning July 1, 1927, will be operated on lines very much like those for northwestern prunes, the greater importance of the grape crop simply emphasizing the need for a clearing-house plan.

#### STANDARDIZATION WORK PROGRESSES

A gratifying impetus is given to national standardization by the adoption of various grades as official State standards. Twenty-seven States have now officially adopted one or more of the United States standards.

With the exception of a few commodities such as California citrus fruits and northwestern apples, the United States standards for fruits and vegetables are generally recognized by the trade as their commercial standards. The food products inspection service has been largely responsible for introducing new standards and extending the use of our old ones. National standardization of fruits and vegetables would no doubt still be in its infancy were it not for the work done by this service. The research relating to the promulgation and use of standards entails obtaining data upon which to base standards for new commodities and also for the purpose of revising old specifications. Very satisfactory progress has been made during the past year, standards for 37 commodities having now been recommended.

This project works in close cooperation with the inspection service. Considerable time has been spent with the inspectors at both shipping point and receiving markets in assisting with interpretation of grades and securing information for the revision of old grades. Photographs of grade defects of fruits and vegetables are being prepared and placed in the hands of inspectors to aid in securing a more uniform interpretation of the United States standards. Word descriptions are often inadequate to describe the degree of damage which is permitted in any particular grade, and in many cases photographs are proving extremely valuable.

#### RESEARCH STUDIES

This bureau is cooperating with State agencies to make a national survey of the apple industry. This division is aiding in this study by furnishing an employee to obtain and compile data relating to distribution, prices, methods of sale, and selling costs. Market news men and inspectors in the city markets are also aiding in the survey by interviewing the trade to obtain market information.

A statistical study of the commercial strawberry industry is being made to show the areas of production, carlot distribution from States of origin, and market supply of 69 of the larger cities. Statistical tables of acreage,

yield per acre, production, shipments, and unloads are being compiled in such a manner as to display the principal relations of each to the others and to the whole. This study will furnish information which should be of great aid to those interested in gaining a better understanding of the marketing conditions of the strawberry industry.

This division assisted the Division of Agricultural Cooperation in a study of market preferences for Washington-Oregon prunes existing among the jobbing and retail trade in several important primary markets.

In cooperation with another division of the bureau, a marketing specialist on fruits and vegetables has been maintained at London visiting the fruit and vegetable markets in Great Britain, Irish Free State, France, Holland, Germany, Denmark, Norway, and Sweden. European competition and demand for apples, pears, oranges, grapefruit, and fresh prunes were reported upon. A special service was rendered to producers and exporters by observations of the marketing specialist concerning the condition of American fruits arriving in Europe and its relation to grading, packing, and shipping methods. Research work was done also in determining European demands respecting specifications for apple standards.

During the apple-marketing season a London circular was issued biweekly and forwarded to European agents, distributors of American fruits, giving them information on fruit grades, inspection service, crop conditions, movement, and prices in the United States. This service is very popular with the smaller wholesale merchants and agents who are but very inadequately informed by their shipping connections on facts requisite to intelligent merchandising of American fruits. During the months of June, July, and August of each year the marketing specialist has returned from the foreign station and visited growers and shippers in districts producing exportable fruits, addressing meetings on problems attending the foreign marketing of their products.

#### CONTINUED GROWTH IN INSPECTION SERVICE

Both receiving and shipping-point inspection of fruits and vegetables have been conducted on the same basis as during the two previous years. Receiving-point inspection showed a slight increase of 263 cars, while shipping-point inspections showed an increase of 27,963 cars. This increase has been

generally well distributed among the various States, although in a few States there was a slight decrease in the work.

#### RECEIVING-POINT INSPECTIONS

Offices were maintained in 40 cities. From these offices inspections were made, to the extent permitted by the time of the inspectors, at other near-by points from which requests were received.

A total of 32,794 cars of fruits and vegetables were inspected at receiving points, and in addition more than 8,000,000 pounds of fruits and vegetables and other foodstuffs were inspected for the steamship lines.

Developments in connection with the apple-export situation made it necessary during the past season to issue different colored certificates which were designed to show the freedom from spray residue of apples intended for export. The requirements in this regard have been more strict and in addition to requiring apples to be free from residue on the surface they were also required to be free from heavy or crusted residue in the stem or blossom-end basins. Slight or inconspicuous spray residue was passed for export.

The regular certificates (white original and blue copies) were issued on all unrestricted inspections of apples that met the export requirements, that is, free from conspicuous spray residue. On all lots which did not meet these requirements a yellow certificate was used both at point of origin and in the receiving markets. In the terminal markets the yellow certificates were also used on restricted inspections and all inspections of apples which were not free from conspicuous spray residue.

In the case of pears a chemical analysis was required in order to determine whether the amount of arsenic exceeded the tolerance or not. Samples drawn by food-products inspectors were taken to chemists, who had been approved by the Bureau of Chemistry, and their analyses were also reviewed by that bureau. When the amount of arsenic exceeded 0.01 grain per pound of fruit the yellow certificate was issued, and the shipment was not acceptable to the steamship companies for export.

#### AUCTION INSPECTIONS

Beginning August, 1926, and continuing until the end of the grape season, a new line of auction inspection work was started in Chicago. Inspec-

tions had been made in previous seasons of grapes, cantaloupes, and other products to be sold through the f. o. b. auctions, but the grape-inspection work in Chicago was the first undertaken in connection with produce to be sold through a delivered auction. The agreement which was entered into with a large fruit-auction company provided for the inspection for condition only of all car lots of California juice grapes offered for sale by this company in Chicago. A total of 1,129 cars was inspected under the terms of this agreement. A written report, giving the results of the inspection, was tacked on the side of each car prior to the daily auction sales. The buyers also had the opportunity to examine the samples themselves before the sales started. Both the buyers and the auction companies expressed their approval of the service rendered by the Federal inspectors, who exercised great care in selecting samples that fairly represented the quality and condition of the contents of the cars from which samples were taken.

#### RAILROAD INSPECTIONS

The railroad work in Cleveland, Ohio, which was conducted under a special contract with a railroad company, has continued steadily throughout the year, a total of 5,271 inspections having been made. When this service was first started two men were sufficient to handle the work, but toward the close of the fiscal year it was necessary to keep a force of four men available for this work. A special feature of the work has been the keeping of records showing the number of broken packages per car. A great many claims were filed against the carrier on account of broken packages and damages to their contents, and the railroad officials, as well as receivers, have informed this bureau that its services in this respect have been of great assistance in settling claims with fairness to both sides.

#### INCREASING DEMAND FOR SHIPPING-POINT INSPECTIONS

The fifth year of operation of the shipping-point inspection service continues to demonstrate the fact that this service is of benefit both to producers and shippers, as it furnishes them an unbiased report on the quality and condition of their products which facilitates the marketing of their goods and safeguards their interests in cases of damage or disputes.

The service has also served as an educational agency and has been very effective in promoting the use of uniform standards and improved methods of preparing products for market.

A total of 193,220 cars of fruits and vegetables were inspected at shipping points located throughout 40 States. This was an increase of 27,968 cars over the number inspected during the previous year. Florida showed the greatest increase of any State, the increase being 6,157 cars. Practically all of this work was done under cooperative agreements in the various States.

#### ENFORCEMENT UNITED STATES STANDARD CONTAINER ACT

The work under the standard container act has increased greatly. During the past year a total of 6,605 containers have been tested compared to 2,571 during the preceding year. Marked changes have taken place in the package industry and this division has had great difficulty in meeting the demands made upon it for consultation and checking of specifications. Representatives have attended meetings of package manufacturers and carried on as much educational work as time permitted.

#### COLLECTION AND DISTRIBUTION OF 1918 EXCESS WOOL PROFITS

Pursuing the policy decided upon a year ago of suspending action in excess-wool profits cases pending in district Federal courts to await a decision by the Supreme Court as to the right of the Government to collect excess-wool profits under the 1918 wool regulations issued by the War Industries Board and subsequent agricultural appropriations acts, little progress has been made during the fiscal year 1927 in closing out this work. The work will be held in abeyance until a final decision is handed down.

The activities of the domestic wool section have been confined principally to the auditing of additional reports received from wool dealers in 1918, perfecting the audits of cases awaiting trial and distributing excess profits amounting to \$1,695.84 among the wool growers on whose wool the excess profits were made. During the year \$2,421.09 additional excess profits were collected from dealers. The total ascertained excess profits made on wool of the 1918 clip amounts to \$1,510,227.18; the amount collected to date amounts to \$758,940.51, and the total amount refunded to growers amounts to \$452,927.44.

## DIVISION OF LIVESTOCK, MEATS, AND WOOL

CHARLES V. WHALIN, *in charge*

The past year witnessed the attainment of several of the objectives which this division had set as goals to be reached in carrying out its long-time program of research, service, and educational work. Much progress was made in the establishment of standards for livestock and meats. Bulletins carrying descriptions of some of the standards were published and public interest in the division's efforts along this line was aroused to a much greater extent than ever before. This interest was reflected both in increasing demands for the division's grading service on the part of governmental and commercial institutions which purchase meat in large quantities and in increasing requests for information on standardization from producers, consumers, dealers, and others who are interested in the livestock and meat industries.

The progress made by the division in analyzing and interpreting market statistics has been particularly gratifying. This work serves as the basis for livestock outlook reports and intelligent livestock marketing and there is an increasing demand for information based on the division's studies in this field.

The service work of the division both in market news and meat grading was materially expanded and made more complete through various refinements in organization and methods. This work has been developed to the point where it is now an important factor in the nation's commercial life. An experimental meat grading and stamping service has been developed.

In the field of educational demonstrations notable progress has been made in bringing to the attention of livestock producers information regarding consumer demands, market requirements, and the advantages of grade standardization. The response on the part of the public to the division's efforts indicate that there is an urgent demand for more information about marketing and the problems connected therewith.

### GRADE STANDARDIZATION

Public attention was drawn to the division's standardization work during the past year and great numbers of livestock producers and meat consumers expressed interest in this work. A new organization of livestock

producers was formed, having for its sole object the advancement of one of the important aspects of the division's standardization program. Not only livestock and meat-trade journals but the public press in general devoted a large amount of space to explaining, discussing, and advertising this work.

### LIVESTOCK AND MEATS

An outstanding item of research along standardization lines was the work which for the past two years has been conducted under the Purnell act in cooperation with the Bureau of Animal Industry, Bureau of Home Economics, National Livestock and Meat Board, and a large number of agricultural colleges and experiment stations scattered throughout the United States. The stated purpose of this work is "determination of the factors which make quality in meat," but as an incident to the study many data are gathered which are of value in establishing a scientific basis for grade standards. In the prosecution of this study within the past fiscal year 1,000 cattle and 400 lambs were graded—first as feeders, later as slaughter animals, and finally as dressed carcasses. More than 125 cuts of beef and a like number of cuts of dressed lamb were physically and chemically analyzed, cooked, and again graded for color, flavor, tenderness, juiciness, and general palatability.

Although no standards were officially promulgated during the year three sets of such standards were prepared, and it is hoped that all of them will be formally promulgated by the Secretary early in the current fiscal year. The list includes grade standards for five classes of slaughter cattle, grade standards for yearlings and calves, and grade standards for veal and calf carcasses. Work has been done also on the formulation of grade standards for lambs, yearling sheep, and mature sheep, and also for dressed lamb, yearling mutton, and mature mutton carcasses.

In addition to these formal grade standards, manuscripts for a scientific bulletin entitled "Market Classes and Grades of Vealers and Calves," and a circular entitled "Twelve Talks on Grade Standards for Livestock and Meat" were prepared.

### WOOL

Following the promulgation of official standards for grades of wool and wool top based on the numerical system there has been an active demand



for sets of the practical forms of the standards, and 111 complete and 148 partial sets for wool and 137 sets for wool top were prepared.

Establishment of official standards for wool and wool top provides a basis upon which to effect improvement in wool-marketing methods and a better realization of this fact is becoming more apparent among those who are striving to assist producers, as indicated by the increasing demand for sets of the practical forms. These sets are used in connection with educational demonstrations in wool grading and marketing.

A resolution approving the division's wool standards and recommending that they be used by South American countries was adopted by the Pan American Standardization Conference held in Washington under the auspices of the Inter American High Commission. Requests for sets of the standards have been received from government officials of South Africa and inquiries regarding them have been received from several European countries.

Assistance was rendered to the North Dakota Agricultural College in connection with a study of the inheritance characteristics of sheep from a wool-quality standpoint by classifying 285 samples of wool submitted.

In cooperation with the Utah Agricultural College studies were made to determine the density and uniformity of quality of fleeces obtained from sheep representing different range flocks.

#### HIDES AND SKINS

Late in the fiscal year the division appointed a hide-marketing specialist with a view to developing standard grades for hides and skins. Preliminary surveys of existing conditions in the hide and skin industry have been made and several conferences have been held with leading representatives of the various industries which use these products in one form or another. A tentative classification has been drawn up and this will be used as a basis for further studies and investigations.

#### METHODS AND PRACTICES OF MARKETING

Continued attention was given to the collection of data bearing on the direct buying of hogs. Part of the information was used in the preparation of a paper presented before the American Institute of Cooperation entitled "Shifts in Corn and Hog Pro-

duction and their Relation to Livestock Markets and the Packing Industry."

In cooperation with the Virginia Agricultural Experiment Station further studies were made of the problems of marketing Virginia beef cattle by following selected shipments through the market and slaughtering plants. The results of the study were incorporated in the manuscript dealing with this problem which was prepared in the previous year and has since been revised.

#### STATISTICAL RESEARCH

Increasing demands for information regarding price and production trends, consuming demand, market movements, and other factors which would be helpful to livestock producers and others in formulating their production and marketing plans has caused the division to give more attention to the analysis and interpretation of the economic information assembled by its market-reporting staff. The results of the studies made in this field serve as the basis for the semiannual livestock outlook reports and the reviews and special reports dealing with the livestock and meat situation released from time to time. The statistical material assembled in the division includes daily livestock prices by 61 classes and grades at 22 important livestock markets; daily fresh meat prices by 30 classes and grades at 4 markets; prices of cured meats and wool, actual receipts of the various classes of livestock at 18 markets, and many additional data.

Many of the results of the division's statistical research were made available to the public in the form of press articles, reports, addresses, summaries, and reviews, all of which served to give more complete information regarding the economic situation in the livestock, meat, and wool industries.

Progress was made in the analysis of the factors which affect the price of beef cattle. The results of this study will be summarized for publication in the near future.

A study of the daily distribution of livestock receipts at the larger public markets during 1926 was made with a view to determining whether there was unnecessary bunching of receipts on certain days of the week and whether such distribution tended to affect the stability of the market and was uneconomical. Expressions on the subject were obtained from a large number of representatives of producers and the various agencies involved in the marketing and transportation

of livestock. A statistical analysis of the distribution of receipts was also made and recommendations were published for the purpose of bringing about a better distribution of market receipts of livestock.

#### PUREBRED LIVESTOCK PRICE SURVEY

The purebred livestock price survey was continued and printed schedules were sent to 42,000 breeders with the request that they report on the number of purebred animals sold at auction and private sales according to breed, sex, and age.

The survey for 1926 showed further improvement in the purebred livestock industry and that a better demand existed for breeding stock. The publication of price information based on a large percentage of the total transactions serves as a reliable guide to actual values of purebred stock and is an important factor in stabilizing the industry.

#### MARKET NEWS SERVICE

The market news service on livestock, meats, and wool was maintained along the usual lines, the objective being to supply producers, distributors, and others as quickly as possible with complete, accurate, and timely information regarding supplies, demand, prices, and general developments in the various market centers.

The most important development in the news service during the year was its expansion to include the livestock markets at Pittsburgh, Buffalo, Cleveland, Cincinnati, Indianapolis, and South St. Joseph. This expansion was made possible through a small increase in the appropriation allotted for the service, and through cooperative arrangements effected with State departments of agriculture and trade interests. As a result of this expansion the division now operates 22 field offices, and supervises the reporting of 30 public markets. While the funds do not permit furnishing as complete a service as is desired at the new offices, advantage was taken of every local facility and opportunity to provide the best service possible to the patrons of those markets. This was done by preparing special reports for publication in the local press and for dissemination by radio and telegraph. In several instances local commission agencies mimeographed the division's reports and mailed copies to their patrons.

#### IMPROVEMENTS IN THE SERVICE

In order that producers and shippers might have available all informa-

tion which would be helpful in planning their market operations, considerable elaboration and refinement was made in the regular reports released the previous year, and the service was broadened by additional reports, prepared for dissemination by radio and the press. Through the combined media of these two agencies the service is now easily and promptly available to everyone.

The radio has developed into an important agency in the dissemination of market news. Reports from all but two markets at which the news service is maintained are being broadcast by one or more stations, and are being received by many thousands who are interested in livestock, meat, and wool markets. Information at hand shows that at least 55 radio stations, including the most powerful in the country, are making use of the division's reports.

In an effort to obtain the widest possible dissemination of its reports at a minimum of expense to the bureau, the division has continuously sought the assistance of the press. There are now few daily or weekly newspapers located in livestock-producing sections of the country that do not utilize to a greater or lesser degree the division's market news, while practically all of the daily general and commercial newspapers published in the larger cities of the country and a large number of trade papers and agricultural publications are utilizing the service.

The Associated Press was one of the first news agencies to make use of the division's reports, and it is now transmitting these reports on all its trunk lines and on all of its subsidiary and State wire circuits that serve sections of the country where livestock is produced to any appreciable extent. Newspapers with a combined daily circulation running well into the millions now carry the division's reports as disseminated by this agency. The United Press Association also is handling the service on its telegraphic circuits, receiving and disseminating reports from nearly all branch offices, and through the newspapers it serves is making the reports available to additional millions of readers. Increasing use of the service also is being made by the International News Service, which serves a large number of newspapers.

No material changes were made in the form of the daily reports supplied the Western Union and Postal Telegraph companies for their CND (commercial news dispatch) services. How-

ever, the opening of the six new field stations of the division made possible the greater use of these efficient news-disseminating agencies than previously. Shortly after the establishment of the livestock market news service at Chicago in 1918 the division was called upon to prepare the livestock CND reports of the Chicago market. The official character and reliability of the reports supplied prompted officials of the commercial wire companies to request the division to assume the responsibility for the preparation of these reports at all markets where the division maintained a reporting staff. Much attention has been given by the division in past years to this service, not only with regard to the accuracy of the reports supplied but also with regard to their form, content, and filing hours, with the result that, notwithstanding the development of the radio as a means of prompt and widespread dissemination of market news, patronage of the CND service has increased and the service has been improved in all essential respects.

During the past year the number of mimeographed reports released was somewhat in excess of the 5,000,000 distributed the year previous. The number distributed to individuals, however, remained practically unchanged, the increase being reports mailed to bankers, newspapers with rural circulation, and to other commercial concerns which in turn posted or published them. Through this method the number having access to all of the detailed information carried in the mail reports has been materially increased without corresponding increases in the names on the mailing lists.

One regular report not previously released was added to the list of mimeographed releases during the year, a special daily grass-cattle market report, covering the larger midwestern markets and released from the Denver, Salt Lake City, San Francisco, Wichita, and Fort Worth offices during the main grass-cattle shipping season from July 1 to November 1. Another feature of the mimeograph report service added during the year was a weekly report of hogs slaughtered under Federal inspection at eight important slaughtering centers. This information, now released in conjunction with the daily livestock market summaries on Saturday of each week, carries the totals for each of the eight markets for a seven-day period ending the day previous. The Bureau of Animal Industry is cooperating in this service.

Advance and early morning estimates of livestock receipts continued to prove an important feature of the market news service at the major markets. There is perhaps no one feature of the service which attracts as much general interest on the part of the trade as this, especially as confidence increases in the advance estimate being a correct indication of shippers' intentions.

#### DEMONSTRATION AND EXHIBITS

One man devoted most of his time during the year to giving actual demonstrations of the division's livestock grade standards in the important livestock-producing sections of the country. He gave demonstrations at 100 meetings at which the estimated total attendance was 40,000 persons, largely stockmen, county agents, and others interested in learning what the department is doing along standardization lines. The extension service of the department and that of a number of the States cooperated fully in these demonstrations. In many instances the grade demonstrations were conducted right on the farm or ranch, the stockman's own animals being used for the purpose.

In addition to these special grade demonstrations the division contributed to general bureau and department exhibits and assisted various agricultural colleges and State institutions in putting on livestock and meat-grade exhibits. The division's market representatives also took advantage of many opportunities for carrying on educational work, both directly and indirectly. In cooperation with trade interests at certain market centers demonstrations of the standard classes and grades of livestock, meats, and wool were made at a number of important meetings of trade interests and producers. Many addresses were made at association meetings and conventions.

#### MEAT GRADING AND STAMPING SERVICE

A feature of the service work of the division during the past year was the beef-stamping project which was begun on May 2. Although the division has been grading meat on a commercial scale for the past three years—the New York office alone grading more than a million pounds per month on an average—nevertheless, little if any of this meat was stamped.

An organization known as the Better Beef Association was organized during the year through the efforts of several editors and cattle breeders.

The purpose of the association was to popularize among the consuming public the higher grades of beef, and one of the means used to accomplish this was to so stamp a carcass or wholesale cut that the class and grade would be easily distinguishable even in a retail cut.

To bring about this situation the cooperation of the packers, the National Livestock and Meat Board, and this division was solicited and obtained. A roller stamp was devised suitable for the purpose, and on May 2 a corps of official beef graders began grading and stamping prime and choice grade beef. The service was started experimentally in nine cities—Boston, New York, Philadelphia, Washington, Chicago, Sioux City, Omaha, St. Joseph, and Kansas City.

The work was undertaken for the purpose of determining whether the beef consumers of the country really demand Government certification of grade. Notwithstanding the fact that the service is new, is on a wholly permissive or request basis, and the further fact that the stamping is limited to the two upper grades—choice and prime—a total of 8,214 carcasses, approximating 4,125,000 pounds of beef, was graded and stamped during the first two months of the experiment. The number of carcasses graded and stamped has increased steadily from week to week, and there seems to be good reason for believing that the service is appreciated not only by beef consumers but by most members of the trade who have availed themselves of it. During the time that the service has been in effect there has developed an insistent demand that it be extended to include good-grade steer and heifer beef. Resolutions to this effect were passed by the Kansas State Retail Meat Dealers Association, the Illinois Retail Meat Dealers Association, the New York Retail Meat Dealers, and the National Livestock and Meat Board.

The regular meat-grading service for such institutions as the United States Lines and affiliated steamship companies, the United States Veterans' Bureau, State institutions, and many retail meat dealers has been conducted as in the past except on a constantly increasing scale. Recently a grader has been stationed at New Orleans to provide such service at a number of Gulf ports.

#### OPERATION OF CENTER MARKET

C. H. WALLEIGH, *superintendent*

The operation of Center Market was under the direction of C. W. Kitchen

until January 1, 1927, when he became assistant chief of the bureau.

The policy prevailing in previous years regarding the management and control of the market was continued. Special attention was given to sanitation, as well as to the appearance of the market, attractive arrangement of merchandise, and convenience to the public. Six modern refrigerated counters for the display of dairy products were installed. These will furnish an opportunity for experimental work in testing the practicability of the use of such equipment. Necessary repairs and alterations have been made from time to time, and improvements have been effected in the cold-storage department, which will effect a saving of \$1,000 per annum in operating expenses. It has also been possible to manufacture and sell a larger amount of ice than in former years.

Financial reports from all the stand holders within the market were required as usual. These reports showed gross sales of \$9,661,030.57 (exclusive of the farmers' line and wholesale row). The volume of business done as well as the expense incurred in its conduct was shown.

#### GRAIN DIVISION

H. J. BESLEY, *in charge*

The work of the grain division is divided into two parts, (1) enforcement of the United States grain standards act, and (2) research studies.

The work is directed from the Washington office and through the general field headquarters, Chicago, and the Pacific coast field headquarters at Portland, Oreg. There are 4 division supervisors and 33 district offices of Federal grain supervision. Official standards for shelled corn, wheat, oats, feed oats, mixed feed oats, rye, grain sorghums, and barley were in effect during the fiscal year. In connection with the division's responsibility in connection with the food and drugs act as it applies to grain it became necessary to assign a man to the staff of the general field headquarters to handle the work.

#### BARLEY STANDARDS REVISED

The standards for barley were new, becoming effective in August, 1926, and certain revisions were found desirable. The barley from the Northwest was abnormally wet, on account of wet weather, and failed to meet the specifications with respect to moisture content. This difficulty was most pronounced in connection with the export

tation of barley through Atlantic seaboard ports, principally New York.

In the case of California barley difficulty was experienced in merchandising barley in export because of the practice of exporting barley from California on the basis of San Francisco Chamber of Commerce types. The barley standards operated fairly well in California so far as domestic trade was concerned.

Pursuant to requests from the trade, changes were made in the standards for eastern barley by raising the moisture content from 14.5 to 15.5 per cent in the case of grades Nos. 2, 3, 4, and No. 1 feed barley, and an adjustment in grades 2 and 3 of the requirement for sound barley involving an allowance of 10 per cent of oats in these grades instead of 8 per cent as previously permitted. In the case of western barley the standards were changed so as to provide that the determination of smut in barley be made on the basis of the grain including dockage.

#### CONFERENCES HELD WITH EUROPEAN BUYERS

In connection with problems arising out of administration of the grain standards act, the division leader and a representative of the Bureau of Plant Industry, visited European points. The problems which necessitated this trip were: (1) Complaints registered with this department by the London Corn Trade Association and the Liverpool Corn Trade Association against the inspection of United States grown grain by Canadian Government inspectors at Montreal in cases where such grain was shipped from the port of Montreal in foreign commerce; (2) the problems which have arisen in connection with the exportation of eastern barley through Atlantic seaboard ports on the basis of the new standards for barley which became effective in August, 1926; and (3) problems arising out of the new barley standards as they affected the California crop, with respect to the exportation of brewing barley from San Francisco to consuming markets abroad.

Conferences were held with the Liverpool Corn Trade Association and the London Corn Trade Association and others. It was made clear at these conferences that the United States Government had no jurisdiction over the inspection of grain at Montreal and that complaints against inspections at that port should be properly referred to the Canadian Government. A survey was made of the needs

and requirements on the part of European buyers for barley to be used for malting and brewing purposes. In addition a full explanation was made to buyers of eastern barley as to the intent of this department to change its standards for barley, which changes have since been made.

#### INCREASE IN NUMBER OF APPEALS

The appeal service under the act has been utilized by producers, shippers, and receivers of grain to a greater extent this year than ever before. More than 60,000 appeals were handled in the offices of Federal grain supervision throughout the country, and of this number 1,335 went to board appeal before the boards of review at Chicago and Portland.

Here it should be noted that cargo loadings frequently covering from 300,000 to 400,000 bushels of grain are recorded as a single appeal if the grain is offered as a single inspection lot. Many such cases occurred in the lake loadings during the year.

This demand for Federal service was no doubt occasioned by a desire for final Government determination of grade and the fact that the wheat and corn crops in certain sections presented many difficult grading problems, a large amount of low grade and damaged grain being offered. Fifty-seven per cent of the appeals called were not sustained, and the fees collected in these cases amounted to \$70,851.49, which sum was covered into the Treasury as miscellaneous receipts.

#### LICENSED INSPECTORS AND INSPECTION POINTS

At the close of the fiscal year there were 130 regular inspection points and 24 additional points which were covered. There were 456 licensed inspectors. It was necessary to take disciplinary action against 7 licensees on account of misgrading of grain or other violation of the regulations.

#### MILLING AND BAKING STUDIES

Tests were made on samples of commercial wheats for the purpose of checking milling and baking qualities against the grade assigned by licensed grain inspectors and federal grain supervisors under the provisions of the United States grain standards act. Milling and baking tests were made on 298 wheat samples for the Office of Cereal Investigations, Bureau of Plant Industry, in connection with the development of new wheat varieties hav-

ing superior milling and baking qualities.

Tests were also made for other branches of the department. Approximately 600 samples of wheat from foreign countries representing the principal varieties grown in 33 of the principal wheat-producing countries of the world and 331 samples of commercial wheats from nine exporting countries, which arrived at 15 foreign seaports, were tested for milling and baking qualities for the purpose of comparison with American wheats.

In order that the various types and qualities of wheat produced may be marketed and utilized to the best advantage, a great many studies and experiments have been conducted. A study was made of the types of flour used by the trade for the manufacture of pretzels. Experiments were conducted in order to determine the suitability of certain various types of flour for this purpose. A manuscript containing the results of this study has been prepared and submitted for publication as a technical bulletin.

Cooperation was extended to the American Association of Cereal Chemists in their efforts to standardize the experimental baking procedure.

Correlation studies of kernel texture, test weight per bushel, and protein content for hard red spring wheat were made and the information obtained was prepared for publication in the *Journal of Agricultural Research*. A knowledge of these relationships will aid in a better understanding of the relative value of each of these factors in connection with the marketing of wheat.

Studies were also completed and bulletins published on the relation of kernel texture to the physical characteristics, milling and baking qualities, and chemical composition of wheat, and on the influence of granulation on chemical composition and baking quality of flour.

#### INFLUENCE OF GARLIC STUDIED

Wheat is discriminated against in the markets if an odor of garlic is present. For this reason, preliminary studies have been made of the moisture, oil, and sulphur content of garlic in preparation for an extensive study of the influence of garlic on the milling and baking quality of wheat.

#### CHEMICAL AND LABORATORY TESTS

The rapid oil test previously developed for grading flaxseed was fur-

ther studied and the technic developed so that the test is now applicable to a large variety of products. A study was made of the chemical composition, particularly of the protein content, of a large number of samples of American and foreign-grown wheats. Studies were also started to determine the factors which can be used in grain inspection and in grain handling to determine when wheat is "sick" and unfit for milling and baking experiments and tests, and numerous bulletins were prepared for publication.

#### RICE STANDARDS REVISED

The United States grades for milled rice and for rough rice were revised and each set of revised grades was published in handbook form. Both sets of grades as revised have been adopted by rice-trade associations and rice-inspection departments for commercial use. Investigations pertaining to the standardization of grades for brown rice were continued, and considerable progress was made in this work.

A new rice-investigation office was opened in San Francisco at which point close cooperation was maintained with the California State Department of Agriculture in connection with their rice standardization and rice grading work. Assistance was given rice mills and rice dealers in the establishment and operation of rice testing and grading laboratories. Lectures and demonstrations pertaining to methods for grading rice and to improved methods for handling rice were given in the new rice territory of Missouri and in the rice sections of Arkansas. Numerous articles pertaining to improved methods of handling rice were prepared which were published in various newspapers and farm and rice-trade journals.

#### METHODS PERFECTED FOR DOCKAGE DETERMINATIONS

Investigations and experiments were conducted with a view to perfecting the method of making "dockage" determinations in connection with the grading of wheat and rye under the provisions of the grain standards act. Various makes of dockage-testing machines found on the market and used by licensed grain inspectors were tested for comparative results. A new method was developed for testing the accuracy of the equipment used by grain inspectors for determining dockage in grain.

### GRAIN-CLEANING WORK EFFECTS SAVINGS

Investigations and experiments relative to cleaning grain and rice on the farm and at country elevators were conducted in the spring wheat area and on the Pacific coast. The data obtained in these investigations show that the weed seeds (dockage) which were raised and threshed with the wheat in the four principal spring wheat States of North Dakota, South Dakota, Minnesota, and Montana during the four crop years 1923-1926 had a farm value of over \$26,000,000. Practically all of the weed seeds found in the threshed grain can be readily removed from the grain and the screenings thus removed make valuable farm feed. Assistance was given manufacturers in the development of a new indented belt type of cleaner for attachment to the deck of the threshing machines, an improved type of self-cleaning sieve for threshing machines, and in experiments with other types of cleaners adapted for cleaning grain at the threshing machine and at the farm granary which were developed in cooperation with this bureau. The Bates aspirator developed in this bureau for cleaning grain at the threshing machine was tried out on a rice thresher in California. This experiment was entirely satisfactory, with a result that it has created a considerable demand for this type of cleaner for rice threshing.

Publicity was given to the fact that savings can be made by the producers by cleaning their grain and rice for both seed and market purposes. This information was presented in the form of illustrated lectures, posters, newspaper articles, exhibits, charts, and mimeographed material, and also by means of a special grain train which was run through Minnesota and North Dakota.

### BULK HANDLING OF GRAIN

Bulk grain-handling investigations were continued in the Pacific Northwest. Statistics obtained from these investigations show that a material saving can be made on the farms and at the terminal points in handling grain in bulk rather than in sacks. Wheat exported from Pacific coast ports is now very largely handled in bulk, but the producers in that section still handle most of the grain in sacks. A new office was established at San Francisco, Calif., during the year to assist the grain producers in that State

in changing over from the sack to the bulk method of handling grain.

### WASHING SMUTTY WHEAT FOUND EFFECTIVE

During the past two crop years there has been a large increase in the percentage of wheat which graded "smutty" when it arrived at the terminal markets from country shipping points. Smutty wheat takes a material discount in price when it is sold on the market. The investigations have shown that by washing the smutty wheat in commercial wheat-washing machines a considerable saving can be made in the value of the wheat for milling purposes and that the cost of washing is more than offset by the increased price which the washed wheat brings on the market.

A new simple system was developed for measuring accurately the degree of smut present in smutty wheat for use in the grading of smutty wheat under the provisions of the United States grain standards act. The method consists of washing the smut off from a given quantity of wheat and collecting the spores on a filter paper, which filter disk can then be compared to standard filter disks. This method makes it possible for all inspectors to arrive at uniform results relative to the smut factor in their inspection and grading work.

A new type of sieving machine for inspecting and grading grain and rice was developed. In this machine one or more sieves are held in a movable frame which is operated by a motor. The results from the use of this machine are more accurate and uniform than can be obtained by hand sieves. This device has been adopted by commercial rice-inspection departments for use in grading rice.

A modification of the sample dividing device (Boerner sampler) used in connection with the grading of grain was developed and has come into commercial use in connection with the sampling of grain being loaded into vessels and barges.

### DIVISION OF DAIRY AND POULTRY PRODUCTS

Roy C. Potts, *in charge*

#### DAIRY-MARKETING INVESTIGATIONS

In cooperation with the Oregon Agricultural Experiment Station, a survey was made of the dairy marketing conditions, especially for fluid milk in the Portland market, with respect to

economic changes in production, distribution, and growth of the market milk business. It is contemplated that the report will be published in the near future by the Oregon Agricultural Experiment Station.

In cooperation with the New England Research Council, data were collected, and a brief report prepared on the tank-car and tank-truck shipments of milk and long-distance railroad shipment of cream.

A preliminary study of the milk marketing situation in the St. Louis market milk district was made at the request of the St. Louis Milk Producers' Association and the National Milk Producers Federation. Following the study assistance was given the former organization in revising its by-laws, drafting a new contract with its members, and in determining on a new plan of business operation.

#### POULTRY AND EGG-MARKETING INVESTIGATIONS

An economic survey of the live poultry industry in New York City was made and a preliminary mimeographed report published. This survey was undertaken in cooperation with the New York Food Marketing Research Council and other local agencies. It covered records for a two-year period of the volume, costs, and methods of marketing live poultry, also methods of establishing prices on live poultry. An outgrowth of this study was the organization of a live poultry exchange for which tentative by-laws, trading rules, and live poultry grades were prepared for the Exchange.

A brief survey of the quality of Pacific coast eggs and the demand for them in various channels of trade in eastern markets was made in New York City, Albany, Buffalo, Cleveland, Detroit, and Chicago. The general consensus of the trade was that not a great difference existed.

#### POULTRY AND EGG INSPECTION SERVICE EXPANDED

Notable developments and further expansion of the poultry and egg inspection service occurred during the year. In California and Missouri where the egg-inspection service was carried on in cooperation with the State departments of agriculture, the service was extended to a number of additional shipping points in each State. Four firms at San Francisco and one at New York were authorized to use certificates of quality for U. S. No. 1 extras (retail grade) on their carton eggs.

The number of egg inspections made at Philadelphia and New York showed an increase, especially at the latter city, where during the spring months of 1927, over 500 inspections were made monthly. At Philadelphia one of the cold-storage warehouses utilized the inspection service to ascertain the quality of eggs offered for storage and on which loans were desired by use of the warehouse certificates as collateral.

An important development was the establishment of an inspection service on live poultry at New York City in cooperation with the New York Live Poultry Commission Merchants' Association, and the Greater New York Live Poultry Chamber of Commerce. This service was started in November, 1926, and required a personnel consisting of a supervising inspector and 12 licensed inspectors, 6 of whom were qualified veterinarians. This inspection service involves examination of nearly 12,000 carloads of poultry annually for crop and health conditions, which is required by the New York City Board of Health. It is made in accordance with rules and regulations promulgated by the Secretary of Agriculture and instructions issued by the chief of the Bureau of Agricultural Economics. It is planned to extend inspection work on poultry to include dressed poultry, tentative grades for which are being formulated; also to extend the service to eviscerated poultry intended for use in the preparation of canned poultry food products for export.

#### BUTTER INSPECTION SERVICE HELPS IMPROVE QUALITY

The butter inspection service in Minnesota was continued in cooperation with the Minnesota State Department of Agriculture and during the year more than 80,000,000 pounds of butter were inspected. A further marked improvement in the quality of butter manufactured by more than 400 creameries was noted, the percentage of 93 score butter increasing from 33 per cent in February, 1925, to over 70 per cent in February, 1927. A standard of requirements for butter making, prepared by the supervising inspector in cooperation with the field men of the the association of creameries, was accepted as the guide for the quality improvement work.

#### MONTHLY ESTIMATE OF BUTTER PRODUCTION

With additional funds provided in the appropriation act, monthly esti-



mates on butter, cheese, and condensed milk production were inaugurated in July, 1926. These estimates are now issued about the 20th of each month, while previously the production was not known until the quarterly report was issued. It is of interest to note that for the six months, July to December, 1926, inclusive, the actual production of creamery butter was 691,982,000 pounds, and the estimated monthly production totaled 674,896,000 pounds or 2.53 per cent less for the period, and that the monthly estimates varied only 0.55 to 3.73 per cent from the actual monthly production. These monthly estimates of production of butter and cheese and the monthly reports on condensed, evaporated, and dry milk furnish very timely information regarding the production of the principal manufactured dairy products.

#### FIFTEEN STATES COOPERATING IN COMPILING QUARTERLY PRODUCTION REPORT

Progress was made in the compiling of reports on the quarterly production of manufactured dairy products. Cooperation has been encouraged and at the present time agreements are in effect with 15 States. Under these agreements an agency within the State is charged with the responsibility for collecting dairy statistics. The advantages of the arrangement are the elimination of duplication on the part of reporting firms, more effective follow-up work in the States, which is necessary on account of delinquent firms, more complete statistics for each State, and the publication of more timely statistics. The extension of these cooperative agreements, together with the installation of more thorough methods, should be productive of the most complete and accurate statistics on the production of dairy products which can be produced.

#### MARKET NEWS REPORTS EXTENDED

The principal extension of the market news service occurred at the New York City office, where the service was extended to include live poultry and fluid milk and cream. Daily, weekly, and monthly live poultry market reports are now issued, which, however, do not as yet contain price information. It was the intention at first to include the reporting of prices, but after a very thorough canvass of the situation it was decided that this phase of the work should not be undertaken at the present time. Market reports on live poultry, therefore,

carry only statistical information, together with comments on trading and market conditions.

The market statistics on live poultry at New York City are a new contribution and considerable interest has been displayed in them by the poultry trade. Since these reports were inaugurated there have been many requests for them and at the present time the mailing list for this report is twice the size of any other mailing list maintained at the New York office. Much of the current information regarding live poultry is obtained through the cooperation of the live-poultry inspection office. Daily market reports show the cars available for unloading each day, the intended unloads, actual unloads, the origin of cars unloaded the previous day, and the make-up of cars in terms of percentages of the different classes of poultry. On account of the extreme interest on the part of the poultry trade for this information, blackboards were placed at each of the four live-poultry terminals. Through arrangements with the poultry inspectors at these terminals, current reports are posted each morning which provide the dealers and sellers at each terminal with a more complete picture of the supply situation.

Market reports on fluid milk and cream are also statistical in nature. These reports show the daily receipts of milk, cream, and condensed milk at all terminal receiving stations in the New York City metropolitan area, including information as to the States in which the shipments originated. Supplementing the daily reports are weekly and monthly summaries which with comparative statistics provide valuable information as to the amounts and sources of milk and cream arriving at New York City. Plans for the fluid-milk and cream news service include price reporting which will be undertaken eventually. This phase of the work has not been pushed beyond the carrying of price information in the weekly market comments.

Another addition to the market news service is the quarterly report of stocks of condensed and evaporated milk in the hands of wholesale grocers. This work was suggested by the trade association comprising many of the evaporated-milk manufacturers, and as worked out includes 38 of the more important cities from which condensed and evaporated milk is distributed. Schedules are sent quarterly to wholesale grocers and jobbers in each of these cities, requesting information as to stocks on hand four times

a year. The first report was for March 31, 1927, and the response from the wholesale grocers was satisfactory. This report should be a valuable addition to the statistics on condensed and evaporated milk, particularly after it has been in operation a year so that comparisons will be possible.

There is evidence indicating an increasing interest in the statistics contained in the various dairy and poultry market reports issued. This is shown not only by the large number of requests received and the large mailing lists which it is necessary to maintain, but by the uses to which market reports are put by various branches of the industry. It is known that our condensed and evaporated-milk market reports are used by some manufacturers in developing their sales policies and keeping their jobbers informed. The Philadelphia butter-market reports are used by a large number of southern creameries as a basis for the purchase of butterfat and the sale of butter. At Boston the chamber of commerce has discontinued all of its statistical and price-reporting work on dairy and poultry products and uses the information which is contained in the bureau reports. The Boston reports have been adopted as the price basis by Vermont creameries and as a part of the price basis of the New England Milk Producers' Association. The prices reported at San Francisco are accepted and used as the official price quotations, not only by the local mercantile exchange but by the trade in general at San Francisco and throughout California. The daily and weekly statistics issued at all offices regarding cold-storage holdings have become essential to the dairy and poultry trade, and through them much uncertainty in regard to the statistical position of the market has been eliminated. There is every reason to believe that these reports now have the confidence of the dairy and poultry trade.

#### HANDBOOK OF DAIRY STATISTICS REVISED

A complete revision of the handbook of Dairy Statistics issued by the Bureau of Animal Industry in 1922 has been made by bringing the tables up to date and by including many new tables of statistics. This revision of the handbook will shortly be published.

#### COLD-STORAGE REPORTS

WM. BROXTON, *in charge*

The work of the cold-storage report section consists of compiling and

releasing the monthly cold-storage reports covering such commodities as fruits, dairy and poultry products, meats and meat products; the monthly cold-storage report on fish; and the monthly report of slaughterhouse operations.

The general cold-storage report, in addition to being released for totals of the United States, is published in Crops and Markets by geographic sections. Increasing requests are being made for more detailed figures, and many special tabulations have been published in response to inquiries from the trade.

Reports on slaughterhouse operations are received from 600 meat-packing establishments. From these reports material is obtained which is used in compiling statistics on the production of meats and animal by-products and as the basis for research studies.

#### DIVISION OF HAY, FEED, AND SEED

W. A. WHEELER, *in charge*

#### REVISION OF THE OFFICIAL HAY STANDARDS

Two years' experience in the use of the hay standards indicated the necessity of some changes and the possibility of others which would simplify the application of the standards. Revised standards were prepared, therefore, which were established by the Secretary as the official standards of the United States for hay, effective July 1, 1927. This work required the assembling and study of many samples of hay and numerous field trips to discuss the problems with producers and dealers.

The class "grass hay" was made a separate group and so revised that it will be applied to the grading of the mountain hay of Colorado and Wyoming, Bermuda grass of the South, and all other hays consisting of more than 60 per cent of grasses other than those for which specific standards are provided. The number of special grades has been slightly reduced and those now in effect can be more easily understood. The revision also incorporated in these special grades many of the factors which in the past were shown by additional notations on certificates. Under the old standards, color of timothy was measured by estimating the amount of green area present on the leaf, head, and stems. This has not been entirely satisfactory and during the year studies were made which provided for using the Munsell

system for measuring timothy color as well as for color of other kinds of hay. While this shows no change in the amount of green color permitted in the various grades in the standards, in actual practice it does slightly lower the minimum for color of No. 1 timothy hay. The Munsell method of measuring the color of clover hay and grass hay has also been adopted.

Slight changes were made in the color limits on some grades of the other classes. During the past year there has been a demand for some revision of the grades for grain hay prescribed by the Federal Specifications Board for Government purchases and the addition of a No. 2 grade for each class. After a number of conferences with representatives of the Veterinary Corps and the Quartermaster Department of the Army, the California Department of Agriculture, and others, a new set of specifications was prepared, submitted to the specifications board, and adopted by them.

There is a continuous demand for type samples of the various grades of hay for use in schools, by licensed inspectors, by various agriculture colleges, and by the trade. A large number of types have been distributed during the past year.

#### COLOR INVESTIGATIONS

Work has been done during the past year in adapting the Munsell color system to the measurement of green color in timothy, clover, and grass hay. Plans have already been made for a number of improvements in the color machine and a new machine is now being built on the basis of these plans. A color technologist has been employed, in cooperation with other divisions of the bureau, who has had a great deal of experience in color work. Some studies are being made in cooperation with the Bureau of Plant Industry, of the effect of cutting clover at various stages of maturity on its color.

#### MEASUREMENT OF HAY IN STACKS AND MOWS

In cooperation with the Division of Farm Management and Costs, agreements have been entered into with a number of the agricultural experiment stations to conduct an extended study of the measurements of hay in stacks and mows as compared to the weight of the hay. There has been a large demand for this type of information and it is hoped that formulas for

measuring stacks and mows of all kinds for the various classes of hay will result from this study.

#### HAY-FEEDING EXPERIMENTS

During the year an agreement was completed between the War Department, the Bureau of Animal Industry, and this division, whereby extensive feeding experiments to determine the relative value of various kinds and grades of hay will be conducted. Army animals at large posts will be used for this purpose and the feeds will be paid for from regular Army appropriations.

#### ALFALFA-MEAL INVESTIGATIONS

A beginning has been made on a study of the problems involved in the standardization of alfalfa meal. A number of samples have been collected from various parts of the country and moisture tests made on these samples. Much more work will be necessary, however, before any definite conclusions can be announced.

#### STANDARDS FOR BEANS RECOMMENDED

United States standards for beans were issued as recommended standards September 1, 1926. Soon after these standards were issued they were adopted as the official State standards in Idaho, Montana, and Wyoming. They are being applied in these States under a joint Federal-State inspection service.

The Navy Department, having experienced considerable difficulty during the past two years in obtaining beans that met the desired specifications as to quality, appealed to this office for assistance. As a result Navy contracts were placed for these types on the basis of the United States standards, and U. S. No. 1 grade was made the detailed specifications as to quality.

#### FACTORS AFFECTING QUALITY OF BEANS IN STORAGE

Studies were begun of the factors which affect the quality of beans in storage. As a basis for these studies the Navy Department has made available for sampling by employees of this office all lots of beans stored at supply depots located at Mare Island, Calif., Hampton Roads, Va., Brooklyn, N. Y., and Boston, Mass. Samples also will be drawn from commercial lots of beans at original shipping points and

terminal markets. These studies involve close check and observation of such factors as moisture, damage, acidity, warehouse conditions, temperature, and humidity.

#### SOY-BEAN STANDARDS REVISED

United States standards for soy beans were issued in revised form, effective September 1, 1926. The revisions made were based on the results of the application of the standards issued in 1925 and on further studies of the soy-bean industry. The most important change was the addition of a "super" grade designated U. S. Extra No. 1 to take care of high-grade stock for which there is a demand from the seed trade.

#### HAY INSPECTION

The hay-inspection service has continued to increase during the past year. At the end of the year there were 91 designated and licensed inspectors as compared with 72 the preceding year. The service has been extended to the States of Wyoming and New Mexico during the past year and considerably increased in Texas and Nebraska, new inspectors having been licensed at Fort Worth, Clint, and Houston, Tex., and at several shipping points in Nebraska. During the past year six schools were held at various points for the training of additional inspectors.

As a result of the further extension of the service, two new supervision divisions were established, one in the Mountain States with headquarters at Salt Lake City and another on the Pacific coast with headquarters at San Francisco. New supervisors were employed to take charge of these divisions.

The number of inspections during the past year has shown a gratifying increase. The total number of inspections made during the year was 17,161, an increase of about 15 per cent over the preceding year.

The cordial relations with the various Government departments purchasing hay have continued through the present year as in the past, considerable work being done with the Army to develop a more suitable ration for Army horses and to provide for the advantageous handling of controversies about the quality of hay delivered on Army contracts. The present arrangements are that wherever possible final decision in these controversies rests with this bureau. The quartermaster

general states that the Army has made a saving of approximately \$415,000 on its purchases of forage during the past year as compared to the preceding year. This is partly due to prices being somewhat lower during the past year but mostly due to savings on account of better buying and inspection methods inaugurated in cooperation with this bureau. The Bureau of Efficiency recently has recommended that the District of Columbia have all hay purchased by them inspected by this bureau upon delivery.

#### BROOMCORN INSPECTION

As a result of the small beginning in this work made in Oklahoma in 1926, an inspection service of considerable size has been developed in that State during the present year. Two schools for training inspectors were held at Oklahoma City in cooperation with the Oklahoma State Market Commission. At the present time there are eight inspectors licensed in cooperation with the State of Oklahoma. Inspection service for broomcorn was also established last winter for a short period at Wichita, Kans.

The total number of inspections during the year was 10,931 bales as compared with 826 bales during the preceding year. The Oklahoma department expects to extend the service which it is operating in cooperation with this bureau to the western part of Oklahoma during the coming year and it is probable that some work can be done also in New Mexico and Colorado.

#### BEAN INSPECTION

An inspection service for beans was started in the fall of 1926 in the intermountain States of Idaho, Colorado, Wyoming, and Montana. Since that time Federal bean inspectors have also been stationed at San Francisco, San Antonio, Salt Lake City, and Atlanta. The inspectors in the intermountain States provide Federal inspection for practically all of the bean-producing territory of that section.

#### SOY-BEAN INSPECTION

The soy-bean inspection service was established two years ago with inspectors at several shipping points in North Carolina and at Richmond, Va., and Chattanooga, Tenn. During the past year the service was extended to two of the large receiving markets in Illinois and to Norfolk, Va. and Atlanta, Ga., and considerable increase in the demand for inspection from re-

ceivers has been noted. The entire volume of inspections shows an increase of approximately 50 per cent over that for the preceding year.

#### SEED STOCK RECORDS AID IN VERIFYING ORIGIN

The United States Department of Agriculture and State experiment stations are doing intensive work to determine the adaptability of various kinds of seeds from different sources. They have already learned, for example, that Italian red clover does not do well in the United States, that alfalfa seed from Arizona is not adapted for sowing so far north as Kansas, and that Tennessee anthracnose-resistant red clover is the best strain for the southern part of the clover belt, where resistance to disease is the main consideration. Because origin of certain kinds of seed is apparently of importance and influences the price at which they sell, false information with regard to origin is often given. Staining as provided for under the Federal seed act protects the alert buyer against the substitution or misrepresentation of imported red clover or alfalfa for domestic seed, but during the past five years only about 15 per cent of the alfalfa and 20 per cent of the red-clover seed sown in this country were imported. This division has reached the conclusion, after intensive study in the field, that a system of complete records which preserves the identity of the seed, from the time it is received from the grower until it leaves the seedsman's warehouse, together with outside supervision, would go a long way toward insuring that the correct information as to origin would be passed on to the buyer.

Seed-stock-record studies, started last year, have been continued. About 60 seedsmen have been visited and approximately 250 record forms obtained from them. These forms have been studied, and the best features incorporated in model forms such as receiving, bulking, stock, shipping, and invoice records. A limited number of these forms have been supplied to the seed trade for suggestions.

The work on seed-stock records which was presented at the second seed-marketing conference held in Chicago, received the indorsement of that conference, and later also that of the International Crop Improvement Association and the Wholesale Grass Seed Dealers' Association (now known as the Farm Seed Association of North America). These organizations recommended that the work be continued,

and that a complete system of inspection and verification of stock records of seed handlers wishing to sell verified-origin seed be devised. Such a system has been devised, and tentative provisions covering the verification of origin and identity of seeds were drafted, and submitted to interested seedsmen in attendance at the seed-trade convention in June, 1927, in Detroit. A sufficient number of seedsmen have already indicated a desire to participate in the proposed seed verification service to warrant going ahead with the plans and making the service effective as early as possible.

#### SEED-REPORTING SERVICE

The seed-reporting service was of assistance to the Red Cross flood relief office in Memphis in locating supplies and in keeping in touch with prices of cottonseed, seed corn, and forage-crop seeds, so that "up-to-the-minute" market information could be given to county Red Cross chapters.

The special reports on vetch and ryegrass seed were continued, and elicited favorable comments from far-Western growers and Southeastern consumers. During the year 109 mimeographed seed reports were distributed. As in the past, the same four main kinds of reports were issued, namely, outlook, price and movement, shipment, and weekly seed reviews. In addition, retail prices in March, April, and May, a prospective-demand report on March 11, and a retail-seed-sales summary on July 16 were issued.

#### GRAIN, HAY, AND FEED MARKET NEWS

The effectiveness of the grain, hay, and feed market news service was materially increased and the service was extended to several new areas. The development of better statistical data in the Washington office, together with increased efficiency in the field offices, has resulted in a material improvement in the character of the various market reports and reviews prepared by the division. The service was also strengthened by the more critical analysis of market data and by the addition of several important market contacts, particularly for the procuring of much-needed foreign-market information.

Effort was directed toward a more effective distribution of the service in the principal agricultural areas, and this was accomplished with practically no additional cost to the bureau. Approximately 600 regular market re-

views with definite dates of issue were prepared during the year and more than 250 daily or weekly market reports giving brief market summaries and current quotations on the principal commodities were issued on regular schedules.

Newspapers and radio stations continued to be the principal publicity agencies. More than 300 newspapers, with over 5,000,000 circulation, mostly in the farming areas, published the various reviews regularly. Large farm journals carried semimonthly or monthly reviews to their several hundred thousand subscribers. The principal radio stations throughout the country broadcast the weekly reviews and many of the daily reports.

Approximately 4,500 banks located in the central and northwestern grain-producing States are assisting the bureau in disseminating the information carried in the weekly grain, hay, and feed-market reviews, by posting the reviews on their bulletin boards and incorporating pertinent parts of the reports in their communications to their farmer patrons.

Nearly 600 cooperative elevator managers have requested the weekly grain-market reviews, and in most instances have expressed their intention of posting the report for the benefit of their customers.

#### WORK OF BRANCH OFFICES BROADENED

The market news work in the branch offices at Minneapolis, Chicago, and Kansas City, was broadened to more effectively serve the agricultural interests of the surrounding States. From Minneapolis a special grain-market news service featuring quotations on wheat on the basis of protein as reflected in the price paid for the different types of grain in that market was furnished to the Northwestern States. The special feed-market news service developed in the Minneapolis office in cooperation with the State Department of Markets in Wisconsin was extended to Minnesota. Additional special reports have been inaugurated at Chicago and Kansas City.

#### ADMINISTRATION OF THE UNITED STATES WAREHOUSE ACT

H. S. YOHE, *in charge*

#### TEN YEARS UNDER THE WAREHOUSE ACT

August 11, 1926, witnessed the tenth anniversary of the passage of the warehouse act. Progress during the first

four and one-half years was slow, as was evidenced by the fact that on April 1, 1921, there were licensed only 238 cotton warehouses with capacity to store but 429,975 bales of cotton, 56 grain warehouses capable of accommodating 2,108,400 bushels of grain, and 5 wool warehouses with capacity for 24,375,000 pounds of wool.

Marked progress has been made since 1921, not only in the tremendous increase in the warehouses licensed for the storage of the commodities originally covered by the law but in the addition of new commodities to the list of products eligible for storage.

The warehouse capacities licensed under the act on June 15, 1927, were as follows:

Cotton-----	bales--	2,711,050
Grain-----	bushels--	36,738,364
Wool-----	pounds--	27,966,250
Tobacco-----	do--	558,216,000
Peanuts-----	tons--	10,478
Broomcorn-----	bales--	1,000
Beans-----	hundredweight--	205,547
Potatoes-----	do--	243,328
Strap-----	gallons--	200,000
Dried fruit-----	hundredweight--	7,972,720
Canned foods-----	cases--	1,097,000
Cottonseed-----	tons--	7,500

#### ADDITIONAL PRODUCTS ELIGIBLE FOR STORAGE

On June 11, 1926, canned foods (fruits and vegetables) were made eligible for storage under the warehouse act. This action was taken in response to demand from various parts of the country. Large warehouses in Maryland, Indiana, Illinois, Virginia, Iowa, Missouri, Arkansas, and Oregon have been licensed and additional applications are pending. A very substantial increase is expected in this field during the coming year.

On August 24, 1926, regulations for the storage of prime cottonseed were promulgated. This action was taken at the instance of growers of cottonseed, cottonseed-oil interests, and bankers. That the department's regulations for the storage of this product make for sound collateral is evident from the ruling made by the Federal Reserve Board shortly after the promulgation of the regulations that bankers' acceptances, secured by cottonseed properly stored in a Federally licensed warehouse, are eligible for rediscount at Federal reserve banks.

#### SPECIAL INVESTIGATIONS

While the work in connection with the administration of the warehouse act consists primarily in the licensing of warehousemen, inspectors, graders, and weighers, and in enforcing the law

and the various regulations thereunder, it becomes necessary for a proper administration and extension of the law to new commodities to make various investigations. No product can safely be added to the eligible list until studies have been made to determine best practices followed in the storing of the particular product and until regulations are drafted to control the storage of the product. During the year, in answer to repeated demands, special studies were made with a view to ascertaining whether frozen berries and farm seeds might be added to the eligible list.

Special investigations have also been made in the field of grain warehousing, largely with a view to improving and perfecting present methods. These studies related particularly to improving methods for sampling bulk grain in elevators and to developing adequate records for houses operating under the law.

## STANDARDIZATION WORK

### TOBACCO STANDARDS

Under the warehouse act authority is granted to develop standards and grades for various products. For several years tobacco standardization work has been in progress. One outstanding accomplishment in this field during the past year was the completion of United States standard sizes for determining length of tobacco. Under these standards provision is made for six different series of sizes with variations suitable for measuring and stating the length of all types of American-grown tobacco. The results of this work appear in Department Miscellaneous Circular No. 83, entitled "United States Standard Tobacco Sizes."

During the year standard grades for Burley tobacco were also prepared and issued. Of all types of American-grown tobacco, Burley is produced in the largest amount. Important revisions were also made in the grades previously issued for eight other types. Investigations are now in process to develop standard grades for Maryland tobacco.

### CANNED-FOODS STANDARDS

Following the placing of canned foods on the eligible list for storage under the law, it soon became apparent that there was a real need for standardization work in this field if warehouse receipts were to be of real service. What one canner of tomatoes may

pack as a fancy grade another would regard as an extra standard grade, while a packer of first-class products would regard the same product as of standard grade only. Such variation in grading causes confusion and does not permit the banker to accept receipts on the basis of grades stated thereon. Besides, it forces the housewife to buy brands rather than goods on the basis of quality. With a view to improving this condition, studies have been made to develop proper grades for various canned fruits and vegetables. At this time tentative standards have been drafted for canned tomatoes, peas, corn, and stringless beans, and others are in process. In this work the department is working closely with the trade and canners' associations, and it is receiving whole-hearted support.

## AMENDMENTS TO REGULATIONS

During the year a number of amendments were made to the various regulations. An amendment made to the regulations for warehousemen storing sirup permits the storage of sirup in bulk in large tanks provided such sirup is held at a certain temperature.

The grain-warehouse regulations were amended by substantially increasing the fees collected by the Government for original inspection of warehouses. Prior to this amendment the fee was at the rate of \$1 for each 10,000 bushels storage capacity. It is now \$2. The minimum fee before amendment was \$5. It is now \$10. The maximum fee was \$50 regardless of the capacity. It is now \$100.

## SOME BENEFITS FROM THE LAW

In the flooded areas in Mississippi there were several licensed cotton warehouses which suffered heavily. Some of these houses had large stocks of cotton. With a view to protecting the various interests and to salvaging as much cotton as possible a Federal receiver was appointed for several houses. Both the receiver and the salvage company requested the department to furnish its records and to assist in making adjustments. The department's records were accepted by all parties as accurate and dependable, and they were of great assistance in effecting proper settlements.

From different sections of the country reports reach the department as to the increasing value and acceptability of Federal warehouse receipts for loan purposes. The standing these receipts have attained is resulting not only in

cheaper money but in money in certain centers being made available which was heretofore denied to agriculture. In certain grain-producing States grain loans supported by Federal warehouse receipts have been made at rates as low as  $4\frac{1}{2}$  per cent. and the bankers were actually seeking this type of paper. In one grain banking center money was reported offered at  $3\frac{3}{4}$  per cent.

In the dried-fruit areas of the Northwest a cooperative growers' organization which placed its fruit in licensed warehouses in the past year was able to avail itself of money as low as 5 per cent through the intermediate credit bank, and the local banks also when offered the Federal warehouse receipt voluntarily reduced their rates to this organization from 8 to 6 per cent. Another cooperative growers' organization packing fruit and vegetables found 5 per cent money instead of 7 per cent when it offered the Federal warehouse receipt as collateral.

With the Federal warehouse receipt as security it should be an easy matter for anyone entitled to a loan for marketing purposes to secure ample credit at reasonable rates. Too frequently, however, organizations attempt to secure loans on the basis of warehouse receipts which under certain conditions would fail as collateral. In too many instances the warehouse set-up is not of such a nature as to afford independent custodianship of the product represented by the receipt. In such cases, even though the local banker, knowing the person who wants the loan to be reliable, may make the loan, he finds that he can not pass the paper supported by such warehouse receipts along for rediscount. The rediscounting banks—Federal reserve and other banks—are insisting on disinterested custodianship of the product represented by the warehouse receipt.

### STATISTICAL AND HISTORICAL RESEARCH

O. C. STINE, *in charge*

The primary aim of this division is to collect useful statistical and other historical data, and to analyze agricultural economic problems so as to provide a better basis for working out national agricultural policies, and to provide farmers with economic information useful in deciding what to produce and when to market their products. The outstanding developments of the past year have been made in

the field of foreign competition and demand and in price analysis. Regular monthly economic reports dealing with cotton, wheat, and tobacco, and general economic conditions as they affect the purchase of agricultural products in continental Europe have been established. Crop and market reports by United States consuls have been expanded. A beginning has been made in the study of measures by foreign countries to control production or stabilize the marketing of agricultural products. In price analysis progress has been made in the development of a better understanding of the relations between agriculture and industry.

### FOREIGN COMPETITION AND DEMAND

In the past year regular monthly economic reports dealing with the consumption of and conditions of the market for cotton, wheat, and tobacco in practically all of continental Europe have been put upon a substantial basis. These reports, prepared by the Berlin office, are being supplemented by additional information from other sources concerning the production, consumption, and market conditions in other countries and issued as special monthly reviews. Reports dealing with fruit and with general economic conditions are also being continued and expanded. Information from China, collected by the representative of the bureau sent to the Orient, has also made a valuable contribution to the current surveys of foreign crop and market conditions. In the past year the United States has had unusually large quantities of apples and cotton to market. By means of reports from the European representatives the bureau has been able to keep in close touch with market conditions and to keep the interested parties informed as to the movement of these products into consumption. The United States has also had large quantities of wheat and tobacco to market and through its representatives in Europe and China the bureau has been able to keep in close touch with the markets for these commodities and to keep producers and exporters better informed than ever before of consumption and of market requirements.

Believing that a knowledge of measures undertaken by foreign governments and cooperative agencies to control the production or the marketing of agricultural products would be useful in developing policies for the United States, an attempt has been made to collect all available informa-



tion concerning such measures. Preliminary analyses have been made of the control of the production and marketing of sisal in Yucatan, of rubber in the East Indies, currants in Greece, and cotton in Egypt. The delegate of the United States to the International Institute of Agriculture, upon the request of this bureau, visited Egypt and made a special study of government regulations with reference to cotton production and marketing. This study has been mimeographed under the title "Government Measures to Aid Egyptian Cotton Growers." He is also making a study of the Greek currant control. Information on this subject has also been contributed by another representative of the bureau traveling in New Zealand and Australia. There is an opportunity for a large amount of work in this field, and the results may be very useful in avoiding repetition of experimental errors and shaping an effective policy for this country.

The foreign crop and market reporting service has been further developed along practical lines. The official crop and livestock reports cabled by the International Institute are being supplemented by special reports from consuls and representatives of the Department of Agriculture in foreign countries. The agricultural commissioner in Berlin has cabled weekly reports of European weather conditions affecting the prospects for crops. These reports have been more comprehensive than information available from any other source. Among the most valuable reports received in the past year have been grain collections and crop conditions in Russia, which in the past year has been a factor of some importance in grain markets of Europe. The agricultural commissioner sent to China has also made timely and valuable reports with reference to the rice market in Japan, the condition of the market for American tobacco in China, and supplies of eggs and peanuts being produced in China for United States markets. The political disturbances in China have increased the importance of having a well-trained agricultural observer in the country to report conditions, both as to production for United States markets and prospects for marketing American products in China.

The United States consuls at certain posts are also performing a very practical service in reporting prices and shipments of products from foreign countries to the United States, where they compete with domestic products. In the past year the weekly

reporting of the Bradford wool market by the United States consul at Bradford was inaugurated. The continuation of the reporting of shipments of onions from Spain and Egypt to the United States has proven to be a valuable service for the producers and shippers of onions from different parts of the United States to the large Atlantic coast markets. The cables from consuls state the quantity of onions, name of ship, and probable arrival, and have been found to be both timely and reliable. A similar service has been started with reference to shipments of corn from Argentina. Plans are being made for reports from the consuls on the west coast of Mexico on the production of early vegetables in that region and shipments to the United States. Cables are received from the consul in Sicily on the price of export lemons at Palermo and monthly exports to the United States.

The number of reports issued during the year was increased over the past year, the special foreign-service reports increased in number from 260 to 290, and the mailing lists for these reports increased from 3,000 to 6,000. The demand for these special commodity reports increases as the service becomes better known.

An issue of foreign Crops and Markets, containing current reports and results of research, has been prepared each week. The circulation has increased moderately and now amounts to nearly 2,500. This is not a large figure, but it should be remembered that this publication is primarily for research workers and others who may make further use of the material in republication. Many comments received indicate that it is meeting a real need by making available a large amount of basic statistical and other historical information along with up-to-date world crop and market developments.

In some cases it seems very important to have a fairly accurate indication of the outturn of crops in important countries in advance of the official estimates. Many countries are late in making official estimates of crops. Earlier estimates or forecasts of production in important countries would improve the accuracy of early estimates of world production and enable producers in the United States to make their marketing programs earlier in the season and with more certainty as to world market developments. Climatic data and condition reports are being analyzed to provide a basis for forecasting wheat crops in advance of

the Government estimates in India, Italy, France, Germany, Argentina, and Australia. The results obtained thus far have been quite satisfactory. In the past year, for example, the Government estimates of the Argentine wheat crop were anticipated by one month, the calculated forecasts being very close to the later official estimates. The outturn of crops in France and Germany also have been estimated fairly accurately several months in advance of the Government estimates.

Research in the field of foreign demand promises some valuable results. An analysis is being made of Cuban imports to determine the principal factors affecting Cuban purchases of agricultural products. It has been found that the value of Cuban exports of sugar has a very close relationship to purchases of agricultural products. Further analysis shows that variation in the value of Cuban exports affects some agricultural products much more than others. It seems greatly to affect the imports of fruits, for example, but not very much the imports of wheat flour. This study is being made not only to provide a basis for estimating or forecasting Cuban purchases, but also as an experiment in analysis of foreign demand for agricultural products. As this experiment is completed, similar studies will be made of other foreign countries.

Another line of research is the collection of information as to the effect of import duties, ocean freight rates, and quarantine restrictions upon the foreign markets of the United States.

#### AGRICULTURAL INCOME

Research continues to improve the estimates of income from the agricultural production of the United States. All the different items are reexamined each year and brought up to date. Plans have been made in cooperation with other divisions to estimate income by States on the same basis as the estimate for the United States.

Agricultural income declined this year (1926-27) after a continuous improvement from 1921 to 1925. Gross income declined \$600,000,000. This reduction was due mainly to the decline in income from cotton but to some extent also to a decline in the income from grains and fruits and vegetables. The income from livestock increased slightly. Income available from capital, labor, and management per farm family declined from \$922 for the year 1925-26 to \$853 in the year 1926-27, which is about the same as for the year 1924-25. Between January, 1926,

and January, 1927, the current value of farm property declined \$1,500,000,000, and on January 1, 1927, amounted to approximately \$58,000,000,000, as compared with \$79,000,000,000 in the year 1919-20. The rates earned by farmers on net current value of farm property (current value less value of property rented from and debts owed to nonoperators) declined from 4.3 in 1925-26 to 2.7 per cent, the lowest rate since 1923. The wage earnings of the average farm family in relation to the level of 1919-20 continue to be less than those of a hired farm hand and considerably less than those of a factory employee.

It should be noted in this connection that there is considerable variation in the incomes of farmers. Another study of farm incomes in 1926 based on actual reports by 13,475 farmers indicates that after taking into account changes in inventory the receipts exceeded the expenses by \$1,500 or more on about 25 per cent of these farms, while on 11½ per cent of the farms the receipts were not sufficient to cover expenses.

#### PRICE ANALYSIS

The commodity-price studies are being continued. The purpose in each case is to understand prices and measure the influences of different factors in causing price changes. A preliminary study of cotton prices has been completed and a bulletin entitled "Factors Making the Price of Cotton" has been submitted for publication. Studies of the price of corn, apples, wheat, wool, and dairy products are now under way. Representatives of this division with representatives of several other divisions have continued the preparation monthly of the price situation for publication in Crops and Markets and for distribution to State statisticians and economists who are preparing special reports of this kind for their respective States.

Some advance has been made in a study of the relation of agriculture to the business cycle. It is believed by some that one of the most important factors in the business cycle is the variation in agricultural production due to factors over which the farmers have little or no control. It is assumed by many that there is a very close relationship, some saying that there can not be business prosperity without a prosperous agriculture and others that business prosperity is essential to a prosperous agriculture. Continuation of business prosperity through the past few years with the continuation of an agricultural de-

pression has raised some doubt as to their being a close relationship. A careful analysis of farm prices in relation to business cycles over a long period of years has shown that in earlier periods as well as in recent postwar years business has been prosperous for periods of several years, while agricultural prices remained relatively low. The explanation seems to be that cheap food and raw materials contribute to the prosperity of urban workers in many industrial lines, especially those which have a large and expanding urban market; and that, on the other hand, weakened agricultural purchasing power hurts a few industries such as fertilizers and farm machinery, which depend largely or almost entirely upon the farm market. After a period of some length low prices may check expansion of agricultural production, while the demand for agricultural products continues to increase, and then unfavorable seasons cause short crops and high prices for the food and raw materials furnished by agriculture. Such periods in the past have usually been accompanied by or closely followed by a business depression. It seems, therefore, that both the accumulated results of an agricultural depression and seasonal production cycles are important factors in causing business depressions. It is also evident that a business depression reduces the demand for some agricultural products, particularly raw materials used in industries that are depressed, and it may, by reducing the purchasing power of consumers, reduce the demand for such products as butter and beef. But it is also evident that while business prosperity may increase the demand for certain agricultural products the elasticity in the demand for these products is not sufficient to guarantee agricultural prosperity.

#### TRANSPORTATION

Major emphasis in the transportation research has been given to the preparation of material requested by farmers' organizations and others engaged in presenting transportation problems before the Interstate Commerce Commission. In addition to the preparation of such material, however, index numbers of freight rates on wheat and livestock have been completed. These index numbers cover many representative points and are believed to be fairly accurate measures of the changes in the rates upon which the bulk of these commodities move.

A comprehensive study of the transportation of cotton was also begun. Data as to cotton movements and rates have been collected. The purpose is to construct an index number of freight rates on cotton and to describe completely the handling of cotton in transportation.

#### HISTORICAL RESEARCH

Historical research continues to collect information for use in the analysis of causes of shifts and changes in agricultural production and income. A new development in the past year has been the collection, in cooperation with the States, of prices farmers received in Maryland and Virginia covering a long period of years. From the records of farmers, mills, stores, and from old newspapers, prices have been collected in Maryland back to 1851 and in Virginia back to 1880 with some records covering earlier years. These data are being compiled so as to provide a continual series of prices for the important commodities and index numbers of prices farmers receive for the products they have to sell. It is expected that the results will be useful in explaining shifts that have taken place in agriculture, in studying the effects of prices upon production, and in indicating probable future developments of production in these States. Several other States are interested in this project. Work also was continued on a cooperative project with the State of Montana in the study of the history of the early development of the cattle industry in that State. For next year a study of the lifetime experience of the farmer in relation to his environment, including the effect of local, national, and international developments upon his type of farming and income is planned.

#### DIVISION OF AGRICULTURAL FINANCE

NILS A. OLSEN, *in charge*

The work of this division covers problems in credit, taxation, and insurance, in so far as these pertain to agriculture.

#### RURAL CREDIT

The work in rural credit has included an inquiry into the sources, costs, and problems involved in production credit for cotton growers. This inquiry was made by means of a questionnaire addressed to lists of growers in the 10 more important cotton States.

Intensive local studies of all forms of credit used by farmers, and of various factors affecting the need, cost, and availability of credit, have been made in cooperation with State agricultural institutions in North Carolina, South Carolina, Georgia, and Oklahoma. A similar project has also been inaugurated in Arkansas. In these local studies the cost of credit to individual farmers has been related to the type of farming, size of farms, sources of credit, degree of self sufficiency of the farm with reference to food and feed supplies, and kind and length of tenure. Financial relations of landlords and tenants have been studied, as have also the relationships of credit to cooperative enterprises of farmers. Special consideration has been given to merchant credit and the possibilities of substituting for such advances more economical credit from banks and other specialized credit institutions.

A special study of livestock credit in Montana was made during the year in cooperation with the State agricultural college. This study, while applying specifically to the livestock districts of Montana, will give information of interest also to other livestock sections and particularly to such sections in neighboring States. In a large part of Montana, livestock is the basis for all production credit. Crop mortgages from grain-and-livestock producers are, as a rule, considered merely supplementary security.

In connection with local field studies in the States mentioned, the operations of agricultural credit corporations organized specifically to obtain discounts from the intermediate credit banks have been given special attention. A nation-wide study of such corporations is planned.

#### FARM TAXATION

Studies in farm taxation have in the main been conducted in cooperation with State agricultural colleges. Bulletins summarizing the results of such studies in Missouri and North Dakota have been issued by the cooperating agencies during the year. Each of these bulletins sets forth the relationship between the rent and taxes of a large number of farms in the States concerned. The tax systems of the States are analyzed and certain revisions are suggested to make these systems more equitable from the farmer's point of view.

Progress has been made on cooperative studies in Colorado, Massachusetts, Michigan, Oklahoma, and South

Dakota. An intensive study of taxation in Michigan has resulted in the preparation of a bulletin which concerns the tax burden on agriculture and on other industries. This bulletin is one of a proposed series covering various aspects of the tax situation in the State. The work in Oklahoma has reached a point where results can be summarized, and summaries of the material secured in Colorado have been released to the press. Preliminary work has been done on a cooperative study in Virginia, where the Virginia Polytechnic Institute and the University of Virginia are cooperating and working with the bureau in a comprehensive survey of the State's tax system. Plans are under way for the initiation of several other State projects at the beginning of the new fiscal year.

Data have been gathered from farmers in all the States concerning changes in farm taxes since 1924. These figures will make possible an estimate based on census figures of the volume of farm taxes in the United States for the years 1924, 1925, and 1926, and will indicate those sections where material changes in farm taxes have taken place. A study of the relationship between taxes and cash rents in one or two counties in each of the more important agricultural States has been begun. The results of this study will be compared with material gathered for the year 1919, and will give a clear indication of changes that have taken place.

#### AGRICULTURAL INSURANCE

A special study of recent developments in farmers' mutual fire insurance was made. The 1,950 companies in this class now carry insurance on farm risks in the aggregate amount of about \$10,000,000,000, which covers approximately one-half of all farm property in the United States insurable against fire. The average annual cost of this insurance is about 26 cents per \$100 of risk. The opportunities of these local mutual companies to serve as conservation agencies as well as economical loss distributors by encouraging and promoting the elimination of fire dangers from the properties insured are very great. If the best methods and practices already in use by the more progressive of these mutuals were generally adopted, the cost of insurance would be greatly reduced and much property would be conserved.

During the year the division has contributed to the consideration of

farmers' insurance problems by State associations of farmers' mutuals, as well as by the National Association of Mutual Insurance Companies. Special assistance has been given to the work of a committee on farm fire protection working under the auspices of the National Fire Protection Association.

Data have been gathered also on hail, crop, livestock, and automobile insurance for farmers, with a view to making such information generally available. Assistance and advice has been furnished upon request to State farm bureaus, officers of farmers' mutuals, and others, on problems of agricultural insurance. One of the most striking recent developments in the field of insurance protection for farmers is that of mutual organizations to carry farmers' automobile insurance. This development has been limited largely to the Middle West. The insurance covers fire, theft, collision, property damage, and public liability, or, in other words, all the special hazards involved in the ownership and operation of automobiles. The cost of such protection in these new farmers' organizations has thus far been remarkably low.

## DIVISION OF COOPERATIVE MARKETING

CHRIS L. CHRISTENSEN, *in charge*

Research, educational, and service work with farmers' cooperative associations became a specific Government activity, through the cooperative marketing act, approved July 2, 1926. The act provided for the establishment of the division of cooperative marketing in the Bureau of Agricultural Economics and for enlargement of the department's research, educational, and service work relating to cooperative marketing of agricultural products, cooperative purchasing of farm supplies, and other cooperative activities among farmers.

The work of the new division is based upon the needs of the expanding cooperative movement, and its practical application to the problems of the associations is kept in the foreground. Research projects and service work undertaken by the new division have been carefully designed to assist farmers and their cooperative associations with problems of organization, management, financing, merchandizing, and membership relations. Business technique and marketing methods evolved by farmers' cooperative enterprises are being analyzed and studied by marketing specialists. These analyses cover

the operating methods and experience acquired by cooperative associations marketing dairy products, livestock, grain, wool, fruits, vegetables, cotton, and other agricultural commodities and the results of each study are made available to guide cooperatives along safe business lines. As the principles which make for success in cooperative business become better understood, we may look for a more efficient performance of marketing service by cooperatives.

## SERVICE AND ADVISORY ACTIVITIES

In response to requests made personally, by mail, or by wire, by farmers and cooperative associations, the division is constantly furnishing information and advice with respect to the organization, management, and operation of cooperative associations.

Through its extensive contacts with cooperative associations and its study of their many problems, the division assembles a great many valuable data which are helpful in determining the policies of cooperative associations.

In addition to consultations with the directors and management of existing associations the staff has been called upon to assist and advise committees representing groups of agricultural producers who are contemplating organization. In many cases the division has been in a position to bring to the attention of the organization committee much valuable data bearing upon the economic problems surrounding the production and marketing of their product, and the form of organization structure and operating methods best adapted to the marketing of their particular commodity.

## RESEARCH STUDIES

The research work of the division is directed along four major lines: (1) Study of the development of cooperative associations marketing particular commodities. These studies of the cooperative effort in each commodity group are historical, descriptive, statistical, and economic. (2) Business studies of individual cooperative associations which have been operating over a period of years. In these studies a detailed critical analysis is made of the organization, membership relations, pooling and accounting methods, financing, management policies, and merchandizing practices of individual associations, and of the external economic factors which affect their operations. The aim is to study, by the case method of research, the econom-

ics of cooperative organization and operation. Endeavor is made also to accumulate source data which will lead to the development of standards of business efficiency for cooperatives. (3) Research in legal phases of cooperative organization, financing of cooperatives, membership relations, and educational methods. (4) Studies of cooperative purchasing of farm supplies.

The results obtained from these studies may be published as bulletins, released in mimeographed form, given in great detail to the organizations immediately concerned through correspondence or personal conferences, or used in formulating general principles for the benefit of other organizations similarly situated, the type of publicity depending upon the individual case.

#### COOPERATIVE MARKETING OF FRUITS AND VEGETABLES

An economic study of the prune industry in Oregon and Washington was completed in April, 1927. This study was undertaken at the request of the prune growers, cooperative associations marketing prunes, other packers and distributors of prunes, and the agricultural experiment station and extension service department of the Oregon Agricultural College.

This study involved (1) determination of the factors influencing consumption of the product, (2) a study of the markets and distributing machinery, (3) consideration of the factors affecting production in this area and in competing areas here and abroad, and (4) determination of the present and probable future output of the product. The analysis which was made points the way to a sound program of production and marketing that should result in placing the industry upon a more satisfactory basis. Other divisions of this bureau and The New York Food Research Council assisted with the study.

#### COOPERATIVE MARKETING OF GRAIN

Two grain-marketing studies of major importance have been conducted, one concerning the wheat pools; the other, farmers' elevators.

It was felt that the activities of the Canadian wheat pools were of such importance and of such interest to farmers in this country that a careful analysis of their organization set-up and methods of operation should be made and the results of the investigation made available to those interested. This study traces the develop-

ment of cooperative activities in the marketing of Canadian grain since the opening of the grain-producing region of the Prairie Provinces. It shows the contribution of each period of development to succeeding developments, and particularly to the wheat-pool movement. The operations of the large cooperative elevator companies and of the present wheat pools are discussed in detail. A feature of the study will be a comparison of the development of cooperative grain marketing in Canada and in the United States.

The second study concerns farmers' elevators in the United States, and was conducted in cooperation with the State colleges and experiment stations of Montana and North Dakota. A group of farmers' elevators in Montana, North Dakota, and Minnesota were selected for study. Analyses of the expense of operation, hedging practices, effect of protein content, and other quality factors on returns, storage practices, and relation of side-line business to the handling of grain have been made.

The information obtained has been presented to a large number of officials of farmers' elevators through personal contacts, and through addresses and discussions at their State and national conventions. Such contacts have been made with representatives of approximately 100 organizations.

#### COOPERATIVE MARKETING OF DAIRY PRODUCTS

Research in cooperative marketing of dairy products has included the collection of data on a number of the important types of cooperative fluid-milk-marketing associations. The completed study will include a description and comparison of the organization set-up and operating methods of the various associations, their historical background, and economic analyses and discussions of individual associations and the environment in which they operate. Special attention is being given to the equity of pooling methods and price plans and the effect of the latter in controlling seasonal variation in production and the leveling out of periods of excessive and insufficient production.

At the request of 25 dairy cooperatives in the New England States a study was made which involved an economic survey and analyses of the facts surrounding the production and marketing of fluid milk throughout New England with special reference to

their cooperative marketing. The growth and development of the Boston milk shed, the source of New England's milk supply at the present time, its seasonal change in flow to market and the manner in which it flows were presented. The existing cooperative and other marketing machinery through which the marketing of milk is carried on at present was described. The study presents also analyses of fundamental economic facts dealing with the causes of changes in the supply and demand for milk and the factors influencing these changes. Possible economies that might be effected by the unification of existing facilities are pointed out, and the question of the optimum-sized unit is discussed. The question of competition with other areas, particularly the possibility of western supplies of cream in the New England market is given consideration.

#### COOPERATIVE MARKETING OF LIVESTOCK

The division has in its employ a specialist who has had practical livestock-marketing experience as well as training in economics, who is working closely with livestock cooperative associations for the purpose of enabling them to increase their efficiency. This work is making available valuable information on successful cooperative livestock-marketing practice. A study is being made of the organization, operating methods, and problems of cooperative livestock associations, including both the local shipping associations and the terminal cooperative commission agencies.

This division has cooperated with the livestock division of this bureau and with the Iowa State Agricultural College in a study of direct shipping and selling of hogs in Iowa. In this study schedules were prepared for reload stations, interior packers, and livestock producers. In the reload station and packer schedules particular attention was given to operating practices of these buying agencies, including the methods of handling hogs and of determining prices paid to producers. In the shippers' schedule an effort was made to find out how many hogs the farmer fed and where and to whom he sold them, as well as the extent of competition among the various buying agencies for the farmer's hogs.

#### COOPERATIVE MARKETING OF WOOL

Representatives of 29 of the leading cooperative marketing associations, representing approximately 38,000 wool

producers who market approximately 30,000,000 pounds of wool, met with officials of the department February 11-12, 1927, for the purpose of developing a program of research, service, and educational work relative to the cooperative marketing of wool. This conference was called by the Secretary under the provisions of the cooperative marketing act.

The first project undertaken in cooperative marketing of wool is a year's study of wool production and marketing in Australia and New Zealand. The wool specialist who was employed to conduct this study sailed for New Zealand and Australia in March, 1927. His investigations will involve a thorough survey and analysis of the practices and methods of wool marketing in Australia and New Zealand. The importance placed by the Australians on wool types for production purposes, the shearing of the fleece and the manner in which it is handled, and the system of centralizing wool and its shipment to the large markets are being studied. The functions and operations of the Australian Wool Council are also being studied. The purpose of these studies is to acquire information which can be applied to the cooperative marketing of wool in this country.

#### COOPERATIVE MARKETING OF COTTON

The division's work with the cotton associations has involved both research and service. Early in the year a report was made to the cotton associations on the attitude of the New England manufacturers regarding the cooperative marketing of cotton. Reports were made on the operations of the Staple Cotton Cooperative Association and on a membership study of two cotton associations.

In response to the increasing interest in cooperative gins among cotton growers and their cooperatives and the demand for information on organization and operating problems, the division has made a number of studies of cotton-gin operation in Texas and North Carolina. Studies have also been made of a group of 12 cooperative cotton gins in northwest Texas and of the development of cooperative cotton gins in Georgia as subsidiary or associated units of the Georgia Cooperative Cotton Growers' Association.

Close contact has been maintained with the cotton associations. Assistance has been given especially in connection with the problem of education

in the principles and practices of cooperative marketing. Approximately 30 special reports, including statistics, bulletins, and other material, were prepared and sent to the associations during the year as a part of this service program.

#### COOPERATIVE MARKETING OF TOBACCO

Studies were begun during the year on the cooperative marketing of tobacco. Information was gathered by a representative and preliminary reports were prepared on the cooperative marketing of tobacco in Maryland, in Wisconsin, and in the Miami Valley of Ohio, as well as a general report on the cooperative marketing of Burley tobacco. A membership study covering two tobacco-marketing associations was made also and the results of this study were published.

#### COOPERATIVE-BUSINESS ANALYSES

That phase of the research program dealing with detailed critical studies and analyses of individual cooperative associations is yielding most encouraging results and is commanding great interest among cooperative officials and directors. The results of these cooperative-business studies are also being widely used by colleges in their courses of instruction in cooperative business. These studies not only afford data for intensive research in cooperative business but give opportunity for the development of research methods which are proving of aid to cooperatives in studying their own problems.

A study of the joint-sales arrangement whereby the deciduous fruit of the California Fruit Exchange is sold through the sales organization of the California Fruit Growers Exchange was begun in June, 1926, and was completed during the year. This study was undertaken at the request of the board of directors of the California Fruit Growers Exchange, as it afforded an opportunity to make an intensive study of a joint-sales arrangement which has been in operation for over 25 years, and to reach conclusions which will be of value in service work with cooperative-association managements who are giving consideration to the possibilities of the joint use of sales organizations in the marketing of the associations' products.

On completion of the study a detailed report was made to the board of directors of the California Fruit Growers Exchange in which was stated the conclusion that during the period of

operation of this joint-sales arrangement its operation had been beneficial to the interests of the members of both the California Fruit Growers Exchange and the California Fruit Exchange. The report was published by the California Fruit Growers Exchange for immediate distribution to the members of the boards of directors of the affiliated associations forming the exchange.

At the request of the board of directors of the Poultry Producers of Central California a business analysis of their organization was undertaken. The study embraces a brief analysis of the production side as found in California, and a very careful scrutiny of the operating methods and costs and other matters pertaining to the association's operations, together with a price analysis of the San Francisco egg market. It was found necessary also to include a very complete analysis of the New York egg market and of the interdependence of this and other large markets, inasmuch as New York seems to be the principal market in the determination of egg prices. A number of consumers, jobbers, and retailers in New York City were interviewed with the purpose of understanding the demand for Pacific coast eggs sold through the Pacific Egg Producers, a joint-sales agency operated by several Pacific coast cooperative egg-marketing associations.

At the request of the board of directors of the Producers' Livestock Commission Association, of National Stockyards, Ill., an analytical study is being made of the organization and operation of that association.

#### MEMBERSHIP RELATIONS AND FIELD SERVICE PROBLEMS

Among the most serious problems of cooperative marketing associations are the holding of adequate membership and securing the loyalty and intelligent support of their members. A study of the membership relations of cooperative associations marketing cotton and tobacco was made in cooperation with the Agricultural Experiment Station of the University of Kentucky.

Research work was begun in membership relations and field-service problems of cooperative associations handling fluid milk. This work has been conducted in the area of four of the larger associations by means of personal interviews with members and nonmembers in the territory served by these associations. This work has been conducted with the hearty coop-



eration of the associations and the agricultural colleges in the areas studied. It was designed to obtain information on which to build more effective field service and educational-extension programs. The agricultural colleges and the cooperative associations are now arranging educational material for use in correcting conditions revealed in these studies. This work has promoted a closer relationship between some of the agricultural colleges and the cooperative associations.

#### LEGAL PHASES OF COOPERATION

During the past year over 50 articles on legal decisions and related subjects have been prepared and published in *Agricultural Cooperation*. A mimeographed preliminary report, entitled "Cooperative Associations and Subsidiary Corporations," was issued. Assistance has been rendered cooperative associations and those interested in cooperation on their legal problems and the legal specialists of the division have participated in an advisory capacity in a number of important conferences. The revision of Department Bulletin No. 1106, entitled "Legal Phases of Cooperative Associations," is nearing completion.

#### FARMERS' COOPERATIVE OIL ASSOCIATIONS

The division, in cooperation with the University of Minnesota, completed a study of 41 farmers' cooperative oil associations that were active in 1925, 39 of which were located in Minnesota and 2 in adjacent territory. Data covering the organization, financing, management, and costs of operation of these companies were collected, largely through personal visits to the stations. The results of the study have been presented in a manuscript now ready for publication as a circular entitled "Organization and Management Problems of Cooperative Oil Associations in Minnesota."

#### EDUCATION AND EXTENSION IN COOPERATION

In the development of the cooperative movement there is an urgent need for the extension of the principles and practices of cooperation among farmers. The cooperative marketing act authorizes the division to promote the knowledge of cooperative principles and practices and to assist agricultural colleges, extension services, and cooperative associations in working out a comprehensive educational

program in cooperative organization among farmers.

Efforts have been made to meet this need by promoting, in cooperation with the agricultural colleges, extension services, and the cooperative associations, short-time schools through which the principles and practices of cooperation are presented. These two or three day schools on cooperative marketing are usually held under the auspices of the agricultural college and extension service, with the various cooperative associations in the State and the division of cooperative marketing cooperating. The programs are especially designed for officials, directors, and field men of cooperative associations and others who are working to direct the cooperative movement in the State. The instructors are marketing specialists of the colleges, leaders of the associations, and representatives from this division.

Two new films, *Cooperative Marketing—Pacific Coast Eggs*, and *Cooperative Marketing in the United States*, have been added to a series of educational films designed for use by cooperative associations, extension workers, and others engaged in teaching cooperative principles and practices. A number of film-strip slides for the purpose of illustrating lectures on cooperation have been developed.

Arrangements have been made with the extension service whereby the division will make available the services of one of its cooperative marketing specialists for extension work in cooperative marketing. The aim is to assist in a closer coordination of the work of the extension services toward extending the principles and practices of cooperation among farmers.

#### HISTORY AND STATISTICS OF COOPERATION

The library on cooperation was enriched during the year by copies of several thousand financial statements and printed reports from cooperative associations. The files now contain data from approximately 11,000 active cooperative associations including information as to form of organization, management, membership, volume of business, financial status, and operating methods.

The biweekly circular, *Agricultural Cooperation*, was published during the year and carried material relating to the status and activities of cooperative organization among farmers. This source material is being used widely by association house organs, farm journals, and the general press. A

number of publications have been issued, including a 100-page bulletin presenting the historical development and present status of cooperative organization among farmers which was prepared from data collected from 10,803 active associations for the year 1925.

### **DIVISION OF FARM POPULATION AND RURAL LIFE**

C. J. GALPIN, *in charge*

With the passage of the Purnell Act, 1925, legalizing expenditure of Federal funds for "such sociological investigations as have for their purpose the development and improvement of the rural home and rural life," new impetus has been given to studies of farm population and rural life. "Farm population" statistics are rapidly replacing in public print the unmeaning "rural population" figures. The "farmer's standard of living" has become a serious topic of interest. The "movement of population to and from farms" has not only gripped public attention but has become an important index of broad economic conditions, since the reports on farm population have become reliable and clear in meaning.

#### **RESEARCH STUDIES**

Thirty-five cooperative studies have been carried on during the past year in conjunction with State agencies. Thirteen of these have been made under the provisions of the Purnell Act, receiving the approval of the Office of Experiment Stations, and sharing in the benefits of the funds provided by this act. Undoubtedly, the use on the part of experiment stations of these increasing funds has made possible a more thorough-going type of research.

#### **DIRECTORY OF TEACHERS IN RURAL SOCIOLOGY**

The directory of persons teaching rural sociology in colleges and universities of the United States was issued October 1, 1926. Names of 615 teachers of rural sociology appear in the directory. This list is one of our active mailing lists.

#### **NEW QUARTERLY PUBLICATION**

A new quarterly publication was started during the year, entitled "Farm Population and Rural Life Activities," which is a review of current research and other related proj-

ects of this division and of institutions and agencies cooperating. This publication has proved to be very popular, the requests to be retained on the mailing list having come in 100 per cent.

#### **MOVEMENTS OF POPULATION TO AND FROM FARMS**

A survey of the movements of people to and from 25,000 farms in the United States indicates that during the calendar year 1926 there was a net loss of 649,000 persons from farms. After this survey 20,000 farm operators who had left farms for cities were circularized. A report on the character of these operators and the reasons for their leaving the farms has been prepared. Ten thousand farm operators who left cities for farms and are now farming were also circularized, and a report is being tabulated now on the character of these persons and the reasons for their movement to farms.

#### **INSTITUTE OF METHODS OF RURAL SOCIAL RESEARCH**

An institute at Purdue University was held April, 1927, for sociological research workers, to which this division contributed both by exhibits and by representatives at the institute. This institute indorsed the work of this division and requested more assistance for the various research workers at experiment stations in the States in planning and carrying out their research projects.

#### **INTERNATIONAL COUNTRY LIFE CONFERENCE**

The leader of this division was present at the International Country Life Conference in Brussels, Belgium, and represented officially there the United States Department of Agriculture. He also made a survey of country life research and living conditions in 13 countries of Europe over a period of six months, and was influential in bringing to this country the International Country Life Conference, which met at East Lansing, Mich., August 1, 1927. Considerable time has been spent with foreign embassies and legations in Washington in preparation for this conference.

#### **FARMER'S STANDARD OF LIVING**

Work is being done toward working out the principles governing the attainment and maintenance of a satisfactory standard of living on the farm.

The farmer needs expert assistance in planning for a wise expenditure of the rural community's money, as well as in the making of money. The masses in the cities have such experts on various lines of consumption and consequently spend their income to social advantage.

A study was completed during the past year on the farmer's standard of living which analyzed the living conditions of 2,886 white families of selected localities in 11 States. The results of this study were published and met with wide interest, reviews and special articles based upon the study being published by a large number of agricultural journals and other papers. Inquiries and comments received by the bureau indicated a need for much additional information along this line.

### ECONOMICS LIBRARY

MARY G. LACY, *Librarian*

The library has continued to maintain broad contacts with workers in the field of agricultural economics, especially those of the agricultural colleges and State departments of agriculture, with other agricultural interests, other branches of the Government service, as well as with the general public. Active cooperation has been maintained with the Oklahoma Agricultural and Mechanical College and the University of California. Oklahoma detailed an employee to the library of this bureau, and California paid the salary of a person to work on indexes of the agricultural data relating to their respective States. It is possible that arrangements will be made with other States for similar work, which will be of value both to the States and to the Federal department.

In addition to preparing large volumes of material for the use of research workers in this bureau, much assistance is given to agricultural workers throughout the country in answering inquiries and supplying available data for their use. Of particular value to research workers are the bibliographies and selected lists of references which are prepared in the library.

A series of agricultural economics bibliographies is being published which covers a wide range of agricultural problems. These are meeting a very definite demand, as they furnish the research workers with a ready access to information relating to the problems upon which they are work-

ing. One of this series, prepared under the direction of the librarian, entitled "Price Fixing by Governments, 424 B. C.-1926 A. D.," received a national prize offered for the best bibliography in the field of agriculture and related sciences.

### DIVISION OF LAND ECONOMICS

L. C. GRAY, *in Charge*

#### LAND RESOURCES AND LAND UTILIZATION

Study of the census returns on land utilization and work on the preparation of a report showing regional changes in land utilization since 1920 has been continued, and compilation of statistical data for a study of the trend of land utilization since 1880 by agricultural regions has been in progress.

The preparation of maps and other material relating to the classification and utilization of land in the Great Plains region is approaching completion. Field work required in the preparation of the natural vegetation and carrying capacity maps was completed in cooperation with the Bureau of Plant Industry. A large map showing the distribution in detail of crop, pasture, and forest land in the United States was prepared for the Sesqui-Centennial Exposition. A detailed soil map of the United States has been completed, in cooperation with the Bureau of Soils, for publication in the Atlas of American Agriculture issued by this bureau.

Surveys of settlers' progress and land utilization in sample areas of the southern Great Plains were completed, and work was continued on a study of the cut-over portion of the Great Lakes States. Studies of the trend of consumption of agricultural products in relation to the probable future need for crop land are in progress.

#### REGIONAL PLANNING STUDIES

A series of regional planning studies in regions of indeterminate land utilization have been initiated with a view to determining what lands should be used for crops, for pastures, and for forests; and to indicate what policies, public and private, will promote the most effective utilization of the land. Field work in two of these studies, one in northwestern Colorado and the other in West Virginia, is being carried on during the summer of 1927.

**LAND SETTLEMENT AND RECLAMATION**

As a result of field studies completed last year in cooperation with the Bureau of Public Roads to determine the economic limits of cost of water for irrigation, six additional preliminary reports of the studies of several projects covered have been issued. The final report covering these studies has been submitted for publication.

Field work on a study of the extent to which land in drainage enterprises has been brought into cultivation and is producing the means of meeting the obligations undertaken to cover cost of its reclamation, begun last year in cooperation with the Bureau of Public Roads, has been completed.

An important phase of the land-settlement work deals with methods used by States and private individuals and agencies in inducing settlement on lands that have not been used for agriculture. Studies have been made of the methods used by private land-settlement agencies in classifying the land offered for sale. This work also has for its purpose the development of methods that will promote definite policies of utilization for lands now unused or misused.

**LAND TENURE**

A study was made of the characteristics of all farms in the United States 1,000 acres and over, based on a first-hand tabulation of data available in the census schedules for 1925. The results of this study will show for the first time the size, distribution, location, and economic characteristics of such farms.

A report on the changes in farm ownership and tenancy for 1920 to 1925, based on an analysis of results of the census returns, was issued, and also two bulletins dealing with the ownership of rented farm land.

During the latter part of the year a study of land tenure in relation to land utilization was begun in middle Georgia, a region where a large number of farms have been abandoned and a large proportion of the crop land has gone out of cultivation. The study is designed to indicate what steps are requisite to the restoration of more nearly normal conditions in this region.

A study was also undertaken in order to determine the relationships between tenure, range control, and the utilization of land for grazing purposes. This project is based on the assumption that a policy for Federal public lands which would be suitable

in one region of the West might not apply to conditions in other regions. It is designed to illustrate the diversity of conditions and consequent requirements as to policy.

**LAND APPRAISAL AND LAND VALUES**

A survey of conditions in the farm-lands market was published for the first time as *The Farm Real Estate Situation*. By summarizing the available data on farm real estate values, earnings, taxes, "turnover" or volume and kind of transfers of title, including foreclosures, the publication aimed to give a basis indicative of trend and outlook to the owners of the country's 6,000,000 farms and to the various financial agencies directly concerned with farm real estate values. Response to the first report indicated that continuance of such an annual survey is needed.

Tabulation was begun of the cash rental data obtained by the 1925 census. These data, when summarized, will provide a significant index of the earnings of farm real estate and their relation to value for large areas of the country in which cash renting is common enough to serve as a representative measure of what a year's use of a farm is considered to be worth.

Studies of the effects of various local factors influencing farm land values have been continued in cooperation with the Bureau of Public Roads, with the object of developing methods of appraising land values as a guide to purchase and sale, assessment for taxation, and credit policies.

The analysis of long-time records of land prices from county sales records and other sources was continued. In these studies an attempt is made to measure the influence of various factors on the trend of such prices in selected farming areas.

A study of the effect of various local factors on land values in the cut-over counties of the three Lakes States is in progress in cooperation with the Minnesota Agricultural Experiment Station.

After a thorough study of all available data, an index of the value of farm real estate, taking improved farms as a unit and extending back to 1912, was prepared.

**FARM LABOR**

In order to obtain more adequate information concerning the perquisites received by farm laborers and the importance of such perquisites in supplementing farm wages and promoting

greater stability of employment, a questionnaire relating to casual farm hands was widely circulated. The returns supplement information concerning noncasual hands obtained the previous year. The results of these questionnaires are being prepared for publication.

Other studies now under way include agencies of distribution of farm labor in 12 Northeastern States, the farm labor supply and demand, farmers' methods of handling labor, and general farm-labor conditions in those States; monthly variations in amounts of family and hired labor on farms; statistical tabulation showing portion of farm population engaged as hired labor and the relation between the agriculturally employed population and the area of land and the value of farm property by census enumeration districts; and expenditures for farm labor and the part of production going to meet farm-labor expenses.

## DIVISION OF ECONOMIC INFORMATION

J. CLYDE MARQUIS, *in charge*

The critical changes in agriculture have created a remarkable demand for facts on the business and economic side of farming. This need for reliable statistics and interpretations has been growing since the agricultural depression, but not until the last year or two have agricultural and industrial agencies begun to turn to bureau information for the most accurate indication of the condition of the farm situation. This new demand necessitates constant changes to adapt the facts in character and form to the needs of those who use them and an increasing variety of publications is needed.

The general plan of economic information distribution of the bureau now involves, (1) immediate release as news; (2) complete copies of reports in mimeographed form; and (3) a final permanent publication in periodicals, bulletins, or the Yearbook of the department.

The press and radio are the outlets for this quick distribution of news. There follows immediately a call for the complete reports, however, and it is necessary to make them available as soon as possible for those who desire details regarding certain States and regions or classes of products. Such details are too lengthy to be included in the first brief reports. These reports are sent to special mailing lists. Finally, all reports are assembled into more permanent publications where they may be available for reference.

During the past year a plan of publication has been worked out to correlate the various forms of information into a chain of related forms which will make it easy for anyone to keep informed on the progress of agriculture. This chain includes the daily market and news releases, weekly and monthly reviews, weekly and monthly periodicals, annual bulletins and Yearbook statistics, and a series of comprehensive statistical bulletins which carry the figures back as far as available. Supplementing these publications, handbooks of wide variety have been planned and several are issued.

Along with means of rapid distribution, better forms of presentation have been developed in handling the material. The production of charts and graphs has been greatly increased, which has involved a large amount of drafting and reproduction in printed form. The use of charts and graphs by extension workers and farmers is growing steadily and few publications are considered complete until they have been fully illustrated by charts. Thousands of copies of charts made by bureau workers have been distributed during the year in the form of photographic prints, rotoprints, and in mimeographed charts. Equipment has been installed to increase greatly this form of distribution during the next year.

Through the economic chart service two lines of development are being pushed. First, charts of an historical nature showing price changes for a number of years, changes in production, movements, storage, and prices are being made and assembled in series by commodities. These charts can be easily kept up to date from current sources by those who use them so that this chart work will not need to be repeated frequently. Another series will deal with the price situations on a shorter time period, showing several factors in relation to each other to the end of illustrating the interrelation of various factors and how they affect prices. The photographic chart service has been conducted on a cost basis, nominal charges being made for quantities of prints as ordered.

## PRESS AND PUBLIC CONTACTS

With the growth of news-distributing agencies more and more of the press releases of the bureau are handled through correspondents who visit the bureau daily to gather the information. Many of these agencies now maintain constant contact with the bureau and give special attention to

preparing their own exclusive articles on subjects in which they are interested. These articles are frequently adapted to the particular locality in which the subject is of special interest and are distributed quickly by wire by the special correspondents. Regular distribution of press releases has continued, as in the past, with some increase in number, although the individual articles have been condensed to conform with the growing pressure upon the space in the newspapers.

The preparation of regular market articles for farm papers and newspapers by members of our staff has been considerably increased during the year, and the distribution of these articles amounts to many millions in trade and economic journals. Sixty-one special signed articles were prepared by specialists of the bureau staff and accepted for publication in outside periodicals. Of these, 15 were written by the bulletin editor of the bureau and several others by members of the staff of the division.

Through contacts with special writers and correspondents and Washington representatives of various agricultural organizations, many articles have been outlined and material provided which has resulted in a wide distribution of bureau information. Many commercial and agricultural organizations send their representatives regularly to the division to secure facts by conference, which gives further distribution to crop and market information through the house organs of these agencies.

#### RADIO MARKET NEWS SERVICE

The use of radio as a means of distributing spot market news as well as general educational information on crops and markets has been extended during the year. Additional funds made possible the extension of the leased wire to Ames, Iowa, on July 1, 1926, where an extensive program of market news broadcasting was begun by station WOI at the Iowa State College. The college provides a market news editor and announcer and has been able to provide the producers of that State a very complete and quick service.

A similar market news broadcasting program was set up at Oklahoma City in cooperation with the State market commission and radio station KFJF. A drop of the leased wire was installed, providing at that office all the information available on the south-

western branch of the Federal system. The opening of new livestock market news offices in Buffalo, Cleveland, Pittsburgh, Cincinnati, and Indianapolis has greatly strengthened the service to livestock men in the Central States area.

The rearrangement of radio matters by the Federal Radio Commission made but slight changes in the general broadcasting of market news. The commission gave careful attention to the special needs of stations that were serving the agricultural industry and in several instances authorized changes in wave length and power to facilitate this work. The most complete voluntary cooperation has been received from almost all of the private broadcasting stations which generally recognize the service value of this information to producers and the trade. Late in the year the closing of station KFKN at Hastings, Nebr., deprived some producers of radio reports, but station KMMJ at Clay Center then volunteered to take over this service, and this to some extent has replaced the station formerly operated at Hastings. The drop of the leased wire was removed from Hastings to Clay Center to provide the reports. A canvass of listeners to these stations gives indisputable evidence of the value of radio market reports in that territory. Through conferences with representatives of several of the larger stations programs have been revised and enlarged, and plans have been made for a more complete market schedule to be inaugurated in the fall.

A survey of the number of radio sets on farms made through county agricultural agents in cooperation with the department radio service and the extension service early in the year showed that the estimated number of radio sets on farms had more than doubled since 1925, increasing from an estimate of 553,000 sets on farms in 1925 to 1,252,000 sets on farms in 1927.

The bureau has contributed economic material regularly to the farm radio school conducted by the department, including summaries of various crop situations, economic discussions by specialists on many subjects, and brief news items on the development of the crops, changes in market requirements, standards, and prices.

#### PERMANENT ECONOMIC PUBLICATIONS

The output of the bureau in the form of permanent bulletins and circulars of

a technical nature has exceeded any previous year by 14 titles. The largest increase was in department bulletins, of which 25 were issued compared with 16 the previous year. Several of the newer series of economic bulletins have been materially increased, the series of statistical bulletins having increased from 13 to 20, including a series of five price bulletins.

In addition to the printed reports of results of bureau work 36 preliminary reports have been issued and 67 miscellaneous reports and papers have been completed.

#### ECONOMIC PERIODICALS

The regular periodical has been found to be one of the best means of distributing economic information. Crops and Markets, a monthly statistical summary of the crop and market information gathered by the bureau, is now the principal periodical of the department for a permanent record of its work. With the end of December, 1926, the weekly edition of Crops and Markets was discontinued, since it had largely been replaced by other quicker forms of distribution, and the delays in printing and distributing it rendered a printed form of little value. Most of the material which formerly appeared in this weekly is now assembled into monthly tables, which appear in the monthly Crops and Markets.

For extension workers The Agricultural Situation was changed to a printed publication in January, 1927, issued by the department, and a subscription price of 25 cents per year was placed upon the periodical for those not cooperating with the department. This form places this valuable material in more compact and convenient form for ready reference. The mimeographed periodical, State and Federal Marketing Activities, has been continued for the benefit of State and Federal workers in this field. Foreign Crops and Markets is issued weekly, containing summaries of information from foreign sources. Agricultural Cooperation is issued semimonthly, carrying the news of progress and the development and changes in cooperative marketing and related lines.

A new mimeographed quarterly, Farm Population and Rural Life, was begun this year to provide a means of distributing summaries of the work in this field to the growing numbers of technical workers which has resulted from the increase in research projects under the Purnell Act. Agricultural

Economics Literature, which was formerly a supplement to the Bureau of Agricultural Economics News, has been published as a separate monthly since January, 1927. This provides a very useful and comprehensive reference source to new literature on this growing subject.

#### ECONOMIC EXHIBITS

The bureau has contributed more extensively than in the past to the preparation of exhibits of its work, distributed through the department office of exhibits. An extensive display of bureau work was prepared for the Sesquicentennial Exhibition at Philadelphia, and the display was maintained from July to December. This exhibit was then dismantled, and many of the materials have since been shown elsewhere. The bureau participated in the National Dairy Exposition at Detroit by providing materials for 6 out of 15 units shown by the department. At the International Livestock Exhibition a number of displays were presented, including several new features. Bureau material was included in several of the fair circuit exhibits in the Central States.

A new form of small, portable display material has been developed and is being reproduced for distribution to meetings of producers of various commodities. Special displays were prepared for the American Farm Bureau Federation exposition at Chicago in December and for several other interstate meetings.

An increasing number of visiting groups of producers and the trade, including representatives of the dairy industry, cotton industry, etc., have required the preparation of special displays in Washington to present the work of the bureau in condensed, graphic form. Delegations of business men, the Pan American Standardization Conference, the national encampment of 4-H club boys and girls, and the visit of delegates to the World's Poultry Congress were instances of this character.

#### MOTION PICTURES AND SLIDES

Two new motion-picture films were completed this year and added to the 22 previously made on the work of the bureau. These films were Cooperative Marketing in the United States, and A New Method of Harvesting Cotton. Scenarios of four other films have been written and some of the work of production begun.

Several series of lantern slides have been completed and reduced to film strips for use in the small film projectors by lecturers. This form of pictorial material is found to be very useful in extension work, and many subjects will be reproduced in this form in the future.

#### PHOTOGRAPHIC LABORATORY

The increased use of charts and other photographic material has in-

creased the demands upon the photographic laboratory, which have been met by increasing the facilities of this unit by the addition of more modern appliances. Enlarging apparatus, rotoprint-making equipment and film-slide instruments have been added. This unit has also contributed materially to the preparation of exhibit materials in the form of painting in color, photographic tinting, and enlarging.