Clemson University
3 1604 013 657 764

Digitized by the Internet Archive
in 2013

http://archive.org/details/newreclamationer18unit

I27.5: 1927

NEW RECLAMATION ERA

VOL. 18 JANUARY, 1927 NO. 1

Clemson College Library

MAKING HOGS OF THEMSELVES ON AN IRRIGATED FARM

Clemson College Library
Government Publications

RECLAMATION

IT IS INCREASINGLY EVIDENT that the Federal Government must in the future take a leading part in the impounding of water for conservation with incidental power for the development of the irrigable lands of the arid region. The unused waters of the West are found mainly in large rivers. Works to store and distribute these have such magnitude and cost that they are not attractive to private enterprise. Water is the irreplaceable natural resource. Its precipitation can not be increased. Its storage on the higher reaches of streams, to meet growing needs, to be used repeatedly as it flows toward the seas, is a practical and prudent business policy.

The United States promises to follow the course of older irrigation countries, where recent important irrigation developments have been carried out as national undertakings. It is gratifying, therefore, that conditions on Federal reclamation projects have become satisfactory.

The gross value of crops grown with water from project works increased from $110,000,000 in 1924 to $131,000,000 in 1925. The adjustments made last year by Congress relieved irrigators from paying construction costs on unprofitable land, and by so doing inspired new hope and confidence in ability to meet the payments required. Construction payments by water users last year were the largest in the history of the bureau.

The anticipated reclamation fund will be fully absorbed for a number of years in the completion of old projects and the construction of projects inaugurated in the past three years. We should, however, continue to investigate and study the possibilities of a carefully planned development of promising projects, logically of governmental concern because of their physical magnitude, immense cost, and the interstate and international problems involved. Only in this way may we be fully prepared to meet intelligently the needs of our fast-growing population in the years to come.

—From the Message of President Coolidge to Congress
December 7, 1926

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 JANUARY, 1927 No. 1

Interesting High Lights on the Reclamation Projects

ADVANCE crop reports for the season of 1926 are coming in to the Washington office and so far, except on the cotton-growing projects, show a marked increase in the value of crops per acre over 1925.

GRAPEFRUIT on the Mesa division of the Yuma project were being picked during the month, and 125 boxes were taken off approximately 2½ acres of 3½-year old trees. The 10 acres in this tract will yield approximately 1,000 boxes, or a little over a box to the tree.

ORANGE growers on the Orland project had a very successful season. The first consignment of fruit caught an early market and brought attractive prices of $4.25 to $4.75 a box.

ACTIVE steps are being taken by the Ambursen Dam Co. on the construction of Stony Gorge Dam, Orland project. The company has sublet the hauling, sand and gravel pit operations, excavation, and camp operations.

CONTRACT payments due from the Palisade and Mesa County districts, Grand Valley project, were paid promptly on the due date, December 1. Credit is due the directors of the district who made the payment possible by improved business methods.

THE Orland Unit Water Users' Association collected and remitted to the local fiscal agent the sum of $46,510.20 as partial payment on the construction instalment due December 1. The total amount due was $66,552.92.

THE Huntley project reported the best average crops grown on the project for some years, the average return being $42.41 per acre compared with $38.57 in 1925. Sugar beets averaged 11.06 tons per acre.

AMONG the water users on the Sun River project there are signs of increased prosperity. A number of old debts have been paid off, and many of the farmers have purchased farm equipment and livestock. A noticeable number of new automobiles were purchased last fall.

THE final weights of sugar beets furnished by the sugar factory showed an average for the Lower Yellowstone project of slightly under 10 tons per acre. The average sugar content was 15.53.

AT Guernsey Dam, North Platte project, concreting of the north spillway has been completed and work has begun on concreting the south spillway. At the end of November the dam was 86.8 per cent completed, based on gross earnings.

THE Truckee-Carson irrigation district has voted in favor of taking over the operation and maintenance of the Newlands project by 345 to 141, giving 21 votes over the necessary two-thirds required by law.

TURKEY growers on the Newlands project received the highest prices paid on the coast last year for their birds, local turkeys being recognized generally to be of superior quality. The total pre-Thanksgiving and Thanksgiving sales from the project amounted to approximately 125,000 pounds, representing about one-third of the salable crop. The total crop to go on the market will bring the growers about $170,000.

THERE has been considerable discussion on the Rio Grande project of the formation of marketing associations, and owing to the low price of cotton, farmers are generally turning their attention to plans for more diversified crop production.

THE Milk River project reports the following record yields of sugar beets: From a 20-acre tract, 18 tons per acre, part of the tract yielding in excess of 22 tons per acre; from a small tract farmed by the Utah-Idaho Sugar Co., 26 tons per acre. The sugar company has made a first payment of $6.50 per ton.

FARMERS on the Belle Fourche project are well pleased with the returns from the sugar-beet crop, and as a result it is expected that the acreage will show a material increase next season if prices remain favorable.

THE use of electricity in rural homes is increasing rapidly in the Yakima Valley and on the Sunnyside and Tieton divisions of the Yakima project. There has been an increase of 20 per cent in the last year, the power company building 52 miles of line to reach 400 rural homes. The power company supplying the Yakima Valley now has 250 miles of high-voltage or primary lines and an equal amount of low-voltage line. Twenty per cent of all the company's customers live in rural districts, and the use of electrical power among the rural population of the valley is high in comparison with other sections of the country.

SHIPMENTS of agricultural products during November from the Shoshone project comprised 364 cars, including 281 cars of sugar beets very largely loaded by the sugar company from storage piles, and 52 cars of alfalfa meal.

THE Powell Creamery, Shoshone project, purchased 11,900 pounds of butterfat during the month and manufactured 14,700 pounds of butter and 125 gallons of ice cream. The Frannie division shipped 800 gallons of cream.

24718—26

121852

Ten-Year Construction Program for Federal Reclamation

If adopted, the program would provide for a total expenditure of $97,514,000 on 22 projects in 17 Western States and would preclude the undertaking of any new projects during this period

A TENTATIVE 10-year construction program for Federal reclamation with total estimated expenditures amounting to $97,514,000 that will result in the completion of all existing Government projects was proposed recently by the Interior Department.

The program contemplates construction work on 22 unfinished projects in 17 Western States with annual expenditures averaging between $8,446,000 and $10,826,000, a sum exceeding the probable average annual income of the reclamation fund by about $1,000,000. If adopted, the program will preclude the undertaking of any new projects by the Government during this period.

Annual construction work to carry out the proposed program provides for the expenditure of $10,826,000 in 1928, $10,239,000 in 1929, $9,118,000 in 1930, $9,180,000 in 1931, $8,597,000 in 1932, $8,450,000 in 1933, $8,521,000 in 1934, $8,730,000 in 1935, $8,584,000 in 1936, $4,486,000 in 1937, with an additional $6,823,000 to be expended thereafter. An outline of the apportionment by projects of these annual expenditures under the program follows:

ESTIMATED PROJECT EXPENDITURES

Yuma, Arizona-California.—A total of $1,291,000 to complete the distribution, drainage, and power systems of this project. Of this amount it is proposed to expend $35,000 in 1928, $60,000 in 1929, $55,000 in 1930, $550,000 in 1931, and $591,000 in 1932. This project under the program will be completed in 1932.

Orland, California.—A total of $727,000 to construct the Stony Gorge Reservoir and complete lateral canal extensions and linings, the proposed expenditures consisting of $605,000 in 1928, $32,000 in 1929, $30,000 in 1930, $30,000 in 1931, and $30,000 in 1932. This project under the program will be completed in 1932.

Grand Valley, Colorado.—A total of $136,000 to complete distribution and drainage systems of the project divided as follows: $30,000 in 1928, $30,000 in 1929, $30,000 in 1930, $30,000 in 1931, and $16,000 in 1932. This project under the program will be completed in 1932.

Uncompahgre, Colorado.—A total of $500,000 for drainage system, $300,000 to be expended in 1932 and $200,000 in 1933. Under the program this project will be completed in 1933.

Boise, Idaho.—A total of $6,334,000 for main canal betterments, and drainage on the Arrowrock and Payette divisions distributed as follows: $116,000 in 1928, $84,000 in 1929, $50,000 in 1930, $1,000,000 in 1932, $1,500,000 in 1933, $1,500,000 in 1934, $1,500,000 in 1935, and $584,000 in 1936. This project under the program will be completed in 1936.

General view of Guernsey Dam, North Platte project, Nebraska-Wyoming, from upstream side

Minidoka, Idaho.—A total of $8,423,000 to complete American Falls Reservoir, American Falls power development, Minidoka power development, South side pumping division drainage and North side pumping unit. This proposed expenditure is divided as follows: $1,583,000 in 1928, $1,000,000 in 1930, $2,671,000 in 1931, $1,000,000 in 1932, $1,250,000 in 1933, and $919,000 in 1934. This project under the program will be completed in 1934.

Milk River, Montana.—A total of $181,000 to complete the St. Mary Canal and Sherburne Lakes reservoirs and canal and lateral system with $17,000 expended in 1928, $40,000 in 1929, $40,000 in 1930, $49,000 in 1931, and $35,000 in 1932. Under the program this project will be completed in 1932.

Sun River, Montana.—A total of $3,653,000 for Gibson Reservoir, Fort Shaw distribution system, Northside distribution system and Northside drainage with $1,037,000 expended in 1928, $1,165,000 in 1929, $500,000 in 1935, $500,000 in 1936 and $451,000 in 1937. This project under the program will be completed in 1937.

Lower Yellowstone, Montana-North Dakota.—A total of $460,000 to complete drainage system divided as follows: $100,000 in 1928, $180,000 in 1929, $180,000 in 1930. This project under the program will be completed in 1930.

North Platte, Nebraska-Wyoming.—A total of $707,000 to complete Guernsey Reservoir, power development, distribution and drainage systems on the Interstate and Fort Laramie divisions, the expenditures to be divided as follows: $450,000 in 1928, $147,000 in 1929, $75,000 in 1930, and $35,000 in 1931. Under the program this project will be completed in 1931.

Newlands, Nevada.—A total of $1,164,000 for Truckee storage, canal construction, a power system, and Carson division distributing system which of $64,000 is to be expended in 1928, $50,000 in 1929, $50,000 in 1930, $500,000 in 1934 and $500,00 in 1935. This project under the program will be completed in 1935.

Carlsbad, New Mexico.—A total of $1,001,000 for McMillan Reservoir claims and for Avalon water storage divided as follows: $501,000 in 1929 and $500,000 in 1930, thus completing this project in that year.

Rio Grande, New Mexico-Texas.—A total of $590,000 to complete distribution and drainage system of the project divided as follows: $400,000 in 1928 and $190,000 in 1929. This project under the program will be completed in 1929.

Owyhee, Oregon.—A total of $17,714,000 to construct storage, canal, and drainage systems, to be expended as follows: $2,000,000 in 1928, $3,000,000 in 1929, $3,000,000 in 1930, $3,000,000 in 1931, $3,000,000 in 1932, $3,000,000 in 1933, and $714,000 in 1934, thus completing the project in 1934.

Vale, Oregon.—A total of $3,115,000 for storage, canal, drainage, and distribution system, divided as follows: $750,000 in 1928, $750,000 in 1929, $750,000 in 1930, and $865,000 in 1931. This project under the program will be completed in 1931.

Klamath, Oregon-California.—A total of $1,831,000 to complete Tule Lake distributing and drainage systems, Langell Valley (Clear Lake) and Langell Valley (Gerber division). Expenditure of this sum is divided as follows: $124,000 in 1928, $500,000 in 1932, $500,000 in 1933, $477,000 in 1934, and $230,000 in 1935. This project under the program will be completed in 1935.

Belle Fourche, South Dakota.—A total of $1,000,000, divided as follows: $125,000 in 1928, $250,000 in 1929, $250,000 in 1930, $250,000 in 1931, and $125,000 in 1932. Under the program this project will be completed in 1932.

Salt Lake Basin, Utah.—A total of $12,400,000 to complete Echo Reservoir and Weber Provo Canal and other divisions, distributed as follows: $1,240,000 in 1928, $1,000,000 in 1929, $760,000 in 1930, $1,400,000 in 1934, $2,000,000 in 1935, $2,000,000 in 1936, and $3,000,000 in 1937. At the end of the 10-year program this project will not be completed, and it will be necessary to expend an additional $1,000,000 thereafter to complete it.

Okanogan, Washington.—A total of $320,000 to line laterals and complete pumping plant, the entire amount to be expended in 1929.

Yakima, Washington.—A total of $25,579,000 for storage at Clealum Reservoir and complete construction of Roza, Kennewick, and Kittitas divisions. The expenditures on this project include $2,000,000 in 1928, $1,500,000 in 1929, $1,500,000 in 1930, $1,700,000 in 1931, $2,000,000 in 1932, $2,000,000 in 1933, $3,011,000 in 1934, $2,500,000 in 1935, $2,500,000 in 1936, and $2,500,000 in 1937. At the end of 1937 this project will not be entirely finished, and an expenditure of $4,368,000 will be required thereafter.

Riverton, Wyoming.—A total of $5,195,000 to complete project, divided as follows: $600,000 in 1929, $600,000 in 1930, $500,000 in 1935, $2,000,000 in 1936, and $1,495,000 in 1937. Under the program this project will be completed in 1937.

Shoshone, Wyoming.—A total of $5,193,000 for drainage on Garland division and distribution and drainage on Willwood division and completion of Heart Mountain division, divided as follows: $150,000 in 1928, $340,000 in 1929, $248,000 in 1930, $1,000,000 in 1935, $1,000,000 in 1936, $1,000,000 in 1937. Under the program this project will not be completed at the end of 10 years, and expenditures thereafter amounting to $1,455,000 will be necessary.

Special Advisers Visit Southern States

THE special advisers on reclamation and rural development, appointed by Secretary Work to make a study of certain problems of reclamation and rural development in the Southern States, left Washington on December 2 and returned about the middle of the month.

The special advisers comprised Howard Elliott, chairman of the board of directors of the Northern Pacific Railway; George Soule, economist and a director of the National Bureau for Economic Research; and Daniel C. Roper, former Commissioner of Internal Revnue, and long connected with agricultural development in South Carolina. Accompanying Mr. Elliott were J. M. Hughes, land commissioner of the Northern Pacific Railway, and Dr. C. M. Duncan, economist of the Association of Railway Executives.

The Department of the Interior was represented by Dr. Elwood Mead, commissioner of the Bureau of Reclamation; Copley Amory, expert reclamation economist; Hugh MacRae, of Wilmington, N. C., special adviser; and H. A. Brown, chief of the division of settlement and economic operations of the bureau.

The party visited in order properties near Pembroke, N. C.; Charleston, S. C.; Albany, Ga.; Selma, Ala.; Hattiesburg, Miss.; and Mayland, Tenn. All of these properties had been selected by the State officials for this particular study.

During the course of the trip the party was joined by agricultural representatives of the Seaboard Air Line, Atlantic Coast Line, Central of Georgia Railway, Western of Alabama Railway, Southern Railway, and Tennessee Central Railway.

Local committees at each of the points visited cooperated to the fullest extent in furnishing automobiles for a rapid and thorough inspection of the properties.

In a letter to each of the three special advisers, Secretary Work wrote as follows:

In all of these States there are large areas of fertile but neglected, uncultivated land. There are swamps to be drained, areas given over to weeds, and brush to be cleared, settled, and made productive. We have learned, however, that works for reclamation will not alone result in settlement and the creation of prosperous agricultural communities. The character of the homes which can be established, the rewards for toil and thrift which settlers secure depend on adequate credit facilities, the kind of crops grown, the skill of cultivators, and on the cooperative and other organizations created for marketing crops and securing the proper social and educational advantages.

I am hopeful that a brief but intensive study of the typical areas selected by each State will show that great national benefits will result from the creation of rural communities having a definite agricultural program and organized to cooperate in social and business affairs. The decline in agriculture, shown in the statistics of these States, is not local. The exodus from the land is nation-wide. To correct it, farming communities must be organized, as the industries of cities are organized. These unoccupied lands of the South would seem to be a fine opportunity for making a demonstration of what can be done by careful planning to enable families of industry and thrift to become home owners and lead thereon a pleasant and profitable life.

The information already gathered shows conclusively the benefits which would come to these States if a successful scheme of planned community development could be put in operation. In response to an inquiry from the Bureau of Reclamation some 80 tracts of land, varying in size from a few thousand to 250,000 acres, were submitted as available for such development.

The State authorities have kindly made a study of the tracts submitted and have selected one in each State as fairly typical of the needs and opportunities for reclamation and planned rural development. The States and the Bureau of Reclamation have been gathering statistics regarding prices of land, costs of reclamation and farm development, taxes, crops which can be grown, and other facts which will help the advisers to reach conclusions as to the merits of reclamation in this section. The Bureau of Reclamation will place all its information and facilities at their service.

It is my desire that the advisers, after visiting these areas and considering the information which has been collected, should make a report advising me as to whether this investigation should be continued, and, if so, what it should include. I shall then transmit this report to the President. If conditions are regarded as justifying continuing this investigation, this report might outline what the advisers consider to be the respective spheres of Federal, State, and private activity.

The three special advisers have been selected from outside of the Government service in order that their conclusions shall represent a detached, impartial, and wholly national viewpoint as to what shall be done and the methods which should be employed.

Land Settlement on the Federal Reclamation Projects

"We should look to the future—25, 50, or more years distant—rather than now, as the bringing in of new land is a slow process at best"

By R. F. Walter, Chief Engineer, Bureau of Reclamation

THE original reclamation act was enacted by Congress in 1902, under which irrigation projects were constructed in all of the Western States except Oklahoma. This act provided for repayment of the cost of construction in 10 annual installments without interest. No provision was made for settlement or farm development. It was expected the irrigated lands under these projects would be speedily settled with farmers who were land hungry and that prosperous and contented homes would result. Except on a very few projects these expectations were not realized, and the cause was laid to inability to meet the 10 per cent construction repayments falling due from year to year. To remedy this what was known as the extension act was passed in 1914, extending repayments to 20 annual graduated installments without interest. No provision was made in this act for settlement or farm development, and after a few years' trial, during which the construction payments required were but 2 per cent of the cost per year, the conditions were found to be little, if any, better than before the passage of the extension act, and as a whole the results continued disappointing. Something was radically wrong.

THE FACT-FINDING COMMISSION

During 1923 Dr. Hubert Work, having assumed the high office of Secretary of the Interior, realizing that something must be done, created a fact-finding commission made up of men familiar with western conditions and recognized authorities in their respective fields of endeavor to study the situation and try to find out what was wrong. These men were Thomas E. Campbell, former governor of Arizona, chairman; James R. Garfield, of Ohio, former Secretary of the Interior; Dr. Elwood Mead, of California, the present Commissioner of the Bureau of Reclamation, who had made a life study of irrigation in all the Western States and had spent many years in similar work in Australia; Oscar E. Bradfield, of Ohio, president of the American Farm Bureau Federation; Dr. John A. Widtsoe, of Utah, ex-president of the State University, a student and author of many articles on farming and irrigation; and Clyde C. Dawson, of Colorado, an authority on irrigation law and practice.

This commission accumulated a great mass of data and facts, held hearings with the settlers, and gave months of time to the study of these conditions. Their labors resulted in a voluminous and valuable report dated April 10, 1924.

Without taking the time to detail the various conclusions reached by this commission in connection with the past financial conditions on the several projects and its valuable constructive recommendations for adjustments of the difficulties of this nature, I quote herewith from those relating more particularly to the question at issue:

First Peas Shipped From Yuma Project

A full carload of green peas, the first ever shipped from the Yuma Valley, was billed recently to eastern points. The car was made up from peas picked from six fields in the valley, operated by A. T. Finch, Fred Bloom, Charles Flint, J. W. Reed, and W. J. Dixon.

About 150 acres of peas were grown this year on the project, and if the returns are as good as anticipated, this shipment should mark the beginning of a paying industry on the Yuma project.

DISPOSITION OF PRIVATE LANDS IN EXCESS OF FARM UNIT

That no reclamation project should hereafter be authorized until all privately owned land in excess of a single homestead unit for each owner shall have been acquired by the United States or by contract placed under control of the Bureau of Reclamation for subdivision and sale to settlers at a price approved by the Secretary. This price to be considered in determining what land and water will cost settlers and hence the feasibility of the project under the payment conditions of the law.

COST OF LEVELING LAND CHARGED TO CONSTRUCTION

Hereafter the expense of leveling project lands and building suitable distribution systems for efficient and economical irrigation should be made a part of the construction costs.

SURVEY AND CLASSIFICATION OF PROJECT LANDS

The Secretary of the Interior should undertake at once a comprehensive and detailed survey of the physical and economic features of the Federal reclamation projects, to secure information upon which the project lands may be classified with respect to their power, under a proper agricultural program, of supporting the farmer and his family and of repaying the construction costs of the project. This survey should be in sufficient detail to enable the grouping of the farm units, under each project, into divisions or zones, each of approximately equal productive power. All lands which at the time of the survey do not possess a productive power sufficient to support the farmer's family and to repay construction costs should be grouped in one class, and all lands which are just coming into agricultural production and not yet ready to begin repayments should be grouped in another class, both of these classes of land to be exempt from requirements of repayment of the construction costs.

Such surveys of the project lands should be made periodically as the progress of knowledge may suggest, and for the purpose of determining any changes that may have accompanied the continued cultivation and irrigation of the lands.

SETTLERS SELECTED ACCORDING TO ABILITY

Owing to the increased cost of water rights and greater expense of developing farms it is no longer possible for average settlers without capital to succeed in improving and paying for farms on these projects. Loans for development should be made a part of the reclamation policy.

This can not wisely be attempted unless consideration is given to the qualifications of settlers, which would include industry, experience, character, and possession of a part of the capital needed in improving their farms. Only those who have reasonable prospects of succeeding should be approved.

REPAYMENT PLAN BASED ON ACRE INCOME

Experience has demonstrated that the present method for repayment of project construction costs, based upon time and percentages of cost, instead of the ability of the several classes of lands to produce, is unscientific and difficult of fulfillment. Productive power should be the basis for the annual repayments of construction costs, and for this purpose productive power of the lands should be defined to be the average gross annual acre income from the irrigated lands of a project or division thereof for the preceding 10 years, or for all years of record, if fewer than 10 years are available, and that the annual acre repayment charge should be 5 per cent of the productive power of the lands as hereinabove defined.

AGRICULTURAL ADVISERS PROVIDED

The conditions which confront settlers on reclamation projects require them to use better tools and to adopt a better agricultural program in order to meet payments on land, improvements, and water rights. This requires the employment on the projects of trained agricultural and economic advisers who will give sound agricultural and business advice to

enable settlers to increase their farm incomes and to organize for cooperation in business and social affairs.

A brief experience has been had on some of the projects in the employment of such advisers. It showed their value, but the plan was abandoned because such employment was held to be unauthorized by the reclamation act.

The law should be so amended as to give unquestioned authority for the employment of such advisers.

A CREDIT FUND FOR FARM EQUIPMENT

Project settlers are in need of relief from paying high interest rates on short-time loans. They are often unable to borrow money with which to improve and equip their farms. A credit fund should be provided under competent control, from which settlers on the projects can borrow money with which to make permanent improvements or to buy needed equipment and livestock. Loans for permanent improvements, secured by the land, should run not to exceed 30 years; loans for equipment and livestock not to exceed five years. The rate of interest should be 5 per cent; payments of principal should be amortized; the making or refusing of loans should be at the discretion of the credit authorities.

On April 21, 1924, President Coolidge transmitted this report to Congress, urging the necessity of immediate revision of the reclamation law in effect at that time, and as a result the act of December 5, 1924, known as the fact-finders' act, was passed. While this act authorizes a comprehensive and detail survey to ascertain all pertinent facts, for report to Congress on proposed adjustments on many of the old projects and under certain conditions for repayment of future installments of construction charges at the rate of 5 per cent of the average gross annual crop production, it failed to provide for agricultural development and land settlement. Subsequent legislation attempted to make this a duty of the State on new projects authorized for construction.

THE BOARD OF SURVEY AND ADJUSTMENTS

To secure the information desired by Congress on old projects, a board of survey and adjustments was organized, consisting of Chairman Campbell and Doctor Widtsoe, of the original Fact-Finding Commission together with local representatives appointed by the governors of the various States in which projects under consideration were located. Following a careful study in the field with a competent staff of experts on soils and crop production this board made report on December 19, 1925, which resulted in the act of May 25, 1926, known as the adjustment act. This act provided for the reduction of project construction charges amounting to some $27,000,000, funding of unpaid accruals, and substituted a repayment plan for new and old projects based on not to exceed 40 annual installments without interest for the 5 per cent average annual crop-production plan. Again, no provision was made for agricultural development or systematic settlement of the project lands. Special legislation introduced by Senator Kendrick and Representative Winter, of Wyoming, to accomplish a start in this direction by inauguration of a limited program on two projects in which vacant Government land largely predominates also failed to receive the sanction of Congress.

Ship First Lettuce From Yuma Project

Recently the first car of lettuce to be shipped from the Yuma Valley went out from Somerton, billed to eastern points. This lettuce, all top-notch in quality, was from the 100-acre plot on the ranch of J. W. Gray, near Somerton. It was expected that this lettuce would bring on the eastern market from $4.50 to $5 a crate. If the 320 crates went at this price, it would indicate a handsome profit for Mr. Gray.

It is stated that with the right sort of care lettuce should average 200 crates to the acre on the Yuma project, which, with an average profit of $1 per crate throughout the season, should make cotton farmers forsake their pet crop and turn their attention to feeding rather than clothing the public.

This is the situation as it stands to-day, and while the Bureau of Reclamation has provided for this important, and, I believe, fundamental, requirement for successful irrigation projects, by the organization of a section of reclamation economics under the commissioner, it is handicapped by lack of definite authority, the success of this work being limited to the aid that can be secured from State and local agencies, including the railroad companies which are doing a great deal to colonize the lands under their systems. However, if the results are good there is reason to believe that Congress will go the limit to put reclamation on a sound basis.

NO DANGER FROM SURPLUS

Some will no doubt question the need for aided and directed settlement on irrigation projects in the West on the theory that this will increase overproduction to come in competition with an already large surplus and that such work is unnecessary for the reason that the early pioneers made a success of irrigation by their individual efforts.

As to these objections, both of which I have heard advanced by many men who have studied this question, especially in the East, the Secretary of the Interior, Doctor Work, in a release as late as the 19th of this month, says:

Our last frontier has disappeared. The country must live within itself, and it is the part of good husbandry to protect our capital investment and restore by artificial means that which has been lost because of the demands of immediate necessity.

He said he was not disturbed by charges from agricultural States that we are at present overproducing in agriculture beyond the demands for our products, with correspondingly lowered unprofitable prices to the producer in this connection.

He said "we have been developing Federal reclamation in the West for 25 years and what we have produced is negligible when conpared with the production of the whole country The 1,242,750 acres farmed on Government irrigation projects, last year produced crop values of $96,100,000. When these totals are compared with 372,000,000 acres farmed in the entire United States worth $13,031,000,000, we may safely ignore the immediate danger from reclamation." He said "we should look to the future—25, 50, or more years distant—rather than now, as the bringing in of new land is a slow process at best," and further, "it is a well-recognized fact that the direction of the first step is more important than the length of it."

President Coolidge in letter of September 17, 1924, read at the annual convention of the American Mining Congress at Sacramento, September 29, 1924, in referring to our reclamation development, voices what I think should be the policy of a progressive West as follows:

Some minor criticism has been made as to the policy of our unremitting development of these projects by those who have thought we were already overproducing in agricultural products. They feel that these projects should be stayed until agricultural production has readjusted itself. These criticisms lie in the lack of understanding that these projects take many years for development, that they furnish but a small portion of the total increased food supply required even by our increase in population, that the utilization of their supplies lies in the development of the West itself. It is my purpose to unremittingly stimulate and encourage the development of these great projects by every authority of the Federal Government.

PRESENT USE OF IRRIGABLE AREA

In order that the present settlement situation and need for experienced settlers with financial ability to own and develop farms on Federal irrigation projects in

the West may be better understood, I have compiled from the results of statistics taken in 1925 a table showing the present use of the irrigable areas on Federal reclamation projects. The various areas given are, as far as possible, based on the results of the land classification made by the board of survey and adjustment in 1925 and thus represent productive areas after elimination of all nonproductive lands.

It is intended to show in this table, by States and projects, the locations and areas of lands which have been classified in the productive classes which were farmed and which were not farmed in 1925. It also shows the per cent farmed by tenants during 1925 and areas which, on account of inferior soils, lack of adequate water supply, need of drainage construction, or other causes, have been suspended from construction repayments pending further development and proof of the possibility of successful cultivation.

The analysis of these areas shows that 411,767 acres, or 22 per cent of the productive area available on completed projects, was idle during 1925, running from practically none on the Carlsbad project in New Mexico to over 60 per cent on the Milk River, Sun River, and Lower Yellowstone projects in Montana. Of the areas irrigated during 1925, some 11,992, or 32 per cent out of a total of 37,737 farms, were farmed by tenants. This is largely due to the lack of settlers or farmers with the necessary capital to purchase and develop these farms, and results in a farm owner leasing, and farming, generally in an indifferent manner, from one to several adjacent farms. For proper development an owner should be in possession and farm each of these now farmed by tenants.

In addition to the project lands, water or supplemental water, was furnished to 1,237,885 acres, of which 307,215 acres, or 25 per cent, were reported as idle during the year.

New projects have been authorized by Congress that will irrigate 307,000 additional acres, practically none of which is now farmed, and will from time to time, as irrigation works are completed, require farmers financially able to develop them.

Assuming that irrigated farms comprise irrigable areas of 60 acres, which is about the average, settlers are, or will be, needed for these farms as follows:

	Acres	Farms
Present projects (idle lands)	411, 767	6, 863
Present projects now farmed by tenants	671, 520	11, 192
New projects authorized	307, 000	5, 117
Warren Act contractors (idle lands)	307, 215	5, 120
Total	1, 697, 502	28, 292

The gross crop production on the 37,000 farms reported as irrigated on Federal projects in 1925 was $77,608,880, or an average of $62.45 per acre. Government storage works also supplied water to private projects under the Warren Act, which produced crops estimated to be worth $53,665,850, or a total addition to our national income of more than $131,000,000. More than 480,000 people lived on the 37,000 farms under these projects. The Government's expenditure in these irrigation works is about $200,000,000. It is estimated that $97,000,000 will be required to complete the present projects and those now authorized, the expenditure of which should duplicate these results.

DEVELOPMENT COSTS

To properly prepare and develop wild sagebrush land under an irrigation project requires experience and working capital ranging from $20 to $30 an acre on the most favorable topography and soils on Montana projects to $1,200 an acre for citrus fruit culture, where lands must be extensively fertilized and three or four years are required to bring trees to bearing, on the Yuma Mesa project in Arizona.

In addition to the preparation of the land and building of the farm ditches, a house for the family must be provided as well as fences, barns, and farming

Distribution of irrigable areas on Federal reclamation projects

State and project	Irrigable	Suspended	Productive	Irrigated, 1925	Idle, 1925	Per cent idle, 1925	Per cent farmed by tenants, 1925
	Acres	*Acres*	*Acres*	*Acres*	*Acres*		
Arizona, Salt River	336,000	0	336,000	333,000	3,000	1.3	14.6
Arizona-California:							
Yuma	65,000	0	65,000	60,172	4,828	7.4	49.2
Yuma Mesa	7,337	0	7,337	800	6,537	89.0	----------
California, Orland	20,659	0	20,659	13,955	6,704	32.4	16.5
Colorado:							
Grand Valley	30,380	7,150	23,230	13,488	9,742	42.1	34.7
Uncompahgre	103,413	27,629	75,784	61,637	14,147	18.7	43.0
Idaho:							
King Hill	12,414	2,414	10,000	8,836	1,164	11.6	3.0
Minidoka	119,608	3,276	116,332	110,000	6,332	5.4	44.2
Boise	152,134	6,436	145,698	113,630	32,068	22.0	38.5
Montana:							
Huntley	33,447	13,476	19,971	18,939	1,032	5.2	61.4
Milk River	87,930	32,930	55,000	20,000	35,000	64.0	46.2
Sun River	58,258	3,810	54,448	20,468	33,980	63.0	39.7
North Dakota-Montana, Yellowstone	58,561	10,801	47,760	18,276	29,484	61.7	39.8
Nebraska-Wyoming, North Platte	234,958	36,134	198,824	161,800	37,024	18.6	60.9
Nevada, Newlands	77,716	4,414	73,302	42,545	30,757	42.0	12.1
New Mexico, Carlsbad	25,000	0	25,000	24,778	222	0	59.0
New Mexico-Texas, Rio Grande	155,000	0	155,000	131,917	23,083	14.9	25.0
Oregon:							
Umatilla	22,881	4,627	18,254	13,345	4,909	26.9	31.3
McKay	25,000	0	25,000	[1] 10,000	[1] 15,000	60.0	----------
Klamath	69,330	4,017	65,313	34,403	30,910	47.3	21.7
South Dakota, Belle Fourche	75,000	10,500	64,500	48,800	15,700	24.3	56.8
Utah, Strawberry Valley	53,890	0	53,890	46,570	7,320	13.6	16.1
Washington:							
Okanogan	6,058	0	6,058	4,976	1,082	17.9	10.8
Yakima-Sunnyside	107,600	1,849	105,751	95,000	10,751	10.0	32.6
Tieton	32,000	3,032	28,968	27,650	1,318	4.5	34.6
Wyoming:							
Riverton	20,000	0	20,000	260	19,740	98.7	----------
Shoshone	61,659	7,062	54,597	36,664	17,933	32.8	28.8
Willwood	15,000	3,000	12,000	0	12,000	100.0	----------
Subtotal for projects	2,066,233	182,557	1,883,676	1,471,909	411,767	22.0	32.0
Warren Act contracts	----------	----------	1,237,885	930,670	307,215	25.0	----------
New projects authorized	----------	----------	307,000	----------	307,000	----------	----------
Total	----------	----------	3,428,561	2,402,579	1,025,982	----------	----------

[1] Estimated.

equipment. It is believed that even an experienced farmer should have available for use in development of the most favorably located 80-acre farm a minimum of $2,000 and this should be increased up to $5,000 or more for the unexperienced and for lands of more difficult topography and soils. Even with this amount of ready capital the farmer and his family will have to work hard before the farm is on a self-sustaining basis. He will also require additional short-time credit for which he can not afford to pay 8 or 10 per cent interest. If he purchases private land, the purchase price must also be financed on long-time payments and amortized at a low rate of interest.

SELECTION OF SETTLERS

Investigation and selection of applicants for the vacant Government lands was first authorized by the act of December 5, 1924, which provides as follows:

> That the Secretary is hereby authorized, under regulations to be promulgated by him, to require of each applicant, including preference-right ex-service men for entry to public lands on a project, such qualifications as to industry, experience, character, and capital as in his opinion are necessary to give reasonable assurance of success by the prospective settler. The Secretary is authorized to appoint boards, in part composed of private citizens, to assist in determining such qualifications.

This requirement was first put into effect this year in connection with the opening of lands under the Riverton project in Wyoming. The Secretary of the Interior has appointed an examining board, consisting of two members who are local citizens, in addition to the project superintendent, who is to act as secretary. Each applicant, before his homestead application is accepted, must appear in person before the examining board and show to the satisfaction of the board that he possesses the necessary farming experience, has good character, and reputation for industry, and possesses capital of not less than $2,000 in cash or equivalent. Applicants of limited experience may be required to show additional capital up to $5,000.

This will, of course, restrict settlement of these lands, but an incompetent farmer with no capital or credit is a liability and not an asset to any community.

While Congress has thus made possible a great step forward by providing for selection of entrymen on Government lands, it must be remembered that the greater part of the land under Federal reclamation is in private ownership, often in large holdings, and there is still need for some plan that will insure control over the subdivision and settlement of unimproved privately owned lands under present and future reclamation works.

PREVENTION OF SPECULATION

In an endeavor to partially control undue speculation on private lands which come under new projects and which will be greatly increased in value by the investment of the Government in the irrigation works, Congress provided in appropriations for several new projects lately authorized, including the Owyhee-Vale in Oregon and Kittitas in Washington, for appraisal of the private lands, showing actual bona fide present value without reference to the proposed construction of irrigation works therefor, and required agreements with the present owners that until one-half the construction charges against said lands shall have been paid, no sale of any such lands shall be valid unless and until the purchase price involved in such sale is approved by the Secretary of the Interior, and that such agreement shall also provide that upon proof of fraudulent representation as to the true consideration involved in such sale, the Secretary of the Interior is authorized to cancel the water right attaching to any land involved in such fraudulent sale. In order to further prevent the inflation of land values to the detriment of the ultimate developer of the farm, contracts made also provide that if any lands after appraisal are sold at a price in excess of the value fixed in the appraisal plus the value of any water right payments made and improvements placed thereon, one-half of such excess is to be paid to the district and is to be applied by it upon the construction charges to the Government. These provisions will undoubtedly have a tendency to prevent runaway booms in land values such as crippled many of the older projects and, by foreclosures, landed a large part of the areas in the ownership of loan companies.

Doctor Mead, the present commissioner of the bureau, who has made a lifetime study of this question, in his pamphlet recently issued by the department, entitled "Federal Reclamation—What It Should Include," summarizes the principles that should be included in a successful land settlement program as follows:

1. Settlers must be selected. Developing farms under irrigation requires a certain amount of capital and certain definite qualities. Without these only disappointment can result.
2. They must be settled on the land, not in isolated units, but in groups or colonies of sufficient size to secure economic and social advantages.
3. There must be aid and direction in the preparation of the land for irrigation. In this, cooperation is important. Settlers working as a community can do many things better than as individuals working alone.
4. Many settlers who love farming and who, if given a chance, will become good farmers have inadequate capital. They should be helped to get a start by means of credit banks or other special arrangements.
5. Markets must be studied, crop rotations suggested, and a program of marketing worked out suited to the conditions which govern transportation from the producers to the markets.
6. The payments of the initial years must be made as easy as possible.
7. The aim should be ownership of small farms rather than tenancy on larger estates.

CAPITAL REQUIREMENTS

Assuming that ready cash in the amount of $2,000 or the equivalent thereof is required on the most favorable lands to be developed by experienced farmers to $5,000 or the equivalent thereof by inexperienced farmers who settle on the less favorable lands, the average capital required for development of an 80-acre farm is $3,500. For the 28,000 farms available on completed and authorized projects and under Warren Act contracts, it is evident that $100,000,000 capital must be provided from some source for development before these farms become going concerns with sufficient equities to make safe loans possible through the Federal farm loan banks or other agencies and to safeguard the investment of the Federal Government in the irrigation works.

Increased interest has recently been shown in aid for settlement in the West and South and of the plans advanced one is for States to take charge of the settlement and development work after the irrigation and drainage works have been provided by the Federal Government, on the theory that they have a vital interest in the quality of settlers and in the development of wealth on the land. This theory encountered fatal objections in Congress.

Another plan for financing and directing this work was to use the reclamation fund. The opposition in Congress to this was also vigorous and support is, to say the most, only lukewarm.

The third plan is to require the locality where a new project is to be located to raise a fund to supplement the settlers' capital, this fund to be revolving, and after a farm has been sufficiently improved to produce an income, loans from the Federal land bank to be substituted. The Federal land bank will not lend money on unimproved and undeveloped land. It must be assured that there is a crop income sufficient to meet the payments as they come due. This plan might operate successfully on some projects, but in sections of the country where the people are all poor and without outside resources, no such fund could be raised. This would be where it was most needed.

We still have this problem with us.

Contract Between the United States and the Strawberry Valley Water Users' Association

Providing for the transfer to the association of the operation and maintenance of the Strawberry Valley Irrigation Project, Utah

Strawberry Dam and Reservoir, Strawberry Valley project, Utah

UNDER date of September 28, 1926, the United States entered into a contract with the Strawberry Water Users' Association, by which the care of the Strawberry Valley project, Utah, was intrusted to the association, and in which the association agreed to pay all charges incurred by the United States in connection with the project.

This project lies in the vicinity of Provo, Payson, and Spanish Fork, Utah. The project people are largely Mormons who have been practicing irrigation in the vicinity from a period antedating the Civil War. They are therefore thoroughly familiar with irrigation practice and institutions. Their land is generally divided into small holdings, intensively cultivated, and there seems to be no reason to doubt their ability to manage the project.

CONTRACT DIFFERENCES

This contract differs greatly from the contracts that have been reviewed in the issues of the NEW RECLAMATION ERA for the months of August, September, October, November, and December, 1926, the main difference being due to the fact that the present contract is with a private corporation not having the power to tax the lands of the water users, whereas in the case of the contracts previously reviewed the agreements were with irrigation districts which are quasi-municipal corporations, having the taxing power.

At the time the Strawberry Valley project was initiated by the United States, a large portion of what is now known as the Government project had a water right from the unregulated flow of local streams which, however, did not continue throughout the growing period, there being a deficient supply of irrigation water late in the season. To remedy this situation the Government constructed Strawberry Reservoir on the watershed of the Strawberry River, and by means of a tunnel brought the stored supply to the Spanish Fork River, so that it could be used on the Strawberry Valley project. This added supply of water also enabled the Government to develop a new division of the project, known as the High Line unit. The cost of the project was roughly $3,500,000.

On the High Line unit the water users had contracted to purchase 2 acre-feet of water per acre per annum. On the old units of the project the water users purchased as a usual matter less than 2 acre-feet of water per acre per annum, the reason being that the water users on the old units had a partial water right for their land antedating the Government project.

The association agrees to care for the transferred property in such a way that it shall remain in as good condition as of the date of transfer. The association is not to make any substantial change in the transferred works without obtaining the consent of the Secretary of the Interior.

OPERATION AND MAINTENANCE TO BE PAID IN ADVANCE

Beginning with the year 1927 the estimated operation and maintenance charges are to be payable in advance. Until payment to the United States for the project has been completed the association is to employ a superintendent of the project who is to be and remain satisfactory to the United States. In case this superintendent becomes unsatisfactory from the standpoint of the United States he is to be discharged upon request of the Secretary of the Interior. The association's power-house superintendent, in charge of the power plant constructed by the Government on the project, and the association's accountant are likewise to be removable at the request of the Secretary of the Interior.

At the time of the transfer of the project to the association the United States had from 6,000 to 8,000 acre-feet of water remaining in the reservoir unsold. The United States is to continue efforts to dispose of this water, but if the Government is unable to sell the water the association is to assume the obligation of making payment for same.

The association agrees to collect from the individual water users the amounts due from them under their contracts with the United States and to pay such amounts over to the United States. The association guarantees the payment of all such installments and is itself to make payment to the United States within 30 days after the due date of any amounts not collected from the respective individual water users. Amounts due the United States and uncollected at the date of the transfer are to be collected by the association and paid over to the United States. The association guarantees the collection of such accounts and is itself to make payment on or before March 1, 1927, of any amounts not theretofore collected and paid to the United States.

RESTATEMENT OF FINANCIAL RELATIONS

On July 1, 1930, there is to be a restatement of the financial relations between the association and the United States, and on December 1, 1930, there shall be paid by the association to the United States 5 per cent of any balance

remaining in the construction account not secured by repayment contracts, and a like percentage is to become due on each December 1 thereafter until the balance is fully paid.

On March 1, 1928, and on March 1 annually thereafter the association is to pay to the United States, in each case for the preceding calendar year ending on December 31, a flat charge of one-tenth of 1 per cent of the net investment of the United States as of January 1 preceding, which charge is to cover all overhead charges for the Denver office, field legal office, and any other detached offices. Costs incurred by the United States for inspection and repairs are to be paid at the same time.

The United States owns a large body of lands needed to protect the water shed of the Strawberry Reservoir. These lands are being rented for grazing purposes, and article 22 of the contract bearing on these lands is quoted in full, as the matter is of considerable importance:

Watershed Lands

22. Receipts from watershed lands from and after October 1, 1926 (or from and after such other time as the association takes over the care, operation, and maintenance of the transferred property), shall be collected by the association and the net receipts credited by the association under Subsection I of section 4 of said act of December 5, 1924 (unless otherwise directed by order of a competent court), in such manner that each acre-foot of water sold from the project water supply shall be credited with a pro rata part of such net receipts, except that each acre-foot of water hereafter sold shall share pro rata in said receipts from and after the date of sale only. The act of Congress of April 4, 1910 (36 Stat. 285), provides in part as follows:

Wind River diversion dam, Riverton project, Wyoming

"All right, title, and interest of the Indians in said lands are hereby extinguished, and the title, management, and control thereof shall pass to the owners of the lands irrigated from said project whenever the management and operation of the irrigation works shall so pass under the terms of the reclamation act."

It is understood that the title, management, and control of said purchased land is not to pass to the association under said act unless and until at least 51 per cent of the project construction cost is paid to the United States, the Secretary's decision as to said date to be final and binding upon both parties hereto.

The association, as permitted by statute, is to act as fiscal agent of the United States in the collection of amounts due the United States from the water users and others. The association has deposited a bond in the penal sum of $20,000 to secure its faithful performance of its duties as fiscal agent.

The association is to pay to the United States the full amounts provided for in the contract, without deductions on account of the failure of some of the water users to meet their indebtedness. In order to secure funds to meet this so-called "joint liability" the association is to levy assessments upon its shares of stock to raise a sum sufficient to equal the estimated deficiencies due to the failure of some of the individual Government debtors to meet their debts.

Approximately 55,000 bushels of grain in this pile at American Falls, Idaho

Irrigation Development In French Morocco

The largest and most pretentious irrigation work in French Morocco is the dam on the Oued Beth in the El Kansera gorges, which it is hoped to complete in 1929. The dam is 131 feet high, forming a lake of 162,000 acre-feet capacity. The water will be released at the rate of 353 cubic feet per second upon the plain between the Oued Beth and the Oued Redom, irrigating between 49,500 and 74,000 acres. The work has been started by the construction of a reinforced concrete irrigation canal.

AGRICULTURAL products shipped from the Minidoka project during November totaled 533 cars, 364 cars of which were potatoes.

Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

"Willow Wood Farm," home of Mrs. Olive Sanders, near Ellensburg, Washington

New Year's Resolutions

JANUARY 1 of every year brings with it the usual mental resolution to do things just a little better than we have been doing them during the year just completed.

I wonder if among the things we promised to do during the past year was included the progressive resolution to beautify the farm surroundings and particularly to plant shade trees just as the season opened up sufficiently to do this. Some have carried out their resolution according to reports from the projects.

Let us aspire high enough in our ideals and picture for ourselves a home with surroundings such as is shown in the photograph above. This is the home of Mrs. Olive Sanders, of Ellensburg, Wash., and illustrates what can be accomplished on irrigated land. The grounds surrounding her home have been well planned. See the effective planting of deciduous trees, which afford the necessary shade in the summer months and permit the sunshine to flood the home in the winter months.

This is one of the show places of that locality and is reproduced in this section merely for the purpose of keeping before you this all-important subject, and act as an incentive to do as Mrs. Sanders has done, in order that you might enjoy the comfort, satisfaction, and pride she enjoys in this beauty spot she calls "home."

Know What You Are Buying at January White Sales

White sales have long been associated with the beginning of the year. The thrifty housekeeper sees ahead the need for replenishments in household linens, underwear, and sometimes in summer dress materials, which can be made up at her leisure during the early spring. She counts on the January sales to take care of some of these needs, because she knows that prices will be tempting and that there will be a good choice of materials and qualities.

The term "household linens" includes practically all white or chiefly white washable materials used in household furnishing, whether made of linen or cotton. The housewife checks over for possible renewal such items as bedding, sheets, pillowcases, spreads, and mattress protectors, tablecloths, napkins, doilies, centerpieces, tray cloths, luncheon sets, bureau and table covers, bath and other towels, washcloths, and kitchen towels. Sometimes cretonnes, prints and other washable figured materials are placed on sale with white goods by the yard during the month of January.

Those who make their underwear at home watch for opportunities to buy nainsook, long cloth, batiste, English broadcloth, and other suitable fabrics on the "white" tables. Some of these are also attractive for dresses and blouses, as well as heavier white goods like linen, poplin, or galatea, for sport skirts and middies. Dress materials at white sales, however, are not all white. The white goods predominate, but colored ginghams, prints, percales, and other wash fabrics are often specially priced at this season, so it pays to be on the lookout for bargains. Both white and colored linens may usually be found among the offerings at these sales.

To help the woman who finds herself somewhat at a loss to choose among the great variety of cotton materials displayed, there is a Farmers' Bulletin No. 1449–F, Selection of Cotton Fabrics. To get it you merely write to the United States Department of Agriculture, at Washington, D. C. In it you will find a list of the best materials to use for each of the various household purposes, and in addition, a description of each of about a hundred fabrics, telling the kind of weave it has, and the common uses for it.

Why not take your daughter with you to some of the white sales, after you have read the bulletin? You can then teach her how to recognize the difference between a flimsy and a durable fabric, how to detect filled or sized materials, how to notice defects in the fiber or weave, and many other good points.

Suit Your Type

Variations of the V-shaped neck line will be found to be most becoming to the round face. The point may be slightly rounded or it may be made square. It is not always necessary for it to be pointed. A collar may or may not be used. The square neck is also becoming to this type of face although it is not as pleasing as the pointed neck. A round neck repeats the round line of the face making it appear more round.

Vegetables and fruits are rich in minerals and vitamins and these are food substances that children especially need for building strong, healthy bodies. Children need two servings of fruit and one or preferably two servings of vegetables every day in addition to potato, so the child specialists say. Though practically all kinds of fruit and vegetables are good for children, they recommend that oranges, grapefruit, tomatoes, and green-leaf vegetables be given most frequently.

The mineral constituents of milk that are especially important to the body are phosphorus, iron, and lime. Milk is much richer in lime, the chief constituent of bones and teeth, than are most other foods, and this is one of the reasons why it is an excellent food for children.

Meat Cakes for Children

One of the best meat dishes to have when there are young children in the family is broiled meat cakes. Everyone else will enjoy them too, so it is unnecessary to cook something else for the grownups.

For a family of five, you will need about a pound and a half of lean beef. Many persons prefer the round for meat cakes, but lean meat from the less expensive cuts, such as steaks from the fore quarter, is satisfactory. From whatever part of the carcass the meat comes, have it cut off fresh and ground twice. Various kinds of seasonings may, of course, be added but for children the meat itself with melted butter and salt added just before serving gives flavor enough. If you have an abundance of eggs, a yolk or two added to the meat gives a richer flavor and increases the food value. This is not at all necessary, however, and excellent meat cakes can be made by simply shaping the finely ground beef into rather flat cakes and broiling them quickly in a pan, rubbed with just enough suet to keep them from sticking, or broiled under a gas flame or over hot coals. In forming the cakes be sure not to pack the meat together too firmly, for this will make the cakes hard when they are cooked. Be sure also not to overcook the cakes. If they are rare inside when served they will have more flavor and juice.

For very small children, scraped beef is better than ground beef. This is generally prepared by scraping off the more tender part of a thick piece of round steak. This scraped meat may be then formed into cakes and broiled, or broiled on bread in the following way: Toast the bread on one side. Spread the meat with butter and broil quickly for a very few minutes directly under a gas flame.

Club member in the room she improved. Joy Gann, Albemarle County, Virginia

Girls Improve Their Own Rooms

In "Own Your Own Room" clubs girls learn how to plan a simple, attractive room, how to eliminate undesirable furnishings, how to select and arrange to best advantage what they already have, how to spend money wisely for new materials or furnishings, and how to care for their rooms. Very often it happens that when a girl has succeeded in making her own room attractive, the family becomes interested and soon the whole house is transformed.

The room shown in the illustration belongs to Joy Gann, a girl living on a farm in Albemarle County, Va. She started by filling up the holes in her walls and floor, with putty or plaster of Paris. Then she painted the walls and varnished the floor She undertook next to make over the dilapidated fireplace, replacing broken bricks at the back and making a new cement hearth with a very little assistance from her brother. She renovated the old-fashioned furniture of the room, and made cretonne curtains in brown and orange to harmonize with the sunset tint of her walls. She replaced a broken frame of glass, made three rag rugs, and a counterpane of unbleached muslin for her bed. This she embroidered in black and orange. Many other little touches completed a very comfortable and charming room which is the admiration of all Joy's young friends.

Illuminated arch over the State highway north of Orland, California

Pointing the Agricultural Way

Success of Owen H. Barrus, Utah Farmer

By Hon. William Spry, Commissioner, General Land Office

O. H. Barrus and his son Ralph inspect their beets and potatoes

THINKING it may be of interest to the readers of the NEW RECLAMATION ERA, I am calling attention to a very desirable section of country which will eventually come under the proposed Salt Lake Basin project. I have a very dear friend living at Grantsville, Tooele County, Utah, who for years past has been pointing the way for his farmer neighbors to follow and, incidentally, increase their crop production. He is Owen H. Barrus, 73 years of age, and of sturdy Utah pioneer stock. He first attracted my attention when, in answer to my criticism of the way the farms of that neighborhood were neglected, he offered me $1 for every weed I might find in either of his fields of wheat or sugar beets. I called at his place the same day, and, by the way, I left without collecting a single dollar.

My friend had sent to Minnesota for some Pioneer Dicklow wheat, and, after properly preparing the soil, he had sowed and irrigated it, until I found standing at the time of my visit the finest field of wheat I had ever seen. I learned afterwards he had threshed 80 bushels to the acre and his beets had produced 28½ tons to the acre. On further investigation, I understand he has been producing the Dicklow wheat for five years in succession with an average of 75½ bushels per acre. He was the pioneer in sugar-beet production in Tooele Valley and during the last eight years he has averaged 25 tons per acre. His farm is kept in model shape and, aside from his wheat and sugar-beet crops, he makes it a point to feed all he produces right on the place. In addition to his field crops, he has his own garden and orchard, lawn and flowers, raises his own poultry and attends to his own bees, cures his own meats, and he is not worried in the least as to what the Government is about to do for the farmer, for he has no mortgage or incumbrance whatever. All this he is doing at 73 years of age with only the help of three boys, the oldest of whom is 14 years of age. He also has time to devote to civic affairs, having served both his city and county in an official capacity, and he has done much for his church. He has always been ready to respond in Red Cross work and other national movements and during the late war was ever active in keeping his community up to a point of generous donation, himself giving to his country a fine manly son, who to-day sleeps with the poppies in France.

What Mr. Barrus is doing others may accomplish with the assistance of the Bureau of Reclamation. Through its beneficient policy, greater possibilities may be extended to the people of that valley and, with the combination of the water and the soil, coupled with the willingness of the people to do, I have a vision before me of that section of country flourishing as the proverbial green bay tree.

Belle Fourche Sugar Factory Seems Assured

The following letter, under date of December 4, has been sent by W. D. Buchholz, secretary of the Belle Fourche Irrigation District, to the directors of the district:

"J. S. Smith, of the Belle Fourche Bee, has received telegram, copy of which is as follows:

CHICAGO, ILL., *December 3, 1926.*

Conferences to-day amount to assurance of factory at Belle Fourche and immediate activity of sugar company in field activity and construction of factory. Must have approval of board of directors of railroad to build both spurs which goes to them with recommendation of President Sargeant on December 14.

R. L. BRONSON.
M. J. SMILEY.

"Yesterday we handled six Russian-German sugar-beet growers from the North Platte project and one who lived the past year near Nisland. Six out of the seven took farms in the Newell neighborhood, and they plan to raise beets from 25 to 50 acres per farm, thus indicating that about 200 acres of new beet ground have been secured for next year."

Dicklow wheat on the Barrus farm

Poultry Raising in Mesilla Valley

By Mrs. W. P, Thorpe, Dona Ana, New Mexico, Rio Grande Project

IN the Mesilla Valley, N. Mex., many people are raising poultry successfully and as a chief means of livelihood because the climate here is so nearly ideal for that occupation. The dry atmosphere and mild temperature eliminate the hazards experienced by poultry raisers in less favored sections. But since the care of the home flock devolves here, as elsewhere, upon the housewife, it is as such, and not as an experienced poultry raiser, that I might venture a few suggestions on how the backyard flock may be kept at a profit.

In the first place, I would say "Keep the birds and their quarters clean"—that is, not only free from visible dirt, but also free from vermin, for wherever chickens are kept you will always find a few parasites to fight. However, there are none that can not easily be kept under control by applying the proper remedy at the proper time. and once you know how to eradicate these pests the worst of your troubles are over. The parasites most commonly found here are the stick-tight flea, the body louse, and the fowl tick, which is commonly called the "blue bug."

GETTING RID OF PESTS

The stick-tight flea is very easily killed by the application of kerosene and lard (2 parts kerosene to 1 part lard) to the comb, wattles, and around the eyes of the fowl, and since this parasite breeds in dust and all dry trash, flood the premises occasionally.

Sodium fluoride will kill body lice, and may be used in the dry form by applying pinches of it with the finger tips to various parts of the body. It may also be used as a dip (one pound of sodium fluoride to 16 gallons of water). Dip your birds on a warm, sunny day, preferably about midday, to prevent them from taking cold. The blue bug is harder to exterminate than these other pests because it hides away in such deep cracks of the chicken house, lives such a long time without food, and can not be killed on the bird. Carbolineum has been used very effectively in fighting this pest. It is a heavy oil which should be thinned with kerosene and applied by means of a spray to the roosts and nests and forced well into the cracks and all possible hiding places. The first cost of carbolineum is greater than that of other oils which might be used, but the effects are more lasting.

Pure-bred white Leghorns on an irrigated farm on the Rio Grande project, New Mexico-Texas

POULTRY BULLETINS AVAILABLE

You can always get bulletins from the State College on any phase of poultry raising that you desire—from the incubation and brooding of chicks to the feeding of the birds from the baby chick stage to the laying hen; and living as we do, only a few miles from our State Agricultural College, we have access to all the first hand information we need from experts who are always ready and willing to give our problems their personal attention.

Green feed is easily obtained the year round. A field of alfalfa will furnish this practically all winter, and a patch of winter wheat is excellent. Some depend upon table scraps to partly feed a small flock. The outer leaves of lettuce and vegetable trimmings of nearly all kinds help to provide the required food elements and to keep the chickens in good condition.

CHOLERA TREATMENT

Diseases of poultry are very scarce here, but since we have in past years had some trouble with cholera I would like to give you a simple remedy that has not only cured every bird we have treated, but has finally stamped the disease out entirely. One teaspoonful of hydrochloric acid to a gallon of water is to be placed before the sick fowls for three days. Give no other drink but sour milk and cut off all grain until the birds recover. If the fowls have not recovered six days after the beginning of the treatment, it should be repeated at three-day intervals until the disease has disappeared. We have never found it necessary, however, to repeat the treatment. Sour milk fed to the flock every day is a good preventative for this ailment.

The housing of chickens is a simple problem here in this mild climate. Of course, if they are to be housed at all, they must be protected from drafts to prevent roup or colds.

Frame chicken houses are inexpensive, but make your fight on parasites a little harder, giving them better opportunities for hiding. Poured concrete is good, but costs more. Plastered adobe is very good, is easily kept clean by frequent whitewashing, and is quite inexpensive.

PICK YOUR BREED

I would not attempt to advise anyone as to what breed of chickens to keep, for all seem to do well here, and there is a great variety of kinds in the valley. Each has his own preference in that matter. Many prefer the Leghorns, and they can not be excelled for egg produc-

(Continued on page 14.)

Yakima Project Offers Splendid Opportunities to Right People

How two men made good

THROUGH the courtesy of Miss Louise F. Shields, a feature writer of the State of Washington, and Mr. E. F. Benson, agricultural development agent of the Northern Pacific Railway, the ERA is given the opportunity to print the following stories of how two men made good on the Yakima irrigation project, Washington:

THE SUCCESS OF A SCHOOL-TEACHER WITH CHERRIES

Prof. E. Bowles, of Prosser, Wash., came to the Yakima Valley from Kansas in 1901; was principal of the Prosser schools for three years, 1901 to 1905, and from 1906 to 1910 was superintendent of schools of Mount Vernon, Wash.

He bought 10 acres 2 miles west of Prosser in 1903 for $110 an acre, with paid-up water right. It had been plowed, leveled, and irrigated. In 1905 he set the entire place to Bing cherries, 60 per acre, about 24 by 23 feet apart.

The land was spotted, nearly half of it being very poor, and the immediate locality was frosty and lacking in air drainage. Portions of it became water-logged, and the trees on these spots died.

The orchard began bearing profitably in seven years (1912) and by using orchard heaters he has been able to secure profitable crops at least three-fourths of the time. Last year he sold 41 tons of cherries from the 6 acres now remaining in trees, the gross receipts being $9,000, prices ranging from 13½ cents a pound down to 7 cents. In 1919 he sold 50 tons for $11,482 from 7 acres that contained bearing trees at that time. This year, the yield from the 6 acres of cherries was 32 tons. He has raised a total of 330 tons in the 15 years since the orchard came into bearing.

His family consists of wife and daughter, hence the work with cherries is all hired, except his own labor. He figures that he gets about one-half of the gross returns from the place for his own labor, management, and capital invested. He has lived on the place 16 years and finds the work, generally speaking, agreeable and profitable.

When Professor Bowles gave up a profitable and successful career as a school man to settle down on a little 10-acre cherry orchard, many of his friends marveled and regretted his decision for his sake, but it is safe to say that Mr. Bowles never had occasion to regret his experience with the little cherry orchard near Prosser.

His place has for many years been a sort of mecca for prospective cherry growers from every district in the Northwest who have sought to profit by his experiences.

ITALIAN COAL MINER'S SUCCESS ON SMALL FARM

This is the story of Joe Bianchi:

I was born in Italy, coming to the United States at 22 years of age. Was a miner until the summer of 1919. Left the coal mines at Cle Elum, Wash., with $2,500 cash, all the money I had saved in this country in 20 years.

I bought 19 acres 3½ miles west of Prosser for $7,000. Paid down on the land every dollar I had and was obliged to borrow $300 from friends to get started. The place had practically no improvements. A three-room shack, worth less than $150, and the land had been cultivated but was mostly in blue grass.

I had never had any farming experience, but I watched my neighbors and did as they did. The first year set out one acre of strawberries and one-half acre of egg plant and raised corn and wheat. I started with 200 chickens; now have 500 chickens and milk 6 cows. Have 3 acres in asparagus, which has been yielding yearly about $500 per acre gross. Have one-half acre in grapes, 20 cherry trees, and altogether about 1 acre of orchard. Have been raising tomatoes, onions, rhubarb, potatoes, etc.

Have built a new one-story modern bungalow, 5 rooms, 30 by 36, with basement, probably worth $3,000. My place is all paid for except $1,500 Federal farm loan, which I plan to pay off in 1928 at the end of the first five-year period. Have no other debts and have an automobile.

I have a wife and four children; one finishes high school this year.

Have been getting about $3,000 a year gross returns from this place, from which living and operating expenses are paid, but have raised most of our living on the place from milk and butter, eggs and poultry, fruit and vegetables, etc.

I was located here by a real-estate man who is a countryman of mine, together with four other Italian farmers, all coal miners from Cle Elum and Roslyn, who located in this vicinity in July, 1919. None of us had ever farmed before, but all have succeeded and all are still here on their places. We all bought at the peak of prices, but all are fully or practically paid out now.

Land as good as mine and as well improved as when I bought, can now be had for $150 to $200 an acre, perhaps less.

My family is well satisfied and we have no intention of selling or moving.

Belle Fourche Farmer Grows Prize Seed

Sam H. Bober, of Newell, on the Belle Fourche project, S. Dak., has been notified that his exhibit of Grimm alfalfa seed at the International Grain and Livestock Exposition at Chicago was awarded first prize, defeating all other alfalfa seed exhibits from Western States and Canada.

The seed was produced on Mr. Bober's farm, 8 miles south of Newell, from a registered field of a special improved selection of a Grimm alfalfa which is superhardy and in actual tests has yielded more hay per acre than other strains of alfalfa. It is also an excellent seed producer.

Poultry Raising

(Continued from page 13)

tion. Personally, I prefer a large breed, and after trying out several have decided upon the Buff Orpingtons. They can scarcely be surpassed for table use, are good layers, and make wonderful capons. After 12 years' experience with my "back-yard" flock and 2 years' experience as leader of a 4 H. poultry club, where I have had occasion to examine carefully records other than my own, there is no question in my mind but that poultry raising can be made a very pleasant and profitable occupation in the Mesilla Valley.

Actual tests have demonstrated that while certain poor cows were yielding a profit of $16.78 per head good cows under similar conditions were yileding a profit of $47.64 per head, or nearly three times as much.

Unless the farmer is intelligent and aggressive enough to weed out his unprofitable cows, he himself is liable to be weeded out of the dairy industry.

Feasible or Not?

What Are the Factors That Decide?

UNDER the above caption, Modern Irrigation contains in a recent issue an exceedingly interesting and thoughtful article by Dr. W. L. Powers, of the Agricultural Experiment Station of the Oregon Agricultural College. Doctor Powers points out early in the article that "the unprecedented agricultural depression of the past few years, with low crop values on the one hand and increased cost of fitting and equipping irrigation farm units on the other, has increased the relative importance of economic surveys on proposed projects, and of readjustments in an economic way on existing reclamation enterprises." In other words, proper weight should be given not only to engineering problems but to the political, physical, social, and economic factors in the determination of a project's feasibility.

"Economic considerations such as location, marketing institutions, and transportation, vitally affect the earning power and cost of production. The cost of agricultural development is an important factor in irrigation economics. The cost of development and of production may be decreased by scientific agricultural methods.

"The ability and experience of the individual farmer in irrigation agriculture is a very important factor in profitable cropping. Conditions should be made such as will attract the experienced irrigation farmer, and only where these are promising will be induced to settle on raw land."

FINANCIAL AID NECESSARY

Doctor Powers is equally decisive in what he has to say about the necessity for adequate credit facilities in the early years of changing the raw land into a producing farm. "Agricultural credit facilities will be a determining factor in the feasibility of numerous new projects. The settler should have capital or equipment amounting to half of the capital required to develop a farm unit, but better agencies and methods for financing, to meet the balance of the capital need, must be developed. Water gives added value to arid land only if the lands are fitted and farmed. Raw lands in private holdings should be disposed of in suitable farm units at a minimum price to actual settlers."

A FINE EXAMPLE IN DURHAM

"A planned program of land settlement by the organized colonization method will hasten the rate of settlement and shorten the time required to bring farm units to a condition of profitable production. It is believed advisable to fit a part of each farm unit and seed to a perennial crop like alfalfa. New settlers should be encouraged to invest as far as possible in growing crops or 'live stock' and hold their investment in 'dead stock' or building equipment to the least necessity during the first years. The Durham Colony, in northern California, established in 1917, included 6,000 acres. It was put on the market in 1918 and by September, 1922, all the farms had been sold, and practically all the land was in either crops or pastures within five years from time of purchase. For projects of 10,000 acres and more, census figures show 66 per cent improved when these projects are 20 years old. These demonstrations point the way for private enterprises, as well as possible Federal reclamation activities."

Table showing cost of water to irrigators on Federal reclamation projects

State and project	Per acre charges: Construction 1925	Per acre charges: Operation and maintenance, 1925	Combined cost
Arizona-California:			
Yuma—			
Reservation	$3.60	$5.00	$8.60
Valley	4.50	5.00	9.50
California, Orland	3.30	1.60	4.90
Colorado, Uncompahgre	1.40	1.15	2.55
Idaho, Minidoka, S. S. Pump	3.38	1.50	4.88
Idaho-Oregon, Boise	4.64	1.00	5.64
Montana:			
Huntley	1.46	1.50	2.96
Sun River	1.67	1.10	2.77
Montana-North Dakota, Lower Yellowstone	.90	2.08	2.98
Nebraska - Wyoming, North Platte Interstate	3.30	2.00	5.30
Nevada, Newlands	1.95	2.00	3.95
New Mexico, Carlsbad	2.42	1.50	3.92
New Mexico-Texas, Rio Grande	1.80	2.20	4.00
Oregon:			
Umatilla—			
East	2.60	1.67	4.27
West	5.52	1.21	6.73
Oregon-California, Klamath	1.37	1.74	3.11
South Dakota, Belle Fourche	1.67	.95	2.62
Utah, Strawberry Valley	3.72	.70	4.42
Washington:			
Okanogan	3.76	11.21	14.97
Yakima—			
Sunnyside	3.12	2.00	5.12
Tieton	5.25	2.00	7.25
Wyoming, Shoshone, Garland	2.71	1.05	3.76
Average	2.91	2.28	5.19

NOTE.—The average annual cost per acre for water will be further reduced $1.26 an acre on 13 projects, due to new contracts being negotiated under crop repayment or 40-year plan.

Something for Nothing By Wise Crop Rotation

The starting point in business farming is crop rotation, or the establishment of systematic cropping systems to maintain soil productivity. The three farm practices which contribute most effectively to the production of such major crops as wheat, corn, and oats, are cultivation, crop rotation, and the use of fertilizers, both manure and commercial materials. These three operations rank almost equally in importance, but while the cultivation of the soil and the use of fertilizers are more or less expensive, rotation of crops does not appear as an item of expense in any farm cost-accounting system.

It is true that a farmer may spend time or energy in planning a rotation, that is, in determining a sequence of crops which will enable each crop to derive the maximum benefit from preceding crops and give the greatest benefit to subsequent crops, and in getting the rotation established on his farm. This, however, is counted as an expression of his managerial ability, for which he receives reward in the form of managerial income, if through good management he succeeds in realizing net profits. Thus, in rotation of crops, a farmer has at his command, without any monetary cost to him, a means whereby he can materially increase the output of his land and reduce crop-production costs.

Table showing costs of water to irrigators per acre per year on private irrigation projects

State and project	Cost per acre
California:	
Imperial irrigation district	$7.97
Santa Ana V. I. Co	12.97
Los Angeles County water works district	13.40
Glendora Mutual Irrigation Co	60.07
Modesto irrigation district	3.69
West Side irrigation district	9.00
Byron-Bethany irrigation district	11.16
Bonta-Carbona irrigation district	8.00
Idaho, Gem irrigation district	7.60
Oregon:	
Payette slope	7.20
Ontario-Nyssa	5.90
Washington:	
Cascade irrigation district	5.43
Natches Selah irrigation district	8.80
Union Gap irrigation district	6.62
Columbia irrigation district	6.17
Richland irrigation district	6.94
Wyoming:	
Riverton irrigation district	3.50
Hanover irrigation district	4.25
Big Horn Canal	4.00
Lovell Canal	4.00
Average	9.83

Organization Activities and Project Visitors

DR. ELWOOD MEAD, commissioner of reclamation, returned to the Washington office on December 13 after a two weeks' trip through the States of North and South Carolina, Georgia, Alabama, Mississippi, and Tennessee with the special advisors on reclamation and rural development.

George C. Kreutzer, director of reclamation economics, visited Walterboro, S. C., on December 9, to address a meeting of the Coastal South Carolina Agricultural Development and Industrial Association.

Russell S. Lieurance, formerly employed on secondary investigations and on the Klamath project, has been reinstated as assistant engineer in the Denver office.

Senor Lorenzo Lepori, civil engineer from Argentina, is visiting the North Platte, Shoshone, Sun River, American Falls, Boise, Yakima, Kittitas, Orland, Yuma, Rio Grande, Grand Valley, and Uncompahgre projects.

The representatives of the department and of private interests appointed to study and report on operation and maintenance work and results, consisting of R. C. Carberry, representing private projects; L. M. Holt, Indian projects; and P. J. Preston, Bureau of Reclamation projects, have visited and studied methods on the Turlock, Modesto, and Merced, Yuma, Imperial Valley, and Rio Grande projects.

Frank Adams, consulting engineer, spent several days on the Yuma project on work relative to the investigation of conditions on the Colorado River Delta.

C. B. Funk, chief clerk, has been transferred from McKay Dam to the Orland project and assigned to the Stony Gorge office.

Messrs. N. Shand and S. B. Shannon, engineers of the irrigation department of the South African Government, visited the Orland project recently to inspect the engineering and agricultural features of the project.

R. A. Blackmer, junior engineer on the Grand Valley project, has resigned to enter business with his brother near Los Angeles.

W. C. Funk, of the United States Tariff Commission, spent a few days on the Uncompahgre project investigating the cost of raising onions in the Uncompahgre Valley, to determine whether additional protection is needed for the onion industry through an increased tariff.

Ferd Schlapkohl, associate engineer, and W. P. Eaton, senior engineering draftsman, have been transferred from American Falls to the Owyhee project.

Visitors to Gibson Dam, Sun River project, included O. L. Wattis, president of the Utah Construction Co., and E. H. Myrick, forest supervisor, Lewis and Clark National Forest.

How They Grow Oranges in Orland

Oranges so big it takes only about seven of them to make a dozen are not seen every day, but that is the sort M. S. Pritchard, a water user on the Orland project, California, is growing. The local editor was presented with a number of them weighing more than a pound each. These are navel oranges, the kind Orland is producing in commercial quantities. Mr. Pritchard is worried for fear all his oranges will prove too large to market. He might sell them as a new variety of grapefruit.

B. E. Hayden, industrial agent, spent several days on the North Platte project in connection with exchange of entries and changes in irrigable areas on the interstate division.

O. L. Rice, junior engineer, has been transferred from the Salt Lake Basin investigations to the position of office engineer at Guernsey Dam, North Platte project.

Mr. Carson, of the Geological Survey, visited the Klamath project recently to obtain equipment and data to tie Bureau of Reclamation levels to those of the United States Geodetic Survey.

L. S. Bailey has been transferred from the Vale to the Owyhee project.

F. A. Banks, resident engineer at American Falls, has been placed in charge of the Owyhee project.

A. T. Strahorn, of the Department of Agriculture, who has been in charge of the soil survey on the Yakima, Yakima-Benton, and Kennewick irrigation districts, has returned to his headquarters in Washington, D. C.

Walker R. Young, construction engineer, Kittitas division of the Yakima project, visited the hydroelectric construction work being done by Grant, Smith & Co., at Lake Chelan, to obtain first-hand information on sand inundation and the use of "cellite" in concrete.

H. E. Dickinson, general superintendent; D. M. Davis, assistant general freight and passenger agent; J. Lever, division freight and passenger agent; and W. F. Carroll, division superintendent, all of the Chicago & North Western Railway, were recent visitors on the Riverton project.

Col. B. F. Fly, guardian of the Yuma Mesa, is a frequent and welcome visitor at the Washington office.

Gov. George H. Dern, Dr. John H. Widtsoe, William R. Wallace, and Oliver J. Grimes, of Utah, spent several days on the Yuma project to gain first-hand information concerning the Colorado River situation in connection with proposed legislation for the construction of Boulder Canyon Dam and the development of the Colorado River Basin.

Julian Hinds, until recently assistant designing engineer in the office of the Chief Engineer in Denver, has been awarded the Norman medal of the American Society of Civil Engineers for his paper on Side Channel Spillways; Hydraulic Theory, Economical Factors, and Experimental Determination of Losses. This medal is awarded annually by this society for the best paper submitted by a member during the year and considered worthy of special commendation for its merit as a contribution to engineering science.

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1926

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards,** Assistant Secretary; **E. O. Patterson,** Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary; **J. H. McNeely,** Assistant to the Secretary; **W. B. Acker,** Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — George C. Kreutzer, Director of Reclamation Economics — P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell				
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg.	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands	Fallon, Nev	D. S. Stuver	G. B. Snow	Miss E.M.Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte	Mitchell, Nebr	H. W. Bashore	L. H. Mong	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	American Falls, Idaho	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [3]	Phoenix, Ariz	C. C. Cragin [4]				
Shoshone	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley	Provo, Utah		H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg		C. M. Voyen	C. M. Voyen	B. E. Stoutemyer	Portland, Oreg.
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Boise, Idaho	R. J. Newell			B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	B. E. Stoutemyer	Portland, Oreg.
Yuma	Yuma, Ariz	P. J. Preston	M. J. Gorman	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

Large Construction Work

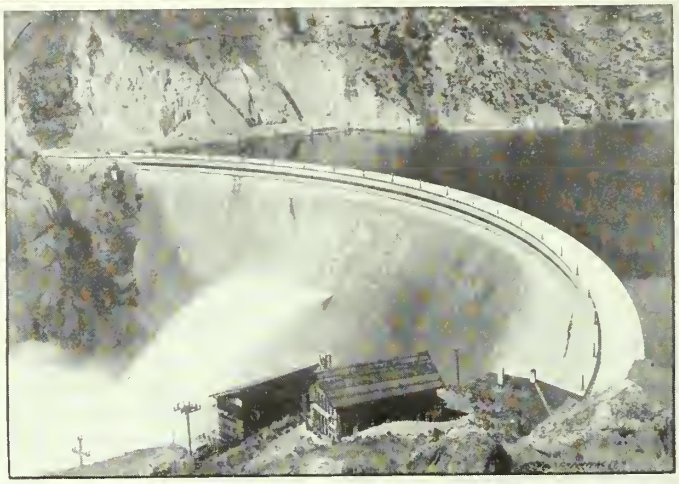
Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks [5]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [5]	Chas. Klingman	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [6]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam	Augusta, Mont	Ralph Lowry [6]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [6]	C. B. Funk		R J. Coffey	Berkeley, Calif.

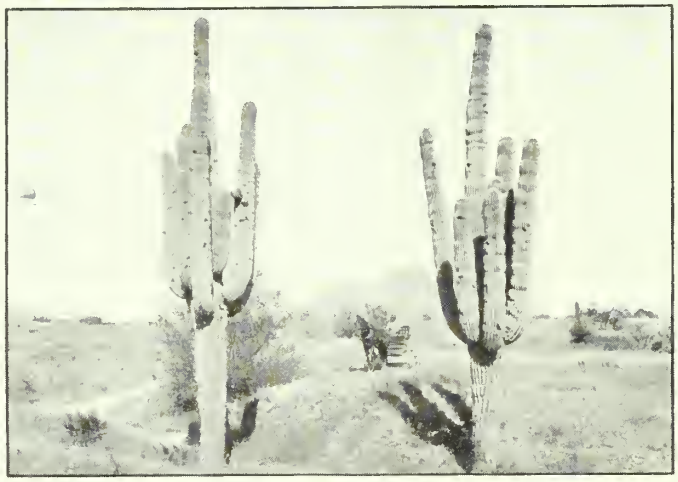
[1] Project operated by Nampa-Meridian, Boise-Kuna and Wilder irrigation districts.
[2] Project operated by King Hill irrigation district.
[3] Project operated by Salt River Valley Water Users' Association.
[4] General Superintendent and Chief Engineer.
[5] Resident Engineer.
[6] Construction Engineer.

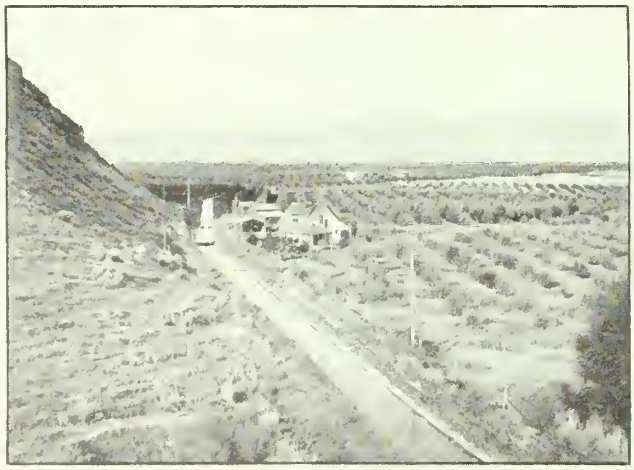
Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Spanish Springs storage	Fernley, Nev	A. W. Walker	
Payette division, Boise	Boise, Idaho	R. J. Newell	
Gooding	Jerome, Idaho	W. W. Johnston	
Middle Rio Grande	Denver, Colo	I. E. Houk	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.
Heart River	Denver, Colo	G. E. Stratton	
Yakima project extensions	Yakima, Wash	J. L. Lytel	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.







IRRIGATION RECLAMATION IN A NUTSHELL

THE SOURCE OF THE WATER
THE WATER CONSERVED
THE DESERT
THE CARRIER
CROPS
LIVESTOCK
FACTORIES
HOMES

I 27.5: 1927

NEW RECLAMATION ERA

Clemson College Library

VOL. 18 FEBRUARY, 1927 NO. 2

CANAL AND TUNNEL ON THE GRAND VALLEY PROJECT, COLORADO

Clemson College Library
Government Publications

FURTHER EXTENSIONS OF TIME OF REPAYMENTS NOT JUSTIFIED

TAKING THE POSITION that any extension of time for construction repayments due on Federal reclamation projects at this time would nullify a vital policy adopted by the Government, Secretary Work, of the Interior Department, on January 14, 1927, addressed a joint letter as follows to the chairmen of the Senate and House Committees on Irrigation and Reclamation:

"In compliance with the understanding had at the conference in this office on January 8, I submit a statement of the action which the department believes should be taken with reference to requests for extensions of time for construction repayments under existing twenty-year contracts.

"These requests urge inability to meet these payments, stating their projects are placed at a disadvantage as compared with those projects for which charges were adjusted under the acts of December 5, 1924, and May 25, 1926.

"It is the view of the department that no extensions should be granted at this time. To do so would nullify a policy adopted by the department which we believe to be vital. In some cases these payments can be made under the present contracts and ought not to be extended. In others, they are projects of high crop return and in the past payments have been met. The concessions made under the adjustment act and amendments under the Fact Finders' Act have caused great anxiety to friends of reclamation regarding the success and wisdom of Federal reclamation. Further extensions of the period of repayment at this time will strengthen this unfavorable sentiment.

"During the coming year it is proposed to make a comparative study of the charges on these and other projects and of their ability to meet their obligations under existing contracts. Action to remedy any inequalities found to exist will then be taken.

"Requests have recently been made for temporary deferment of delinquent operation and maintenance charges. Where the necessity for such deferment has been shown, it has been agreed to for periods varying from one to three years, part of the payment to be in cash and the remainder in equal payments for the time granted, with interest at 6 per cent.

"This is a policy the department believes to be sound and necessary to the success of Federal reclamation and one which we hope Senators and Congressmen from reclamation States will support."

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 FEBRUARY, 1927 No. 2

Interesting High Lights on the Reclamation Projects

CARLOAD shipments of agricultural products from the Yuma project during 1926 totaled 3,223, valued at $3,307,400.

AT Stony Gorge Dam, Orland project, excavation was begun on December 6, and during the month 1,575 cubic yards of material were removed. Foundations and anchorages were being prepared for three cableways.

THE board of directors of the Orland Unit Water Users' Association has agreed to underwrite the expense of preparing an illustrated booklet describing the Orland project and the unsettled lands which are available for sale, at a cost not to exceed $1,000, to be repaid as a part of the 1927 operation and maintenance cost.

RANGE cattle and sheep continue to be brought to the Grand Valley project from adjacent ranges, and a larger number than ever before are consuming the pasturage and forage on the project. Sheep predominate, and the season has been very favorable for this industry.

COLLECTIONS of charges on the Uncompahgre project during December exceeded $80,000, which is approximately $6,000 more than the amount received during the same month in 1925.

ABOUT 50 tons of dressed turkeys, valued at $45,000, were shipped from the Orland project consigned to the Christmas markets in the San Francisco Bay region.

REPAYMENTS of charges in full on construction, due December 31, have been made by the New York, Boise-Kuna, Nampa-Meridian, and Wilder districts of the Boise project.

THE first semiannual installment of construction charges payable by the Burley irrigation district, Minidoka project, under the contract of March 15, 1926, came due on December 31 and was paid in full by the district.

THE Laabs Cheese Co. has purchased a factory site just outside the town of Rupert, Minidoka project, and will soon move the present Rupert plant to the new location, upon which a modern cheese-making establishment will be erected.

THE Utah Construction Co. started actual construction work on the Gibson Dam, Sun River project, during December. Air lines were extended to various parts of the work and excavation of rock was commenced. A start was also made on the open cut excavation at the spillway tunnel outlet.

OPTIONS have been obtained on the Lower Yellowstone project covering about 8,400 acres of land for sale. The Northern Pacific and the Great Northern railroads will advertise the project in about 30 farm papers. An illustrated booklet, describing the project and its opportunities, is in course of preparation.

AT Guernsey Dam, North Platte project, concrete work was continued on the drum crests and end piers of the south spillway. The 24-inch pipe and valves and the needle valves for the operation of the drum gates have been installed.

TAKING the holiday trade as a criterion, the Newlands project enjoyed a prosperous year. The merchants of Fallon state that their holiday stocks were almost entirely depleted, and comment smilingly on the fact that their customers are looking for the better grades of merchandise.

AN active campaign is being inaugurated on the Milk River project by the county agent to interest adjacent dryland farmers in irrigated lands. The local organizations and large owners are displaying considerable activity in the movement, and it is expected that a constructive plan will be formulated providing for project settlement and development.

THE first annual Klamath County Potato Show was held recently at Klamath Falls, with more than 100 entries from 60 different growers. At the close of the show all exhibits were auctioned off, netting nearly $300 for the 1927 show. One lot of 200 pounds sold for 50 cents a pound.

THE physical care, operation, and maintenance of the Strawberry Valley project works were turned over to the Strawberry Water Users' Association on December 31, 1926.

AT the end of December nearly the entire crop of apples on the Okanogan project had been sold and shipped with the exception of the Winesaps. The greater part of this crop was being held in the expectation of a rise in price.

WORK by the General Construction Co. on the construction of the first division of the main canal, Kittitas division, Yakima project, was continued until December 11, when, owing to a severe snowstorm, the contractor decided to suspend operations for the winter.

RETURNS from Yakima County agricultural products during 1926 amounted to $40,650,170, or second only to the banner year of 1925, according to the annual crop report of C. A. Foresman in a recent issue of the Yakima Morning Herald.

Cooperation of Federal Government and State in Development of Irrigation Projects [1]

By Elwood Mead, Commissioner of Reclamation

THE Washington Irrigation Institute has won an enviable reputation for serious purpose and solid achievement. I welcome, therefore, the opportunity to present to its members what I believe should be the basic principles of irrigation development and to urge cooperation between the States and Federal Government. I shall use the Kittitas project in this State as a typical example of conditions under which future reclamation must be carried out.

The works to irrigate the Kittitas lands are being built under a contract between the United States, acting through the Interior Department, and the Kittitas reclamation district. The district contracts to repay the entire cost and makes this obligation a lien on the land. Of this land, the United States owns 5,000 acres, the State owns 1,500 acres. The remainder, about 63,500 acres, is privately owned. A small percentage is now irrigated from small ditches which will be abandoned. The irrigated portion is highly improved. The owners can use the improved water supply as soon as it is available. There need be no misgivings about this part of the land meeting its obligations.

No one can now predict with certainty what will happen on the unimproved area. It will carry an obligation to repay nominally about $160 an acre construction cost. In reality, the present worth of this repayment is far less because of the subsidy contained in the generous terms of payment, which is 5 per cent of the yearly crop return. If, through poor farming, the crop is only worth $30 an acre, the settler will pay $1.50 a year. That is less than 1 per cent of the cost. If the land is properly cultivated, crops ought to be worth $50 an acre. Then the yearly construction payment will be $2.50, which would give more than 60 years in which to repay the construction debt. Compared to the conditions of payment under private projects, where 6 per cent interest has to be paid on the bonded indebtedness, the Government's terms are equivalent to a gift of over $100 an acre of the construction cost.

The price of water rights will not, therefore, be a heavy burden. It will not deter settlement nor cause settlers to fail. Operation and maintenance charges, county and State taxes, will be more serious matters. Together they will be somewhere between $2.50 and $5 an acre, depending on how much is spent for roads and schools. All the irrigation payments will be low when contrasted with the payments under private works built in recent years.

SETTLEMENT AND FARM DEVELOPMENT

This brings us to the serious and unsolved problem of American reclamation. It is, how is the worthy settler of small means to pay for the land and change a patch of unleveled sagebrush into a farm? Until we have answered this question we can not claim to have a reclamation policy.

We are working toward a solution at Kittitas. The privately owned land has been appraised and this appraisal has been approved by Secretary Work. Fixing the unimproved value will bar the land speculator who worked such wrong to settlers on older projects. But we have not fixed the terms of payment. These ought to be amortized and extend over not less than 20 years. Fifty years would be better. The interest ought to be 5 per cent. If the Government provides interest-free money to build canals, landowners or the State ought to give low interest in selling land.

The law governing the disposal of State land in this project ought to be amended by the next legislature. As it now is, the land can only be sold at auction and for cash. The minimum price per acre is more than twice the value fixed by the appraisers. Selling for cash takes money a settler needs for improvements. In this enterprise to which millions of Federal money will be donated, the State under the present law is a profiteer, making the settler pay more than the land is worth and taking no chances.

But cheap land and cheap water will not by themselves insure the prompt and successful settlement of this project. We need a thought-out scheme for the improvement and equipment of farms. Every irrigation country but ours has it. Kittitas ought to have it.

I say this to the members of the institute with confidence that it will have attention. I know the State of Washington has a higher purpose in this development than to make money. Your aspiration is to have Kittitas be an object lesson in how to create permanent and prosperous homes on the land. That you desire it to be a district of farm owners instead of tenants of mortgage companies.

RURAL PLANNING

The first step is to lay out the ditches, roads, and farms so as to meet the needs of an intensively developed closely settled area. We must look ahead 20 years and plan this as industrial enterprises are planned. A splendid beginning has been made in the Badger Pocket section. The size of farms should be varied, so that all who love farm life may have a chance. There should be 5-acre farms for the worker without money, and 160-acre farms for those with money and ability to manage.

We can save money, time, and worry by clearing and leveling land in advance of settlement. There ought to be a booklet of houses and barn plans. Over a thousand houses will be needed. We must employ a first-class business adviser to help settlers work out cooperative plans for buying at wholesale and selling as a community.

CREDIT IN DEVELOPING AND EQUIPPING FARMS

We now come to the missing link in American irrigation development. This is the absence of financial aid in the development and equipment of farms. Every other country but ours provides it. Sooner or later we will also. I take it that the private landowners on this project will follow the Government's lead and accept worthy settlers who have $2,500 in cash or equipment. I hope the members of this institute will put themselves in the place of the settler with this capital, then take a pencil and paper and put down the things he will need on his farm to make it a going concern, and their cost. You will be surprised at the result. Then find, if you can, where the settler can get the additional money required, on terms that agriculture can afford. We lose the benefits of all other things if we compel the settler to pay 8 or 10 per cent interest on the money he has to borrow to develop his farm, or delay development by inability to borrow on any terms.

Australia meets that situation by advancing $3,000 as loans on farm improvements. Denmark loans up to 75 per cent of the cost of land and improvements. Other countries do more. We are lavish in our subsidies for canals but ignore the needs of the farm. As a result, the farms on some of the older projects are falling into the control of mortgage companies. No one wants that result on Kittitas, but

[1] Paper presented to Washington Irrigation Institute at annual meeting Jan. 6–7, 1927, Seattle, Wash.

it will happen unless more and cheaper money is made available for farm development.

It should not, however, be advanced to settlers as loans. It should be made as payments on improvements, the character and cost of which were approved before they were started. Easy access to money tends to make borrowers improvident. They buy flivvers instead of building barns and leveling land. What I am urging is a service in farm development on a business basis to enable the money needed to pay for canals to be earned on the farm.

It will require from $3,000,000 to $5,000,000 in addition to settlers' capital to make Kittitas farms what they ought to be. The interest rate on this ought not be more than 5 per cent; the repayment period ought to be that of Canada and our Federal Land Bank, which is 34½ years. The expenditure of that money ought to be in the hands of a careful, experienced business man who would only provide it to those who were workers and stayed on the job.

If an emergency fund of that kind were provided, which would enable them to go on when their capital was all spent, it would be a lodestone to draw to Kittitas the canny, careful type of farmer. It would enable him to see his way through. It would save heart-breaking delays and many tragedies of foreclosure of short-time loans.

On general principles, I would like to see this money and this oversight of farm development provided by the State. It has an intimate knowledge of conditions. It benefits largely from increase in farms and taxable values and from the products and trade that result from irrigation. But the tendency in this country is toward centralized instead of a decentralized administration, and we must recognize that if the local authorities do not wish or are not able to perform these functions it is unwise to insist on thus attempting them.

At present, neither Federal nor State authorities look with favor on aiding the settler improve his farm. They do not yet realize its importance or necessity. It means assuming a large responsibility and providing more money. The disposition is to postpone action and wait like "Micawber" for something to turn up.

We can not, however, afford here to repeat the settlement methods or be satisfied with the results obtained on some of the older projects. On these, underfinanced settlers, partial improvement of farms and ruinously high interest rates have caused so many mortgage forclosures that banks and mortgage companies are land poor. Sixty-three per cent of the farms on one project are cultivated by tenants. This leads to poor crops and impoverished soil. A movement is on foot to pool these farms and start a new era of settlement. The Reclamation Bureau is cooperating in a coordinated settlement scheme on four of the older projects. What this includes is illustrated on the Lower Yellowstone, where the owners of 8,000 acres have made the Reclamation Bureau a selling and settlement agent. The prices of farms have been fixed by impartial appraisers; the time in which to complete payments has been made 20 years. The interest rate is low—nowhere more than 6 per cent. With all these favorable conditions, it is still uncertain where and how we will find the kind of farmers the project needs.

In December a conference about this was held in Chicago, attended by E. C. Leedy and W. S. Webber, representing the Great Northern Railway; H. W. Byerly, representing the Northern Pacific Railway; W. S. Milhiser, manager, Holly Sugar Co., Sidney, Mont.; and George C. Kreutzer, of this bureau. This meeting resulted in the following plans for settling the Lower Yellowstone project:

Booklet.—A booklet is to be published by the bureau. It was agreed it should include the following:

Peach and pear trees with cantaloupes between the rows, Yakima project, Washington

A well developed home on the Lower Yellowstone project, Montana-North Dakota

(1) The plan of fixing prices, appraisals, and uniform selling contract to be explained fully.

(2) Table of farms comprising 8,000 acres to include gross area, irrigable area, price per acre, initial deposit, and half-yearly payments.

(3) Soil and climatic conditions to be explained.

(4) Character of crops that can be grown and yields.

(5) What a few of the good farmers in this project are doing, showing yields, incomes, and other information of interest to settlers.

(6) Cost of water and how charges are to be paid.

(7) The value of irrigation water in this section to be brought out.

(8) Taxes and other charges.

(9) Plans and estimates of cost of two modest cottages to be included and furnished by Mr. A. Vaux of Sidney, Mont.

(10) A list of the cost of farm equipment to include work horses, dairy cows, farm tools, and of materials commonly used for buildings and development.

(11) Transportation facilities.

(12) Sugar factory and other industries.

(13) Guidance and advice to settlers by bureau and other agencies.

Posters.—It was agreed that posters be printed for distribution in post offices. They would include reference to Belle Fourche, Lower Yellowstone, Willwood, Riverton, and (Tule Lake lands on) Klamath project.

Advertising.—The railroads will either advertise jointly or divide the farm journals and advertise separately. They intend to put liner ads, featuring the plan and the Lower Yellowstone project, in such papers as Wallace's Farmer, Wisconsin Farmer, the Capper publications, Hoard's Dairyman, Utah Farmer, and others, totaling about 30 in number.

Follow-up work.—The Great Northern Railway has eight traveling field men working in the Middle West and the Northern Pacific four such employees. The representatives agreed to turn all live inquiries over to these field men to make personal visits to them and endeavor to have them consider settling at Lower Yellowstone.

Beet farms.—One special representative is to be engaged by the Sidney Chamber of Commerce, to get beet farmers from the beet-growing districts of Colorado and other irrigation sections, the period of employment of this man to be one year (estimated cost including salary and expenses about $6,000).

Credit.—These representatives were told of our anxiety to have better credit extended to new settlers, that they could not afford to pay 10 per cent interest on money borrowed to make improvements and buy equipment. Both Messrs. Leedy and Byerly promised to call on the St. Paul Federal Land Bank and the Spokane Federal Land Bank for the purpose of having farm loans extended to this project. Intermediate credit is extened to a certain extent by the Agricultural Credit Corporation of Minneapolis. A thousand dollars is loaned to thrifty settlers for the purchase of dairy cows, breeding ewes, or purebred sires. This corporation financed 125,000 ewes in three years; 70,000 of these were secured last year. Have loaned over $800,000 at 6 per cent interest on three years' time. Have helped settlers buy 6,000 head of dairy cows; this year 1,800 cows were purchased.

Mr. Leedy stated that the Monarch Lumber Co. of Montana was financing settlers with building material, one-third cash, balance on time. It is understood that they have a yard on the project. (This will be looked into.)

The Holly Sugar Corporation supplies banks with money required to grow the beet crops on the project and charges the banks 3 per cent interest. The banks, in turn, charge farmers 10 per cent. Farmers require this money in July and repay it in November out of the crop. Some means of direct contact between the sugar corporation and beet growers seems desirable. Other than the agencies mentioned above, which include local banks, there is no other form of credit now available for new settlers.

Resident economist.—It is anticipated that this program can be put into effect early in January, when the booklet will be prepared and the Civil Service Commission will have certified an eligible list from which to select a man to take charge of the land settlement work on the project.

This is somewhat cumbersome but it is better than leaving the farms idle. It will be noted, however, that the meeting was not attended by representatives of the counties in which the project is located, or the States of Montana and North Dakota, though these are the two agencies most vitally interested in this development. The people who settle there will be citizens. Every good farmer means

(Continued on p. 21)

Beet dump and factory at Sidney, Lower Yellowstone project, Montana-North Dakota

Progress on Belle Fourche Project

PLANS for the construction of a sugar factory at Belle Fourche are going forward and it is expected that actual work on the site will begin about February 1. The Utah-Idaho Sugar Co. required signatures to beet-raising contracts as a preliminary step, and this was met promptly by local farmers signing up for about 8,000 acres, including areas in the Spearfish Valley.

The publicity which the project received in connection with the sugar factory was followed by an inrush of beet farmers from the Nebraska district and others interested in irrigated farms from North Dakota and from the drought areas of South Dakota. These were nearly all tenant farmers, although a few places have changed hands. As many as 15 renters in one day were looking for farms. On December 3 a Newell firm placed six new men, who together proposed to raise 200 acres of beets. Nearly all farms that contain a set of buildings were rented at the close of the year.

Options on 95 farms covering 6,358 irrigable acres were closed during the year. This, together with the State-owned land brings the listing to 10,478 acres, or slightly above the requirements of the supplemental contract.

CROPS

Crop production on the Belle Fourche irrigation project shows a total return of $880,317 for the season of 1926. The yield per acre increased 10 per cent over the previous year, which indicates that specialized crops are receiving increased attention.

Alfalfa, which is one of the basic crops in rotation with sugar beets, corn, and grain, occupies first place in both acreage and value. Thirty-four thousand tons of this hay are available for winter feeding of livestock, with the excess finding a market in the Black Hills and points farther east. Sixty-five tons from 13 acres are reported from one farm 2 miles east of Nisland, where a bunch of sheep are on the job to turn this bulky crop into more intensive values.

Corn is the project's second most important crop. Eight thousand acres of this grain yielded up to 73 bushels per acre, with 50 to 60 bushels per acre quite common. Sheep, hogs, and cattle are turned into the fields, and not only husk the corn but pasture extensively on the leaves and stalks. A portion of the crop is siloed or cut for winter roughage, and little or none of the grain finds its way to market, because of the demand from local feeders. A farm adjoining the town of Vale produced 2,400 bushels on 40 acres, and the value of the crop is estimated to be two-thirds of what the land could have been bought for last year.

Sugar-beet acreage increased 75 per cent over the previous year, and, with a factory assured, it is expected that this crop will treble the next season. Under the Government portion of the irrigated district 25,000 tons of beets were delivered to the dump, and $200,000 in cash was realized as the total returns in 1926. Gus Fredlund, of Newell, harvested 20 tons per acre, which is a record for the gumbo soils.

WORLD'S LARGEST SALTING STATION

Growing cucumbers for pickles continues to meet with favor on the project, and many farmers last year realized $300 to $700 from small patches of this specialized crop. The possibilities of this section for production of pickles is emphasized by the fact that at Nisland there is already the largest salting station in the world, and in addition the Squire-Dingee Co. expects to erect two more vat plants on the project to handle next year's crop. Eugene Adams, of Vale, raised 1,150 bushels of cucumbers on 2½ acres, and the cash returns were at the rate of $300 per acre.

Small grains yielded well under favorable weather conditions that prevailed in 1926. Fred Ross, of Arpan, raised 4,000 bushels of wheat on an irrigated 80, which tops the record for production on a large acreage. Oats yielded 90 bushels on the Townsend farm near Nisland, with 1,980 bushels on 22 acres. The Gladden farm, near Vale, produced 1,375 bushels of barley on 25 acres, which is at the rate of 55 bushels per acre. Coarse grains, as a rule, are consumed locally in sheep-feeding operations, and wheat is grown as a cash crop on some rented farms where stock is limited, or where large holdings require grain farming.

Salt River Farmers Realize Big Profits

The Associated Arizona Producer states that the farmers on the Salt River project will receive an additional annual income of $250,000 without the increase by a single dollar in the existing investment, through a contract made recently with the Nevada Consolidated Copper Co. for the sale of power for use in the Ray mines. This means $1 a year more to the farmers for each acre of land in the project.

The value of farm products on the Salt River project approximates $25,000,000 annually. In addition, when the Horse Mesa Dam is completed, the farmers on the project will realize annually under existing guaranteed contracts an income of $2,500,000 from the sale of power.

Cooperation in Development Of Irrigation Projects

(Continued from p. 20)

an increase in taxation for the county and State, an increase in business for the towns and railroads. The towns and railroads understand it and are making large contributions. That the county and State are not doing anything is not an evidence of unfriendliness. It does indicate that the local authorities do not as yet recognize their responsibility. I believe this aloofness and indifference should be changed and am confident it will be.

I hope that your institute will enlist the State as a responsible partner in the settlement of Kittitas and the projects which will follow in this State.

Capital Reported By Prospective Settlers

During 1926 settlement cards were filed in the Washington office from 209 prospective settlers on the irrigation projects. Among the questions to be answered on the card is one relating to the amount of capital the prospective settler has available. A tabulation of the replies to this question indicates that a considerably larger number of men with a reasonable amount of capital are being heard from than in previous years. The tabulation follows:

Available capital	Number of inquirers	Per cent of total
Less than $500	17	8
$500 to $1,500	52	25
$1,501 to $2,500	42	20
$2,501 to $5,000	48	23
Over $5,000	19	9
Not stated	31	15
Total	209	100

President Approves First Division, Salt Lake Basin Project

The Secretary of the Interior concludes that the project is feasible from an engineering and economic standpoint, based on searching investigation of water supply, engineering features, cost of construction, land prices, and probable cost of development

PRESIDENT COOLIDGE on January 8, 1927, approved the construction of the first division of the Salt Lake Basin project, Utah, as submitted to him in the following letter from the Secretary of the Interior:

DEPARTMENT OF THE INTERIOR,
Washington, January 7, 1927.

The PRESIDENT,
The White House.

MY DEAR MR. PRESIDENT: I wish to make, concerning the first division of the Salt Lake Basin project, in Utah, the following statement and finding of feasibility:

Section 4 of the act of June 25, 1910 (36 Stat. 835), provides, in effect, that after the date of that act no irrigation project to be constructed under the act of June 17, 1902 (32 Stat 388), and acts amendatory thereof or supplementary thereto shall be undertaken unless and until the project shall have been recommended by the Secretary of the Interior and approved by the direct order of the President.

Subsection B, section 4, act of December 5, 1924 (43 Stat. 701), provides as follows:

That no new project or new division of a project shall be approved for construction or estimates submitted therefor by the Secretary until information in detail shall be secured by him concerning the water supply, the engineering features, the cost of construction, land prices, and the probable cost of development, and he shall have made a finding in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.

The various features of the first division of the project requiring investigation and report under subsection B, section 4, act of December 5, 1924, *supra*, will be discussed in the order in which presented in that subsection, as follows:

WATER SUPPLY

Source.—Weber River has a mean annual flow of about 570,000 acre-feet. There is sufficient flood water in the Weber River to fill the Echo Reservoir (which the United States proposes to construct) in most years with holdover from years of large run-off. It will be possible to fill the reservoir on an average of three years out of four based on records for the past 20 years. By exchange of Echo Reservoir storage and diversion of surplus Weber River flood waters, about 15,000 acre-feet can be diverted annually from a point on the Weber River above the reservoir to the Provo River by means of a canal through the Kamas Bench. By this means it will be possible to lengthen the flood-flow season and increase the low-water flow on the Provo River.

Storage capacity.—The storage capacity of Echo Reservoir on Weber River is 74,000 acre-feet.

ENGINEERING FEATURES

Storage dam.—The proposed dam is to consist of an earthen embankment across Weber Valley about one-half mile above the town of Echo, Utah. The maximum height of the dam will be 125 feet and its length about 1,800 feet. The face of dam is to be protected by riprap consisting of 4 feet thickness of dump rock. The spillway capacity is to be adjusted for floods of 15,000 second-feet. Outlet works will have a capacity of 1,200 second-feet. The embankment will contain about 1,400,000 cubic yards of material.

Main diversion canal.—A diversion canal is proposed to be constructed to conduct the waters of the Weber River across the Kamas Bench to the Provo River system for use on lands in Utah and Salt Lake Counties. This canal is to be located about 25 miles upstream from Echo Reservoir, and is to be about 8 miles in length with a capacity of 210 second-feet.

Laterals.—No canals (other than the diversion canal), laterals, or drainage construction is contemplated as a part of the first division of the project, the plan being simply at the present time to supply storage facilities for areas under existing canals in the Weber and Provo River Valleys.

Drainage.—No drainage will be provided at this time for the first division.

COST OF CONSTRUCTION BY FEATURES

Storage dam (including relocation of Union Pacific Railroad and Lincoln Highway, rights of way, etc.)	$2,700,000
Diversion canal from Weber River to Provo River	300,000
Total, first division of Salt Lake Basin project	3,000,000

TOTAL COST

As shown above, the total cost of the first division of this project is estimated to be about $3,000,000.

LAND PRICES AND PROBABLE COST OF DEVELOPMENT

The first division of the Salt Lake Basin project will benefit about 80,000 acres of irrigable land in the counties of Summit, Morgan, Weber, Davis, Wasatch, Utah, and Salt Lake, Utah. All of this land is colonized and settled and a supplemental or late season water supply will be provided. The soil consists of loam, clay loam, and sandy loam. Good crops of alfalfa, sugar beets, wheat, fruits, canning produce, and other crops common to this altitude (between 4,000 and 5,000 feet) are raised. Excellent marketing and transportation facilities exist. As an example of farm income, crop values on four typical farms are given:

	Area	Total crop value	Crop value per acre
	Acres		
1	32.0	$2,509	$72.00
2	24.0	1,768	73.00
3	20.0	1,143	57.00
4	26.0	1,260	49.00
Average	25.5	1,670	65.60

FINDING REGARDING FEASIBILITY OF PROJECT

The foregoing data justify the conclusion that the project is feasible from an engineering, agricultural, and economic standpoint, and I accordingly so find and declare.

ADAPTABILITY OF LAND TO SETTLEMENT AND FARM HOMES

The land embraced in the project is of more than average fertility. The area included within the project can be utilized in production of crops and is prepared for the effective application of water. Good yields of all crops grown in this locality are assured. The farmers at present on the lands as a rule have savings and checking accounts in the local banks, are industrious, pay their debts, and constitute a solid class of citizens in the State of Utah.

PROBABLE RETURN TO RECLAMATION FUND OF COST OF CONSTRUCTION

A contract is about to be entered into with the Weber River Water Users' Association for repayment of the cost of the

project on the basis of 20 equal annual installments. The works can be completed in less than five years, if Congress appropriates the necessary funds, and payments in accordance with the terms of the proposed contract will begin on December 1 of the year in which the Secretary announces the completion of expenditures for the first unit. The average construction cost of this division of the project will probably be about $40 an acre, making the average yearly payment $2 an acre. To this will be added the annual expense of operation and maintenance.

The total yearly charge will not be greater than the irrigators can pay, and it is believed that the additional water supply will increase incomes so as to enable the irrigators to meet the required payments on this project.

The settlers will be under specially favorable conditions to respond to the development due to the increased water supply. The agricultural production in the Nation is not keeping pace with increase in population. These lands must continue to be intensively cultivated and the settlers will be helped so far as practicable to organize for cooperation in production and marketing. The favorable conditions recited justify the belief that this project will return the cost thereof.

Because of the urgent need for a larger water supply by the present settlers on the 80,000 acres to be benefited by the first division of the project and because of the additional development of this area which will ensue from the construction, the project is destined greatly to benefit the Nation. I recommend approval of the first division of the project as outlined and request authority to make contracts for and to proceed with its construction.

Very truly yours,

HUBERT WORK.

Approved January 8, 1927.

CALVIN COOLIDGE,
President.

Group-Settlement Plan In Western Australia

A group-settlement scheme is carried on in Western Australia under which a free grant of Crown land up to 160 acres is made to selected applicants. These settlers work together for two to two and a half years, putting up buildings and clearing and preparing the land for farming. They are under the direction of a foreman and are paid 10 shillings for maintenance each day they work. At the end of the period they are expected to become self-supporting and the cost of improvements on each block is repayable by the settler, a 30-year term being allowed.

Cold Storage in the Yakima Valley

By J. L. Lytel, Superintendent, Yakima Project

OF THE 350,000 acres under irrigation in the Yakima Valley, Wash., approximately 48,000 acres are in fruit, including apples, pears, peaches, plums, cherries, etc. Of this, 35,863 acres are located on projects developed by the Department of the Interior, comprising 31,600 acres within the Yakima project of the Bureau of Reclamation and 4,200 acres on the Wapato Indian Reservation developed by the Bureau of Indian Affairs.

The packing, storing, and marketing of the crop produced in the area in orchards has developed into an industry of appreciable size, and in connection with it cold-storage plants have been constructed throughout the Yakima Valley with a total capacity of 7,280 carloads.

The accompanying table shows the capacity, in carloads, of the cold-storage plants located in the various districts in the valley.

This storage is provided in 33 cold-storage plants with capacities varying from 5 to 700 carloads each, and is controlled as follows: Fruit dealers, 71 per cent; cooperative marketing organizations, 29 per cent.

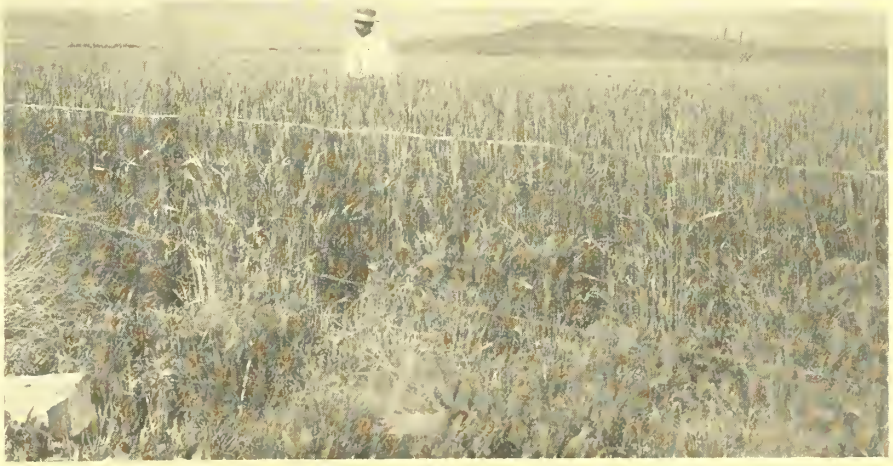
With adequate and properly located cold-storage plants, the growers and local cooperative selling agencies are able to keep control of the crop until they are ready to sell, and thus to a considerable extent save themselves from the necessity of placing their product in the hands of consignment dealers. It also enables them to put their crop on the market in prime condition, helps to prevent glutting the market, and is of material aid during the time of car shortage, local storage usually being cheaper than foreign storage.

	Capacity
DISTRICTS	*Carloads*[1]
Zillah district	550
Yakima district	4,435
Wiley City and Yakima Valley points	275
Tieton project	75
Selah district	255
Reservation district	390
Kennewick district	245
Grandview district	375
Donald-Buena district	400
Naches Valley	275
Kittitas Valley	5
Total available storage	7,280
OWNERSHIP	
Commercial dealers	5,170
Cooperative organizations	2,110
Total	7,280

[1] All quantities, carloads of 756 boxes of apples.

It is estimated that the construction cost of cold-storage plants is from $491 to $577 per carload storage capacity, on the basis of each car containing 756 boxes of apples. From this it is apparent that the investment in cold storage in the Yakima Valley runs into rather large figures, probably exceeding $3,800,000.

The cooperative association is a natural agency for interpreting and distributing the information that will aid its members to adjust production to probable demand.



A fine first crop of wheat growing on Tule Lake bed lands, Klamath project, Oregon-California

Contract Between United States and Greenfields Irrigation District

THE United States has been engaged for several years in the construction of the Sun River project, Montana. The Greenfields irrigation district comprises a portion of the area of the project. The United States had expended up to December 31, 1925, the sum of $4,028,514 for the benefit of the district lands. This amount had provided only a partial water supply for the district lands, storage water being needed to supplement the natural stream flow made available by this expenditure. Also additional canals and other structures were needed to complete the irrigation plant for the district.

REPAYMENT PROVISIONS

It had been determined by reconnaissance surveys that a satisfactory location for a reservoir exists at what is now called the Gibson Dam site in Sun River Canyon. Water-supply studies had shown that the water supply at that point was sufficient to warrant the construction of a reservoir. Congress appropriated money for the initiation of the construction, and a contract dated June 22, 1926, was then made with the Greenfields irrigation district by which the district agreed to repay (*a*) the expenditure of $4,028,514 above referred to; (*b*) the amount, to be determined by the Secretary of the Interior, expended by the United States between December 31, 1925, and January 1, 1926, for the benefit of the district land; and (*c*) the amount to be expended for the benefit of the district in 1926 and later, but not exceeding $5,471,486. "Said maximum sum" (the quotation is from article 5 of the contract) "shall be expended in the construction of storage works in the Sun River Canyon, in the enlargement of the main canal supplying district lands, in the building of a distribution system for additional district lands not at the present time irrigable from constructed works, and in the construction of additional drainage facilities, or so much of said works as, in the opinion of the Secretary, is necessary and advisable."

The contract provides for the repayment by the district of the total construction cost. If the irrigation system is completed for a portion of the area of the district before the entire district irrigation plant is completed, the Secretary is authorized to require the district to begin the payment of construction charges from the completed portion of the project and to fix a provisional construction charge for such part of the project, which provisional charge is to be adjusted later when the cost of the entire project is ascertained. The completion of the construction program is contingent upon Congress making the necessary appropriations, but if work is discontinued before the entire program is finished, the district is to make payment in 40 years of the amount expended by the United States up to the date of completion. Payment of the construction charges on the completed project or on any completed part of the project is to be made under the terms fixed by subsection F of section 4 of the act of Congress of December 5, 1924 (43 Stat. 672); that is, payments will be proportioned to the gross crop returns upon the land from which the charges are being collected, 5 per cent of the gross crop return being payable annually.

The Secretary will announce to the district the amount payable by the district each year, and the district is to levy assessments so that the full amount will be paid to the United States on the respective due dates without deduction on account of the failure of some of the landowners to pay their taxes before same become delinquent. In other words, the district assumes what the water users are accustomed to refer to as "joint liability."

OPERATION OF WORKS

During the construction period the works necessary for irrigating the lands of the district are to be operated and maintained by the United States and water will be delivered upon temporary rental applications requiring payment in advance. However, if the irrigation system is completed for any portion of the project before the works as a whole are built, the Secretary is empowered to turn over to the district the duty of operating a part of the irrigation plant. Immediately upon the termination of the construction program the Secretary will give notice thereof to the district, and the district is thereupon to assume the duty and expense of operating and maintaining the works necessary for irrigating the district lands.

During the period while the construction charges are being paid the manager or superintendent employed by the district is to be and remain satisfactory to the United States, the Secretary being empowered to call upon the district to discharge any manager or superintendent found by the United States to be unsatisfactory.

The United States reserves the right to inspect the transferred works so as to ascertain whether they are being properly cared for. The cost of such inspection is to be paid by the district. The district agrees to make any repairs called for by such inspection, and if it fails to do so, water may be shut off until the repairs are made, or the United States may take back the care of the transferred works, or itself make the repairs and charge the cost to the district.

REFUSAL OF WATER ON DEFAULT

Article 19 of the contract, because of its importance, is quoted in full:

"19. *Refusal of water in case of default.*—The United States reserves the right to refuse to deliver water or to continue to deliver water to the district

Pure bred dairy cattle on the Sun River project, Montana

in the event of default for a period of more than one year in any payment due the United States from the district, and for that purpose may take over the control of the headworks and diversion works of said canal system and regulate the same. Instead of refusing delivery of water to the district, the United States may, at its option, reduce the amount of water delivered, and in the event of the operation and control of said headworks and diversion works by the United States for the purposes aforesaid, the district will pay to the United States each year, the cost of said operation and control. The district shall refuse water service to all lands which may be in default for more than one year in the payment of any construction or operation and maintenance charge of the district. The provisions of this article are not exclusive, and shall not in any manner hinder the United States from exercising any other remedy to enforce collection of any amount due hereunder."

When the district has completed payment of the construction charges, the United States is to quitclaim to the district all of the interest of the United States in the Greenfields division of the Sun River project, together with appurtenant water rights, except that the reservoirs are to be retained by the United States until otherwise provided by Congress.

The execution of the contract was authorized, as required by the Montana law, by a petition of the landowners in the district, and the contract was confirmed by the Montana courts.

Cement lined canal on the Newlands project, Nevada

Turkeys Bring $10,000 To Sunnyside Farmers

Twenty-two hundred turkeys made up a car lot shipped to Tacoma recently from the Sunnyside division of the Yakima project, Washington. This is the first car lot of the holiday birds ever billed from the Sunnyside division, and represented $10,000 paid to the growers. The price was 45 cents a pound.

Climatic conditions in the Yakima Valley are favorable for turkey raising, and there is a tendency toward an increase in the number every year. There is a good demand for poultry of all kinds grown on the project. According to the 1926 crop report poultry on the project numbered 193,360. This is an excellent showing, but there is room for a large increase.

Part of E. Murray's flock of egg producers, Belle Fourche project, South Dakota

Australian Reservoir Has Largest Capacity

Construction is in progress on the Nathan Reservoir, Queensland, Australia, which on completion will have a capacity of 2,485,000 acre-feet at the spillway crest, and by means of 5 feet of shuttering will impound an additional 514,100 acre-feet, bringing the total possible storage for irrigation purposes to 2,999,393 acre-feet.

The capacity of the Elephant Butte Reservoir on the Rio Grande project, New Mexico-Texas, is 2,638,000 acre-feet at the spillway crest. Present plans for the proposed Boulder Canyon Dam on the Colorado River provide for a reservoir with a capacity of 26,000,000 acre-feet.

The primary purpose of a farmers' cooperative association is to conduct business activities incident to the marketing of the commodities produced by its members. All other plans and aims must be secondary.

Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

Tree Planting

WE are pleased to note that some of the project newspapers are printing articles advocating the planting of trees.

Here is an item from the January issue of the Churchill County Eagle, of Fallon, Nev. (Newlands project):

"Why Not Plant Trees in Favorable Odd Nooks and Corners on Project Farms

"While the Government is having a great deal to say in its forest reserve propaganda about reforestation, and this is a good thing, we wonder if there are not a good many nooks and corners on Newlands project farms that might be utilized for growing cottonwood, poplar, or other trees that would come in handy for fire wood a few years later.

"It does not take a cottonwood long to attain pretty good size in the Lahontan Valley and many farmers now secure their fire wood from the trimmings of trees and the thinning out here and there.

"Besides the fuel question, a clump of trees here and there add wonderfully to the appearance of the farm, make shelter for the stock and enhance the value of the farm as well as contributing to the beauty and attractiveness of the community."

We hope other project papers will pick up the good work of urging the planting of trees; that is the sole purpose of the articles appearing in the ERA on this subject.

Helpful Suggestions

There is always a right and wrong way to accomplish anything. So-called short cuts are not always the right way, although, usually, the right way saves time in the end.

Doing things in the right way becomes a habit, saves time and, therefore, tends to efficiency. I am sure there are many of us who have seen friends in our circle employ better methods in everyday tasks which we have been glad to use as an example, or probably we have found an easier and better way of doing these tasks and have been pleased to pass on our experiences to others.

How many times have you heard the inexperienced housekeeper confide the fact that everything in housekeeping seems easy compared with laundering and folding a shirt, and yet this is one of the tasks that requires no particular skill.

How to Fold a Shirt

When correctly folded, the shirt will retain its smooth, trim appearance after being put away with others in a drawer or on a shelf, and it can be packed for traveling with equal certainty that when taken out it will be fresh-looking.

Reclamation Bureau Gets Medal of Honor

At the close of the Sesquicentennial Exposition at Philadelphia, the Bureau of Reclamation was awarded the medal of honor for its exhibit. The awards to the department and bureaus were as follows: Grand prize: Department of the Interior. Medal of honor: Bureau of Reclamation, Bureau of Education, and Office of Indian Affairs. Gold medal: General Land Office, Geological Survey, National Park Service, and Alaskan Railroad. Silver medal: Bureau of Pensions.

The exhibit of the Bureau of Reclamation was simple but very effective, comprising a 7 by 9 foot model of an irrigated farm with a background of a number of colored enlarged photographs of project scenes, maps, and diagrams.

Waists and dresses that are simply made can be folded in much the same way when necessary, but a better plan is to put them on hangers as soon as they are ironed, and store them in a closet that has a central pole for the purpose. All articles should be folded as little as possible, but this depends, of course, on the space available for storing them.

In general, fold pieces lengthwise in the direction of the warp and then very lightly crosswise until a convenient size is reached.

To fold a shirt or blouse, button it down the front and then lay it front side down on a table or board, making sure there are no wrinkles. The first folds are then made lengthwise, in such a way that the whole center front for about 5 inches each side of the middle will be kept smooth. The sleeves, by means of diagonal folds, are brought straight down the back lengthwise. Parts of the two sleeves will overlap. In the case of a shirt there will be an end beyond the sleeves. This is turned back over the cuffs, and the shirt is folded across once more, leaving the front on the outside.

A little practice soon makes one adept at folding shirts so that they will all be the same size when finished and fit in the same drawer or box.

Laundries usually lay an oblong of cardboard of the desired width down the back before folding is begun, and fit the folds over that. If a few of these laundry cardboards are saved the home laundress can do the same thing. This extra protection from wrinkles is chiefly desirable if shirts are to be packed for traveling.

Laundry Problems With Hard Water

If every home could have an abundance of perfectly pure water the home laundry problem would be greatly simplified. However, as found in its natural state water always contains more or less dissolved and suspended material.

Distillation is the best method of rendering water that is excessively alkaline, acid, or salty fit for use, but it is impractical in the home. Filtration and softening by means of boiling or by the addition of chemicals are the usual methods used in the household. The use of washing soda is an inexpensive method of treating hard water. One pound of soda is dissolved in 1 quart of water, and 2 tablespoons of this solution used for each gallon of water. Other chemicals may also be used. The greatest difficulty in using them is determining the quantity required by the degree of hardness of the water. This information can usually be obtained from the nearest water laboratory and if the trouble experienced is a permanent condition, it will be worth while to have a sample analyzed. Detailed information about treating hard and other waters to make them satisfactory for laundry purposes are given in a new bulletin on home laundering recently issued by the United States Department of Agriculture.

About 40 per cent of the average value of all the farm family's living is represented by food, one-third of which is purchased.

Malnutrition in Spite of Plenty

The necessity for selecting the right food for children, and even for grown-ups, is being emphasized because in the midst of plenty, thousands are not getting the foods they need for the highest development of mind and body. The United States has more food and better food than any other nation. Our pure food laws and sanitary methods of handling food supplies are world famous. Along with our efforts to safeguard health through food control, however, we need to develop better food habits and so reduce our alarmingly high percentage of malnutrition.

An undernourished child does not have a fair start, and everything is harder for him. Even though his body may outgrow some of the visible signs of malnutrition others not so apparent remain. His resistence is likely to be lowered so that he "catches" diseases easily. Faulty mental habits cling and in countless other ways he carries a handicap all through life.

Research into the science of keeping well goes on but has not dictated the proportion of efficiency nor assumed the strides of progress enjoyed in other sciences.

Efforts toward the perfection of the body as an efficient working and thinking machine must of necessity be confined to improvements in its motive power; and since this is generated from the foods we eat, the remedy narrows down chiefly to what food we shall eat and how and when we shall eat it.

Building up the reserve by proper dietetic habits will make the individual practically immune to acute diseases. This means muscular and mental efficiency.

Give more thought to this all-important subject of fuel for the system and you will enjoy good health; while you are cutting out sickness you are laying a good foundation for this strenuous world's work and you are at the same time decreasing your doctor's and druggist's bills.

This takes on an economic aspect and has another important phase; those foods which are most conducive to efficiency and immunity to disease are the cheapest.

A suggested bill of fare, yielding 1,440 calories follows:

Tomato soup.	Bread.
Potatoes (white or sweet).	Butter.
Baked cauliflower.	Ripe olives.
Lima beans.	Pumpkin pie.
Spinach.	Cocoa.
Macaroni with cheese.	Walnuts.

Meets specifications in not being too fussy

This is equal in point of variety and palatableness to the more elaborate dinner, satisfies the appetite, and is more economical than the one which includes expensive cuts of meats, fritters, and indigestible foods of this kind.

The Boy's Room

In the last issue of the ERA we carried a short article and a photograph of "The Girl's Room." Let us not forget another important adjunct of the home—"the boy."

A boy likes a room of his own, where he can bring other boys if he wishes. Straight lines, strong colors, durable materials, and few furnishings are desirable in such a room.

A boy won't want curtains with ruffles, pastel colors, or vague patterns. He prefers such materials as burlap, crash, denim, or sateen, in strong green, brown, blue, or orange colors. These materials can be hung from a painted pole without a valance. Vigorous patterned cretonne should please him.

The illustration shows a young boy's room. The curtains are of gray gingham with colorful cretonne appliqués. They match the couch cover. The material can be washed without losing its color, and it is simple enough to answer the boy's requirement that nothing in his room be "fussy." Many other satisfactory color combinations and materials could have been used.

The Forestry Council of Chautauqua County, New York, composed of representatives of all organizations in the county, has pledged itself to plant a half million trees in the county during the coming year.

Outline of the Growth and Future of the Cooperative Movement

On the Government reclamation projects the farmer learns by actual demonstration that what may be impossible to attain by an individual may be procured by an organization for the benefit of every individual

By Benjamin Brown, President, Utah Poultry Producers Cooperative Association

COOPERATION or the cooperative movement is not new. Traces of it can be found even among animals who cooperate for the purpose of attack or protection from common enemies. Even wolves cooperate, forming packs in search of food. Early gatherings among men, first in families then into clans, tribes, etc., were in a sense voluntary cooperatives prompted by individual necessity. All through ancient and medieval history we find outbursts of cooperation as a means for the alleviation of some social ills. We also find cooperation in the early stages of our modern history. We find cooperation in the seventeenth century among European peasants forming cheese-making circles, which developed later into fairly good commodity marketing organizations. Those early European cooperative groups were the forerunners of the later idealogical advocators for a world-wide cooperative movement as expressed by Robert Owen in his maxim, "The shop for the workers," etc. In the United States we have records of farmers' associations as early as 1825. Here in America the cooperative movement gained great impetus, under the leadership of Oliver Kelly in the early seventies of the last century, and with the appearance of the Rochdale Co-ops in England it seemed for a time as if the millennium was to be ushered in by a new redeemer riding on a White Horse called "Cooperation."

Strong and beautiful was that youthful rider. Dressed in a garb of peaceful blue, decorated with stainless white, guarded by the advance of justice and fair play to all, he made his way through the thickets of human selfishness and greed. But just as he was coming out of the thickets in one dark hour before dawn, during one of the desperate moments of doubt in his own strength, the bewitching coquette of party politics found our youthful cooperative captain and promising him a heaven of vanity, besmeared his clean garb with the stain of the party politician. Then, strangled under the weight of personal ambition, he fell into the gutter of momentary reward. Thus, the heroic rider on the White Horse, the cooperative movement of the last century, disappeared from our view until only recently his rejuvenated spirit, bathed and cleansed in the sorrows of the World War, made his reappearance again, revealing himself by reflection through the recent renewed cooperative movement the world over.

POSTWAR PROGRESS

Before we go further it may be well to note down several facts and figures concerning this postwar cooperative movement. We find here in America where radical ideas usually travel slowly, that since 1922 when the American Farm Bureau Federation was formally established, the cooperative farm movement made enormous strides; 12,500 Co-ops, according to recent reports, had a turnover last year of two and one-half billion dollars. Also, whether the cooperative advocators care to be called radical or not, the fact is that the leaders of the cooperative movement in America are striving to establish conditions here similar to those in the little country of Denmark. In other words, the cooperative farm movement in this country has for its goal the object to eliminate any and all nonproductive elements from the present economic system. Again, it is an open secret that the farmers cooperative movement does not intend to stop with cooperative marketing alone, but seeks to derive similar benefits also through cooperative buying and distributing.

COMING CHANGE IN ECONOMIC STATUS

Now, assuming that the above two features of the American cooperative movement; that is, cooperative marketing and cooperative buying, would become established facts with the majority of the American farmers, I can venture to predict a change all along the entire line of our present social and economic status.

First, because the above outline would naturally be followed by a federation of producer cooperatives of the same commodity. Second, this would most likely lead to the establishment of joint selling or distributing agencies for such federated cooperatives in the main distributing central markets. Third, the shipment of commodities to such central markets would be regulated by a central board of the federated organizations. This would mean an indirect price regulation for all markets alike on the same commodity, and if the above method of procedure was followed out for all food supplies and a raw material, which are produced by the various farmers' organizations, it would lead to an equal cost of living in all cities of the country.

Fourth, also, because of the great organized cooperative purchasing power by this same federated farmers' organizations who would do cooperative buying on a large scale for their constituent organizations, there would be a less chance for some ambitious workers to become small manufacturers for themselves by trying to sell their wares to some country merchants who deal with farmers.

OPPORTUNITY FOR COOPERATION ON PROJECTS

In conclusion, I want to say that the most effective schools for cooperation in America are the Government reclamation projects. Here the farmer learns by actual demonstration that what may be impossible to attain by an individual may be procured by an organization for the benefit of every individual. It is obvious that no individual can afford to build a reservoir and canal system for the purpose of irrigating his own farm. The United States Government, in building irrigation projects, not only supplies funds at a nominal rate of interest, but as I understand it, every individual is limited to a certain acreage under the project. In other words, no land and water speculation is permitted and every one pays the same amount per share, no matter how many shares he may want. There are no favorites under such projects. Again, the water users, under such projects, learn their first lessons of cooperation by submitting to the water master to divide the water among them as per their holdings of such water rights. They also learn the benefits of cooperative ownership of ditches and laterals, and of implements necessary for the cleansing and building of ditches and laterals, etc.

I know from personal experience on the Piute Reservoir project in Utah that it is much easier to explain the benefits of cooperation to a group of settlers on an irrigation project than to any other group of farmers. Here such farmers come in close and direct contact with technically trained Government officials, such as irrigation engineers and their assistants. The farmers usually listen to those men when they talk cooperation to them because they feel that inasmuch as the United States Government is in full accord with the cooperative idea it must be sound and it must be suited to American conditions because the cooperative plan fits the American principle of fairness to all and special privilege to none.

When Irrigation Was Young

Our readers will be interested in this article by a student of the history of irrigation and its relation to ancient civilizations—Many problems found to be similar to those on our irrigation projects to-day

By George O. Sanford, Superintendent, Sun River Project, Mont.

MONTANA has been struggling with irrigation for something over two generations. The area now under the ditch is about 2,000,000 acres and the chief problem now confronting irrigation development is first to complete the projects that have been started and then secure the settlers who will bring these farms up to the highest possible state of cultivation.

Possibly you may think that we are trying to travel an unblazed trail in this irrigation work, but if you do think so you are mistaken for irrigation is one of the oldest arts practiced by the human race. In fact, the world was cradled under the ditch and the oldest known civilization was developed in countries where irrigation was necesasry for the production of crops. Egypt was blessed with the annual overflow of the Nile, and because of this flood irrigation, supplemented by water stored in pools at the time the river was high, wonderful crops were produced. Herodotus tells us that the Egyptians—

Obtain the fruits of the field with less trouble than any other people in the world, since they have no need to break up the ground with the plough, nor to use the hoe, nor to do any of the work which the rest of mankind find necessary if they are to get a crop; but the husbandman waits till the river has, of its own accord, spread itself over the fields and withdrawn again to its bed, and then sows his plot of ground, after which he has only to await the harvest.

Good crops brought about a rapid increase in the population and a mighty nation grew up on the banks of the Nile which subjugated the adjoining nations and tribes and brought the captives back to till the soil and perform the hard tasks for their conquerors.

The Bible has frequent references to irrigation, and we read in Deuteronomy xi, 10, 11—

For the land, whither thou goest in to possess it, is not as the land of Egypt, from whence ye came out, where thou sowedst the seed, and wateredst it with thy foot, as a garden of herbs:

But the land, whither ye go to possess it, is a land of hills and valleys, and drinketh water of the rain of heaven.

It is self-evident that the promised land that Moses was talking about was a land where crops could be raised without irrigation, but one well may ask what is meant by watering the ground "with thy foot" for it certainly sounds like a queer way to irrigate. In those countries the irrigation shovel was not a common tool, at least not as common as it is on the farms in this country and we have a right to assume that it was unknown in the time of Moses. The irrigation farmer in those days went barefoot, and when he wanted to turn the water from one plot into another, or from his farm ditch, what better way than to break down the bank with the foot and thus turn the water on to a new part of the farm? This same method is in use to-day just as it was several thousand years ago.

Babylon was the center of a large irrigated area, and we know from what little remains to-day that ages ago the country must have been covered with a network of canals.

One naturally wonders if there were engineers in those days who designed the canals and determined what the fall per mile should be and how much water each landowner was entitled to have. This we do know, that their canal systems were an important factor in the life of the nation and laws have been found which in some respects are in advance of the irrigation code of Montana. King Hammurabi ruled over Babylon about 4,000 years ago and he left inscribed on a large diorite bowlder what is known as the code of Hammurabi the Just. These laws cover a great many subjects and among them is that of irrigation; and after reading them we draw the conclusion that the same troubles existed in those days that are found on all, or nearly all, of our projects at the present time. Here are some sections of his irrigation code:

If anyone is too lazy to keep his dikes in order and fails to do so, and if a breach is made in his dike and the fields have been flooded with water, the man in whose dike the breach was opened shall replace the grain which he has destroyed.

If he is not able to replace the grain he and his property shall be sold, and the people whose grain the water carried off shall share the proceeds.

If anyone opens his irrigation canals to let in water, but is careless and the water floods the field of his neighbor, he shall measure out grain to the latter in proportion to the yield of the neighboring field.

There can be no doubt that these laws were very effective in preventing carelessness in handling water, and some of us can recall the time when similar laws would have had a very good influence in eliminating troubles on our present-day projects, although our ideas of right and justice would hardly permit the sale of a man to make good the destruction of crops.

It is evident that a king in those days had a good many affairs to which he had to give his personal attention and among others it seems that operation and maintenance work came under his supervision for we find letters written 40 centuries ago that read a good deal like the instructions of to-day. Letter writing in those days was quite an art, and, although it required a much longer time than it does to-day, the writings are still in perfect condition, which is something that may not be true of our letters 4,000 years hence. Clay cylinders were prepared on which were inscribed the cuneiform characters and then baked. The translation of these letters makes some very interesting reading. Here is one that Hammurabi wrote to one of his subordinates—possibly a superintendent in charge of some division of a project:

To Sin-Idinnam: Thus saith Hammurabi.

The whole canal was dug but it was not dug clear into Erech, so that water does not come into the city. Also the bank of the Duru Canal has fallen in. This labor is not too much for the people at thy command to do in three days. Directly upon receipt of this writing dig the canal with all the people at thy command clear into the city of Erech, within three days. As soon as thou hast dug the canal do the work which I have commanded thee.

In the art of letter writing we must admit that Hammurabi ranks high if the above quotation is a sample of his work. It is brief and to the point and there is a sound to it that does not permit any argument. It's a safe bet that the job in question was finished in three days.

The ancient records that have thus far been brought to light show that Hammurabi placed great importance on irrigation in connection with the economic life of his kingdom. One of the inscriptions reads as follows:

I have made the canal of Hammurabi, a blessing for the people of Shumer and Accad. I have made water flow in the dry channels and have given an unfailing supply to the people. I have changed desert plains into well-watered land. I have given them fertility and plenty, and made them the abode of happiness.

It will have to be admitted that this is a pretty good record and one of which a man, or even a king, may well be proud. And these few lines cover in a very thorough manner the objects to be obtained on any irrigation project; the establishment of homes where people can live in peace, prosperity, and happiness. Irrigation still has the same troubles that existed centuries ago. In those days it was a one-man proposition and from his decision there was no appeal. To-day these things must be considered and decided so as to give justice to all and the greatest good to the greatest number. The irrigation community must be a cooperative community if the best results are to be secured and that holds true from the operation of the canal system through the several operations to the disposal of the crop. "No man liveth unto himself alone." This thought is especially true on an irrigation project.

Cooperative organizations vary in type in accordance with marketing services performed, characteristics of the commodity handled, character of the trade with which they must articulate, extent and nature of the territory over which the association operates, and financial and social status of the members.

Board of Examiners On Huntley Project

The Secretary has designated the following as members of a board to examine applicants for entry to public lands on the Huntley project, Montana:

H. M. Schilling, superintendent, Bureau of Reclamation, Ballantine, Mont.

J. Homer Hancock, secretary, Huntley project irrigation district, Ballantine, Mont.

Gregory J. Powell, president, Huntley project development association, Ballantine, Mont.

Seed Potatoes Should Be Used Liberally

The importance of using a liberal quantity of seed potatoes is not generally recognized by commercial potato growers. The recent accomplishment of a firm of California potato growers in producing 1,038.3 bushels of potatoes on a measured acre and an average yield of 1,001 bushels on 9 acres would not have been possible if only the usual quantity of seed had been planted. These growers consider the liberal use of seed a good investment. In the production of their phenomenal yield seed potatoes were planted at the rate of 40 bushels per acre or more than twice the quantity used by our most progressive potato growers.

Experimental results indicate there is a close correlation between the quantity of seed used and the yield per acre. Planting large-size sets insures a better germination and a larger set of tubers; therefore it is a desirable practice provided the resultant plants have an abundant supply of plant food and moisture. Large-size sets mean more stems and tubers per set; consequently more nourishment is needed to develop these tubers to market size.

TWO cars of dressed turkeys were shipped in December from the Garland division of the Shoshone project. The price paid was the highest in the history of the project and brought returns amounting to about $30,000.

THE Powell Creamery, Shoshone project, purchased during December, 12,500 pounds of butterfat, and manufactured 15,000 pounds of butter and 100 gallons of ice cream. Other agencies purchased 4,700 pounds, shipping to outside creameries. The Frannie division shipped 7,600 pounds of cream, of which 3,200 pounds went to the Powell Creamery.

Orchards on the Okanogan project, Washington

Cotton Growing on the Orland Project

By R. C. E. Weber, Superintendent

COTTON was first raised on the Orland project during 1918, at which time two experimental plots of 10 acres each were planted. The results as to yield were fairly satisfactory, but no further attempt was made in cotton culture unti 1925, when 64 acres were devoted to this crop on the project.

Upon the recommendation of the United States Department of Agriculture, based on observations and experiments during previous years in the San Joaquin Valley of California, the Acala variety was planted at Orland. The yields derived have proven the wisdom of the recommendation of specializing in this variety for the Orland project as well as for the Sacramento Valley in general. The Acala variety is a "short-staple" cotton with a fiber of 1⅛ to 1 3/16 inches in length. The results of the plantings for 1925 were so uniformly satisfactory that the acreage expanded to 279 during the past season.

Results for the past season and for 1925 indicate about the same yield per acre. Much lower prices, however, for 1926 resulted in a reduced crop value per acre. The large variation in price to which the product is subject casts considerable doubt on its being ranked as a staple product of the project.

On the 64 acres cropped during 1925, there were produced 50 bales of cotton, representing an acreage yield of 0.78 bales per acre, which at $112.50 per 500-pound bale, resulted in a total crop value of $5,625, or $87.90 per acre. During the present year 225 bales were raised on 279 acres. This represents an average yield of 0.81 bale per acre, a slight increase over the yield for last year. Opposed to the 1925 price of $112.50, however, was the early offering last fall of only $67.50 per bale, nearly a 50 per cent reduction. Based on the above price of $67.50 per 500-pound bale, last season's crop is valued at $15,187, representing an average return of $54.43 per acre.

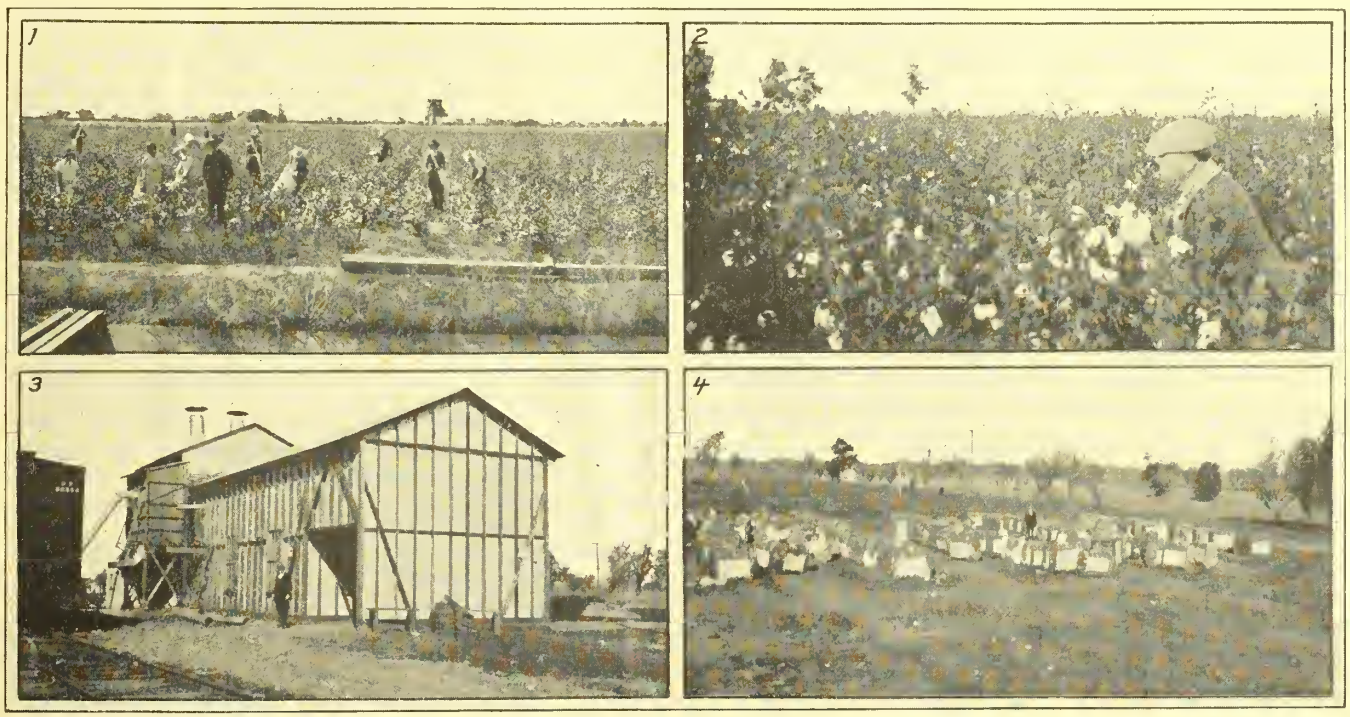
Cotton is planted in April and during the early part of May. A moist seed bed, usually obtained by irrigation, is desirable. The seed is drilled in rows about 3½ feet apart to permit ready cultivation during the growing season. About four irrigations (exclusive of that for preparing the seed bed) were required during last year to mature the plant. Land properly prepared for irrigation so that the water supply can be uniformly applied is essential for the best results in raising cotton. Picking began during the latter part of September and most of the crop was harvested at the close of October. A small amount was in the field for picking during November.

A number of items of expense are involved in cotton culture. In addition to the cost of planting, irrigating, and cultivating, there are expenditures for picking and ginning. Picking costs from 1½ to 2 cents per pound (unginned cotton). This results in 4½ to 6 cents per pound for the ginned product. Ginning, together with charges for ties and baling, amounts to 1½ cents per pound (ginned cotton), which, however, is slightly more than compensated for by the value of cottonseed. Farmers were paid about $1.12 per hundredweight for the seed at the gin. The ratio of seed to ginned cotton by weight is about 2 to 1, the percentages being 62 and 38, respectively, of the raw product.

In 1925 it was necessary for the Orland cotton growers to take their product to Maxwell (33 miles distant) for ginning. Last year, however, a gin was operating at Hamilton City, 12 miles east of Orland.

The cotton produced on the project is sold by the farmers to buyers who consign the product to market. No effort has yet been made by the local growers to organize and operate a cooperative marketing organization for disposing of the product.

Crop rotation is a farm practice which may be used by the farmer to increase the productivity of his soils as effectively as by the use of manure or commercial fertilizers.



1. Picking cotton. 2. Cotton raised on the project. 3. Cotton gin at Hamilton, near the project. 4. Ginned and baled cotton.

Organization Activities and Project Visitors

DR. ELWOOD MEAD, Commissioner of Reclamation, spent several days recently in southern Florida considering opportunities for planned group settlement in that State.

R. F. Walter, chief engineer, arrived at the Washington office early in January for a stay of several weeks in connection with appropriations and the construction program.

B. E. Hayden, reclamation economist, will be in the Washington office for a month or two assisting in the preparation of booklets advertising the Belle Fourche, Lower Yellowstone, Riverton, Shoshone, Klamath, and Orland projects.

The representatives of the Interior Department and of private interests, appointed by the Secretary and comprising R. S. Carbery, L. M. Holt, of the Indian Bureau, and P. J. Preston, superintendent of the Yuma project, after completing a three months' field investigation of private and Government projects, was in the Denver office practically the entire month of December, compiling a report on operation and maintenance methods and costs.

Mary Christian, assistant clerk in the Denver office, has been transferred to the office of the Federal prohibition agent at St. Louis, Mo. Grace Miller has been appointed to succeed Miss Christian by reinstatement and transfer from the National Park Service.

Messrs. Howard Elliott, Daniel C. Roper, and George Soule, special advisers on reclamation and rural development, visited Wilmington, N. C., recently to inspect the group settlement on the property of Hugh MacRae. The report of the special advisers covering their trip in December through the South to study opportunities for planned rural development will be submitted shortly to the Secretary.

Roland Harwell, manager El Paso County water improvement district No. 1; J. W. Taylor, president and manager, Elephant Butte irrigation district; and Maj. R. F. Burges, attorney for the two districts, were recent visitors at the Washington office to confer concerning a possible revision of the present contract with these districts on the Rio Grande project.

Recent visitors to the Yuma project were Governor George H. Dern, Dr. John A. Widtsoe, William R. Wallace, and Oliver J. Grimes, of Utah, accompanied by the board of directors of the Imperial irrigation district.

Lorenzo Lepori, civil engineer from the Argentine Republic, spent two days on the Orland project inspecting the irrigation works at Orland and East Park, and the construction at Stony Gorge.

W. G. Steward, formerly with the Bureau of Reclamation and now hydraulic engineer with the Twin Falls Canal Co., Idaho, spent two days on the Minidoka project to obtain information on ground-water conditions.

District Counsel Roddis was in Great Falls during December, in company with Superintendent Sanford of the Sun River project, for a conference in connection with land purchases in Gibson Reservoir and matters relating to the hearing on the confirmation of the execution of the contract by the Fort Shaw irrigation district.

Recent visitors at Guernsey Dam, North Platte project, included William Ernst, chemist of the South Dakota Cement Commission; O. H. Cox, of the Bureau of Standards; and H. M. Lawler, of the Utah Construction Co.

After finishing his assignment on the investigation of Spanish Springs, A. W. Walker returned to the Newlands project to assume charge of drainage work.

L. E. Foster, superintendent of the Carlsbad project and Assistant Engineer J. R. Yates spent several days at Las Vegas attending the hearing of the Pecos River adjudication suit.

R. S. Besse, farm management specialist of the Oregon Agricultural College, was on the Klamath project recently collecting statistics on crop yields and values for lands in the main division. The information obtained will be one of the items in the agricultural survey of Klamath County, which is now in progress under the supervision of the college.

E. Stacey, locating engineer for the Oregon Short Line Railroad, was a recent visitor on the Owyhee project.

D. B. Pratt, field manager of the Utah-Idaho Sugar Co., was on the Belle Fourche project the greater part of December in connection with plans for the construction of a sugar factory.

Ed. Makeben, of the Squire-Dingee Pickle Co., made a recent visit to the Belle Fourche project to inspect the salting stations and make plans for an extension of the industry.

L. E. Mayhall, general superintendent of hatcheries for the State of Washington, and J. M. Mayhall visited the Kittitas division of the Yakima project to discuss the matter of fishway provision in the design of the proposed dam at Easton.

Clifford L. Tice, reservoir superintendent at Tieton Dam, Yakima project, has been transferred to a similar position at McKay Dam, Umatilla project.

Associate Engineer J. R. Iakisch was on the Shoshone project for several days in connection with the Garland division drainage matters, coming from the Vale project, Oregon, and going to the Denver office.

Kirk Bryan, geologist, United States Geological Survey, arrived at Carlsbad on January 24 to make the geologic examination of the Avalon Reservoir site.

Ottamer Hamele has resigned as counsel in the Bureau of Reclamation to take a position on the trial staff of the general counsel of the Bureau of Internal Revenue.

A cooperative association is not a profit-making institution, but rather a service institution through which the producers seek to control in varying degrees the processes involved in the distribution of the products produced on their farms.

The successful operation of a cooperative association over a period of years is dependent upon members who support their organization with an adequate supply of products.

WASHINGTON: GOVERNMENT PRINTING OFFICE: 1927

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards,** Assistant Secretary; **E. O. Patterson,** Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary; **J. H. McNeely,** Assistant to the Secretary; **W. B. Acker,** Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — George C. Kreutzer, Director of Reclamation Economics — P. W. Dent, Assistant to the Commissioner

W. F. Kuhach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	
Carlshad	Carlshad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	D. S. Stuver	G. B. Snow	Miss E.M.Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr	H. W. Bashore	L. H. Mong	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	American Falls, Idaho	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [9]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Boise, Idaho	R. J. Newell			B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	M. J. Gorman	E. M. Philebaum	R. J. Coffey	Berkeley, Calif

Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks [10]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [10]	Chas. Klingman	L. J. Windle	Wm. J Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [11]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam	Augusta, Mont	Ralph Lowry [11]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [11]	C. B. Funk		R J. Coffey	Berkeley, Calif.

[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on April 1, 1926.
[2] Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1926.
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.
[9] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.
[10] Resident engineer.
[11] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise	Boise, Idaho	R. J. Newell	
Middle Rio Grande	Denver, Colo	I. E. Houk	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.
Yakima project extensions	Yakima, Wash	J. L. Lytel	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.

An irrigation scene on the Uncompahgre project, Colorado

I 27.5: 1927

Clemson College Library

NEW RECLAMATION ERA

VOL. 18 MARCH, 1927 NO. 3

AN IRRIGATED APPLE ORCHARD ON THE OKANOGAN PROJECT, WASHINGTON

IN speaking of the business operations of the Federal Government we are not greatly concerned with the amount of responsibility attaching to an office. Rather are we concerned with the manner in which that responsibility is discharged. It is in the discharge of our duties that we find success or failure. In the vast business of the Federal Government we must necessarily measure the product in the aggregate. This aggregate is the sum total of all of our efforts. No matter how high or how low the position held, each of us in the Federal service contributes to the aggregate of the product. We are often charged with inefficiency. But I am fully convinced that the facts demonstrate that, measuring efficiency by the aggregate of the product these last years, there is no business body more efficient than the business organization of the Federal Government.

—*From the address of the President of the United States at the Twelfth Regular Meeting of the Business Organization of the Government, January 29, 1927.*

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 MARCH, 1927 No. 3

Interesting High Lights on the Reclamation Projects

THE Colorado River discharge at Yuma during January was about 48 per cent of the 24-year average. Cold weather in the upper watershed held the discharge below 7,000 second-feet during the month.

AVERAGE returns from heavy shipments of lettuce from the Yuma project, less the crates, were about $1.10 a crate, bringing the growers about 40 cents. The average yield was about 200 crates an acre.

EXCAVATION for the abutments of the Stony Gorge Dam, Orland project, was carried on actively during January. One cableway had been installed and was ready for operation, and works had started on panel forms for the dam and in the installation of the gravel and concrete plant.

THE Orland Orange Growers Association have packed and shipped 25 cars of oranges during the current season. The results of the season's operations will be highly remunerative to the growers, indicating a bright future for this industry on the project.

THE sixth annual show of the Western Colorado Poultry Association was held recently at Delta, Uncompahgre project. Approximately 600 birds, valued at $5,000, were exhibited.

THE Montana State Corn Show and the Montana Utility Seed Show held recently at Sidney, Lower Yellowstone project, gave the water users an excellent opportunity to see the best products in these lines produced in the State and to hear a number of instructive talks. Several water users received high awards on their entries.

THE State Poultry Show held recently in Caldwell, Boise project, gave evidence of increased interest in this industry on the project. The Caldwell hatchery will operate on an enlarged scale and others are being started.

Project Crops Worth $60,000,000 in 1926

Crops valued at more than $60,000,000 were grown last year on the Federal irrigation projects under the Bureau of Reclamation.

According to advance figures prepared by the bureau, 1,409,932 acres were irrigated on 24 irrigation projects. Of this area, which included land in young alfalfa and in nonbearing orchards, 1,311,405 acres were cropped, producing crops having a gross value of $60,331,245, or $46 per acre.

In contrast to this figure of $46 per acre on the Federal irrigation projects it is interesting to note that the average value per acre in 1926 of 10 principal crops, comprising nearly 90 per cent of the area in all field crops for the United States as a whole, is estimated by the Department of Agriculture at $19.07.

FIVE additional applications have been received for farm units on the Riverton project, and six applicants visited the project during January. Three applicants were accepted by the examining board.

THE Powell Creamery, Shoshone project, purchased 10,300 pounds of butterfat during January, manufacturing 12,400 pounds of butter. Other agencies purchased 4,600 pounds of butterfat. Cream shipments from the Frannie division totaled 1,000 gallons, of which 40 per cent went to Powell.

JANUARY business of the Mini-Cassia Dairyman's Association, Minidoka project, was the largest in the history of the organization. Daily receipts of 2,000 pounds of butterfat were recorded.

AN organization known as the Minidoka Purebred Association, with capital stock of $25,000, has been incorporated on the Minidoka project. The purpose of the new company is to market to farmers on the project purebred stock, especially hogs, dairy cows, and sheep.

ROCK foundations for Gibson Dam, Sun River project, have been opened up along the upper end of the south abutment for a distance of about 200 feet. Work has been started on excavating the cut-off trench at the upstream toe of the dam for that portion of the south abutment already uncovered.

MANY inquiries are being received concerning the opening to entry of 145 farm units on the Tule Lake division of the Klamath project. The units are being opened on a rental basis and include an area of about 8,000 acres.

THE Great Northern and the Northern Pacific Railroads have begun their advertising campaign of opportunities for the purchase of land under option on the Lower Yellowstone project, one company reporting the receipt of 250 inquiries.

THE Utah-Idaho Sugar Co. has begun the construction of a new sugar factory at Belle Fourche. The beet spur to Vale has been located, with prospects that construction will begin with the opening of spring.

Commissioner Mead Urges Action on Colorado River Development

"There is no reason why the Nation should not favor early action on the Swing-Johnson measure, as its provision for entire repayment of the cost relieves the general taxpayer of any financial burden, present or prospective"

ASSERTING that the growing menace from floods on the Colorado River makes the construction of the proposed Boulder Dam an imperative necessity, Commissioner Elwood Mead. of the Bureau of Reclamation, recently urged early action in placing the Swing-Johnson bill before the House of Representatives in a letter to Chairman Addison T. Smith, of the House Committee on Irrigation and Reclamation.

The commissioner pointed out that recent appeals have been made to the bureau for investigations and advice regarding emergency measures for protection against floods on the river next summer and that engineers conducting surveys during the past two or three months agree that Imperial Valley is menaced by a disaster of dramatic proportions. All these engineers, he stated, agree that a reservoir large enough to hold back the floods and increase the low-water flow is necessary and that levees are only a temporary makeshift. The letter in full follows:

Hon. ADDISON T. SMITH,
Chairman Committee on Irrigation and Reclamation,
House of Representatives, United States, Washington, D. C.

DEAR MR. SMITH: My long and intimate contact with the farmers of Yuma and Imperial Valleys and my knowledge of their struggle to protect their farms and homes from being destroyed by Colorado River floods leads me to express the hope that early action may be taken in placing the Swing-Johnson bill before the House of Representatives.

The growing menace to the levees which now hold the river out of these valleys has led recently to appeals to this bureau for investigations and advice regarding emergency measures for protection from the floods of next summer. These valleys have been visited and reports made within the last two or three months by Colonel Jackson, of the United States Engineer Corps, by R. M. Priest, engineer, United States Reclamation Bureau, and Prof. Frank Adams, of the University of California. They are in agreement that the Imperial Valley is menaced by a disaster of dramatic proportions.

All agree that a reservoir large enough to hold back floods and increase the low-water flow is an imperative necessity. Levees are a temporary makeshift. The river runs along the rim of the Imperial Valley Basin. It is building up its channel through the deposit of the 100,000 acre-feet of silt carried down yearly by its sediment-laden waters. This means that levees must be raised higher and higher, with greater cost to maintain an increasing danger of failure. A break at a critical point may easily cause the loss of all that has been built up by 20 years of sacrifice and arduous effort. Only less serious is the recurring danger of drought during August and September. The loss of crops in one year has reached the staggering total of $6,000,000.

There is no reason why the Nation should not favor early action on this measure. Its provision for entire repayment of the cost relieves the general taxpayer of any financial burden, present or prospective. The stupendous dam will regulate the river. The All-American Canal to carry the water to Imperial Valley will end a vexatious and costly conflict with Mexico over international water rights.

The Government has been drawn into this great enterprise because no private company has offered to assume the risk and incur the expense of building the dam and related irrigation works, and no private company could adequately deal with interstate and international water rights, provide domestic water for the needs of cities, protect the rights of existing irrigators, and construct works for the irrigation of new areas. These complex factors make this a national enterprise in the truest sense.

It is fortunate, therefore, that building the dam creates great power possibilities. Without the revenue to be obtained from the sale of power at the switchboard, or the lease of the power privilege, this project would entail a burden of many millions of dollars on the taxpayers of the whole country. The power possibilities ought to be utilized and the revenue therefrom ought to be used to help pay for the works. The bill is so drawn that contracts to furnish the needed revenue must be signed before construction begins. It is a unique, safe, solvent, businesslike scheme.

The act is so drawn that the Secretary of the Interior is not required to build the power plant. He can lease the power privilege to private companies or municipalities who would erect their generating works, or he can build a power house and lease it with the water to those who would install electric machinery. These alternatives for dealing with the power opportunity are necessary in order to enable the Secretary to bargain to advantage. If he is deprived of authority to invite alternative proposals, I am convinced that competition will be restricted and the result will be an unworkable measure because of lack of revenue.

While the bill as drawn, embodies the Colorado River compact and is conditioned on ratification by six States of that compact, such condition is not essential to the accomplishment of the purposes of the bill. If these States do not desire to ratify, it is entirely within the power of Congress to provide for the protection of the upper States by subjecting this development to the terms of the compact in so far as it gives to those States the prior right to 7,500,000 acre-feet of water each year.

If these works are built, I favor such reservation of power to the different States of the lower basin as will assure them of cheap power for the development of their industries, but I am not in favor of power reservations that will enable them to levy toll on revenue due the Government and needed to repay construction costs. Until the entire investment of the Government has been repaid, all the revenue, whether from power sold at the switchboard of a Government plant or from water leases to private works, should go to the Federal Government. After that has been done, then the Government may properly consider who should be the beneficiaries of profits from the operation of these works, but an attempt to allocate now any part of the revenue from irrigation, sale of water for domestic purposes, or from power to anyone outside of the Government will, I fear, make financing the enterprise impossible.

If this bill is brought before the House, its discussion will educate the public as to the urgent necessities of the imperiled sections of the Southwest and as to the economic value of the latent resources which it will bring into use.

Sincerely yours,
ELWOOD MEAD, *Commissioner.*

Reclamation Policies Approved by Institute

Approval of the new Federal reclamation policies is contained in resolutions recently adopted at a conference of the Washington Irrigation Institute held at Seattle. The resolutions in full follow:

Whereas the Department of the Interior and its Bureau of Reclamation, after a careful investigation by a fact-finding commission and otherwise, have adopted a policy for future reclamation, under the Federal reclamation act as amended, based upon feasibility and necessity, which program provides that in undertaking new projects a program of settlement and development shall be included with the program for construction and that new projects shall be undertaken only after full investigation and approval of the Department of the Interior, and

Whereas it is believed that the adoption of such policy will result in the most orderly and most successful development of our remaining arable arid lands, which may be developed under this act: Therefore be it

Resolved, That the Washington Irrigation Institute approves this policy and program of the Department of the Interior.

About one third of our dairy cows are being kept at a loss, one third yield little or no profit, and the profits of the dairy business come almost altogether from the other third.

Southern Reclamation Conference Plans for Future Development

Enthusiastic meeting of representatives from eight Southern States held in Interior Department Building plans for increased appropriations to continue work of investigation of opportunities for planned rural development

EIGHT Southern States were represented at a Southern Reclamation Conference held on February 8 in the auditorium of the Interior Department Building to discuss planned rural development and the reclamation of neglected lands in the South by creating more attractive and prosperous farm life.

The meeting was opened at 3 p. m. by David R. Coker, of Hartsville, S. C., as presiding officer. Hon. Hubert Work, Secretary of the Interior, gave the address of welcome to the delegates, referring to the work already accomplished by the recent trip through the South of the special advisers on reclamation and rural development to investigate typical properties selected by State officials in each of the six States of North and South Carolina, Georgia, Alabama, Mississippi, and Tennessee. The Secretary was especially happy in his remarks and left no doubt in the minds of the delegates that he is thoroughly in sympathy with the proposed work and fully alive to the latent possibilities of planned rural development throughout the South.

Hugh MacRae, of Wilmington, gave a comprehensive outline of the purpose of the conference, stressing particularly the large amount of agricultural products which the South finds it necessary to import. He was followed by Dr. Elwood Mead, Commissioner of Reclamation, who spoke at length on the human side of reclamation, drawing a parallel between what the Bureau of Reclamation is doing on the reclamation projects of the West under the new policy and what must be done in any similar development in the South if the settlers are to have a reasonable assurance of success.

Dr. W. W. Long, director of Clemson College, S. C., then gave an interesting discussion of the effect of reclamation on Southern agriculture. Doctor Long spoke of the present agricultural conditions, the need of new people whose agricultural environment has been based on livestock and a diversified agriculture, the necessity of amending the national immigration law, why colonies have failed in the South, why community settlement should be encouraged, why the State and Federal Governments cooperating should undertake and control the first settlements, why some office or department of the State government should have administrative responsibility, and how the original settlements can be financed. In conclusion he pointed out that our future is likely to be determined by the relation of the people to the land and that we have not yet learned what the older countries of the world already know, that keeping people on the land must be one of the main endeavors of civilized nations.

George C. Kreutzer, director of reclamation economics, then spoke on recent improvements in financial and economic conditions on reclamation projects, using the Belle Fourche and Lower Yellowstone projects as examples of the application of the new policy of reclamation in making it possible for settlers to succeed. He was followed by Hugh A. Brown, chief of the division of settlement and economic operations, who gave some of his impressions of the recent southern trip by the special advisers on reclamation and rural development, supplemented by colored lantern slides illustrating the work of the Bureau of Reclamation from the standpoint of construction and development.

L. J. Folse, general manager of the Mississippi State Board of Development, closed the afternoon meeting with a characteristically enthusiastic address, calling attention to the opportunity afforded to the delegates of bringing to a successful conclusion the auspicious start already made.

In the evening the delegates, Members of Congress, and representatives of the Bureau of Reclamation attended a banquet at the Washington Hotel, followed by a large number of addresses by delegates and Members of Congress in support of the proposed work. Hugh MacRae, of Wilmington, acted as toastmaster. One hundred and fourteen men and women attended the banquet, including 8 Senators and 41 Congressmen.

After the banquet the committees from the Southern States held a meeting and appointed Rutledge Smith, general agent of the Tennessee Central Railway, of Nashville, Tenn., to put in concrete form the proposal for increasing the appropriation for surveys to be made by the Bureau of Reclamation as preliminary to the establishment on one demonstration project in each State to a total sum of $65,000 and to place this information before certain Senators and Congressmen.

It was decided that the several committees attending the conference from the Southern States should elect a State chairman and enlarge each State committee to the number of 20, selecting leading men who are interested in the question of improving southern agricultural conditions through a reclamation program as outlined at the afternoon conference. The meeting elected Hugh MacRae as chairman of the associated southern committees for the current year.

A list of those attending the banquet follows:

WASHINGTON, D. C.

E. C. Finney, First Assistant Secretary of the Interior.
Elwood Mead, Commissioner, Bureau of Reclamation.
George C. Kreutzer, director of reclamation economics.
P. W. Dent, assistant to the Commissioner, Bureau of Reclamation.
Charles A. Bissell, chief of engineering division, Bureau of Reclamation.
Hugh A. Brown, chief, division of settlement and economic operations, Bureau of Reclamation.
Copley Amory.
John M. Hager, Department of Commerce
J. J. Skinner, Department of Agriculture.
W. E. Price, general immigration agent, Southern Railway.
Oswald Skinner.
Mrs. Elwood Mead.
Mrs. George C. Kreutzer.
Mrs. Copley Amory.

ALABAMA

Lister Hill, Member of Congress, second district (Montgomery).
Henry B. Steagall, Member of Congress, third district (Ozark).
Lamar Jeffers, Member of Congress, fourth district (Anniston).
M. C. Allgood, Member of Congress, seventh district (Allgood).
Ed B. Almon, Member of Congress, eighth district (Tuscumbia).
George Huddleston, Member of Congress, ninth district (Birmingham).
William B. Bankhead, Member of Congress, tenth district (Jasper).
R. E. Seibels, Montgomery.
Bruce Beveridge, Selma.
F. T. Raiford, editor, Times-Journal, Selma.
H. H. Frasier, secretary chamber of commerce, Selma.
G. M. White, Mobile.

FLORIDA

Park Trammell, United States Senator.
Herbert J. Drane, Member of Congress, first district Lakeland).
R. A. Green, Member of Congress, second district (Starke).
W. J. Sears, Member of Congress, fourth district (Kissimmee).

GEORGIA

William J. Harris, United States Senator.
Walter F. George, United States Senator.
Charles G. Edwards, Member of Congress, first district (Savannah).
E. E. Cox, Member of Congress, second district (Camilla).
W. C. Wright, Member of Congress, fourth district (Newnan).
W. D. Upshaw, Member of Congress, fifth district (Atlanta).

S. Rutherford, Member of Congress, sixth district (Forsyth).
C. H. Brand, Member of Congress, eighth district (Athens).
W. W. Larsen, Member of Congress, twelfth district (Dublin).
J. M. Patterson, Albany.
Roland Turner, general agricultural agent, Southern Railway, Atlanta.
J. F. Jackson, general agricultural agent, Central of Georgia Railway, Savannah.
W. R. Neal, Savannah.
P. J. Brown, Albany.
Mrs. Paul J. Brown, Albany.

LOUISIANA

Bolivar E. Kemp, Member of Congress, sixth district (Amite).

MISSISSIPPI

Pat Harrison, United States Senator.
H. D. Stephens, United States Senator.
J. E. Rankin, Member of Congress, first distric (Tupelo).
B. G. Lowrey, Member of Congress, second district (Blue Mountain).
W. M. Whittington, Member of Congress, third district (Greenwood).
Jeff Busby, Member of Congress, fourth district (Houston).
Ross A. Collins, Member of Congress, fifth district (Meridian).
T. Webber Wilson, Member of Congress, sixth district (Laurel).
J. W. Collier, Member of Congress, eighth district (Vicksburg).
L. J. Folse, general manager Mississippi State Board of Development, Jackson.
B. E. Eaton, Gulfport.
G. M. McWilliams, Hattiesburg.
T. S. Jackson, secretary chamber of commerec, Hattiesburg.
Holt E. Ross.
Ben M. Stevens, Richton.
R. B. McLeod.
H. J. Schwietest.
P. G. Jones.
B. M. Walker.
A. D. Simpson.

NORTH CAROLINA

Charles L. Abernethy, Member of Congress, third district (New Bern).
H. L. Lyon, Member of Congress, sixth district (Whiteville).
Wm. C. Hammer, Member of Congress, seventh district (Ashehoro).
Zehulon Weaver, Member of Congress, tenth district (Asheville).
Hugh MacRae, Wilmington.
Jonathan Daniels.
Geo. A. Grimsley, Winston-Salem.
Chas. A. Flynn, Washington.
Guy A. Cardwell, agricultural and industrial agent, Atlantic Coast Line Railway, Wilmington.
J. W. Morton, Wilmington.
Nelson MacRae, Wilmington.

SOUTH CAROLINA

E. D. Smith, United States Senator.
Thos. S. McMillan, Member of Congress, first district (Charleston).
Butler B. Hare, Member of Congress, second district (Saluda).
John J. McSwain, Member of Congress, fourth district (Greenville).
W. F. Stevenson, Member of Congress, fifth district (Cheraw).
A. H. Gasque, Member of Congress, sixth district (Florence).
J. Campbell Bissell, Charleston.
W. P. Whelpley, Charleston.
P. F. McElwee, Charleston.
Thomas P. Stoney, mayor, Charleston.
David R. Coker, Hartsville.
Daniel C. Roper, former Commissioner of Internal Revenue.
R. E. Hanna, Cheraw.
Chas. E. Ivey, Clinton.
J. F. Jacobs, Clinton.
Morris Fass, president Coastal South Carolina Agricultural Development and Industrial Association, Dillon.
A. B. Jordan, Dillon.
H. K. Gilbert, Florence.
W. H. Daniel, Mullins.
Thos. S. Wilhur, Charleston.
W. M. Frampton, secretary Agricultural Society of South Carolina, Charleston.

TENNESSEE

Kenneth McKellar, United States Senator.
Lawrence D. Tyson, United States Senator.
S. D. McReynolds, Member of Congress, third district (Chattanooga).
Cordell Hull, Member of Congress, fourth district (Carthage).
E. L. Davis, Member of Congress, fifth district (Tullahoma).
Joseph W. Byrns, Member of Congress, sixth district (Nashville).
Gordon Browning, Member of Congress, eighth district (Huntingdon).
Finis J. Garrett, Member of Congress, ninth district (Dresden).
Hubert F. Fisher, Member of Congress, tenth district (Memphis).
Rutledge Smith, general agent Tennessee Central Railway.
J. A. McNeill, traffic manager, Tennessee Central Railway.
Frank W. Lewis.

PRESS REPRESENTATIVES

Richard Woods Edmonds, Manufacturers Record, Baltimore, Md.
David F. St. Clair, Greensboro News, North Carolina.
Russell Kent, Washington correspondent, Birmingham News, Montgomery Advertiser, Knoxville Journal.
Hubert Holloway, North Carolina, representing H. E. C. Bryant, the Charlotte Observer, the Asheville Citizen, the Wilmington Star.

Reclamation Conference at Denver

March 16-18, 1927

A CONFERENCE of superintendents, district counsel, and others, including members from the Washington and Denver offices of the Bureau of Reclamation, will be held at the Denver office beginning at 9 a. m. March 16, 1927, and closing at 4.30 p. m. on March 18, 1927.

The purpose of this conference is to discuss the problems before the bureau in order to bring about more uniform and efficient methods and a better understanding of recently enacted legislation.

Tentative Program

FIRST DAY, MARCH 16

GENERAL

Introductory, Dr. Hubert Work, Secretary of the Interior

Progress of reclamation during the past year and future problems, Dr. Elwood Mead, Commissioner

CONSTRUCTION AND OPERATION AND MAINTENANCE

Mr. Walter, chief engineer, chairman

1. Résumé of work in progress during 1927 and proposed with 1928 appropriations ..... R. F. Walter.
2. Investigation of new projects ..... E. B. Dehler.
3. Allotments and authorities ..... L. R. Smith.
4. Submission of data for design and estimates ..... W. H. Nalder.
5. Transfer of equipment and supplies ..... S. O. Harper.
6. Personnel and civil-service regulations ..... G. A. Bonnett.
7. Problems of the field ..... H. D. Comstock.
8. Discussion of operation and maintenance report as prepared by the special committee ..... P. J. Preston.
9. Discussion, questions, and answers.

SECOND DAY, MARCH 17

LEGAL AND FINANCIAL

Mr. Dent, assistant to the commissioner, chairman

1. Recent legislation ..... P. W. Dent.
2. Contracts with irrigation districts ..... B. E. Stoutemyer.
3. Advertisement and specifications (new forms) ..... A. Offutt.
4. Operations under the fact finders' act of Dec. 5, 1924 ..... W. J. Burke.
5. Operations under the adjustment act of May 25, 1926 ..... J. R. Alexander.
6. Accounting requirements ..... W. F. Kubach.
7. Application of credits under subsections I and J, act of Dec. 5, 1924 ..... E. B. Darlington.
8. Collections and obligations ..... J. L. Lytel.
9. Obligations of irrigation districts and water users' associations on transferred projects ..... P. W. Dent.
10. Preparation of cost and returns reports and appropriation estimates for Budget ..... W. F. Kubach.
11. Discussion, questions, and answers.

THIRD DAY, MARCH 18

SETTLEMENT AND FARM DEVELOPMENT

Mr. Kreutzer, director of reclamation economics, chairman

Introductory by Doctor Mead

1. Settlement and farm development problems ..... G. C. Kreutzer.
2. Plans for settlement of the Belle Fourche project ..... F. C. Youngblutt.
3. Subdivision and exchange of land at Badger Pocket ..... W. R. Young.
4. Exchange of entries on Shoshone project ..... L. H. Mitchell.
5. Adjustment of classes 5 and 6 land under act May 25, 1926 ..... H. H. Johnson.
6. Crop census to determine average gross incomes under crop repayment contracts ..... G. O. Sanford.
7. Appraisal and value of land on new projects ..... B. E. Hayden.
8. Discussion, questions, and answers.

Necessity for Making Payments Greatest Blessing, Says Manager

(From the Hermiston (Oreg.) Herald)

ONE of the chief needs of the Hermiston district is fewer tenant-operated farms and more owner-operated farms, according to the opinion expressed by Enos D. Martin, project manager. His opinion was based on a study of crop returns and his observation of farming operations.

"The paternal policy of the Government has made it possible for absentee landlordism, or tenant operation of farms, to continue," Mr. Martin said, but he expressed the belief that farm operation in the future on the project is destined to shift more and more from the hands of tenants to those of the owner.

Mr. Martin said:

Under the policy that was followed by the Government for a number of years in the matter of not requireng payment of operation and maintenance and construction charges from landowners the absent owners were willing to rent their places for what they could get. Under the supplemental contract between the district and the Government charges must be paid, and owners must of necessity get more revenue from their places, dig up the charges out of their pockets, or face the alternative of losing their places.

Tenant farming on some kinds of land in certain types of farming is fairly satisfactory, but as a general proposition on irrigated land, particularly with the soil we have here, it results in the farm being run down rapidly and marks a decrease in its productive capacity. I know personally of a number of farmers who are renting as many as five or six or more small acreages.

To operate so much irrigated land in separate acreages to advantage is simply a physical impossibility. Usually water is turned in at irrigating time and allowed to run where it will. Damage to the land and ditches and inadequate irrigation follow, with the result that at hay-harvest time only patches will be worth cutting. The tenant gets half of what he thinks will pay to harvest, and the owner gets his half. In the future the owner must have more if he is to continue to own the land.

The necessity of meeting water payments will result in better farming operations on the project with some changes in ownership, which will mean that the new owners will take over operation of their own land and bring it up to the level of production now maintained on the average owner-operated farm.

"Shoestring" operations have also been responsible for lack of success on the part of some settlers, and as this type of ownership of farm land decreases and is replaced by those who have sufficient equities in their lands to make success easier the percentage of failures will be even less.

The necessity of making payments is bound to be one of the biggest blessings we could have on the project, in my opinion. Land banks and others holding mortgages have made it plain that they will protect their mortgages by paying charges if the present owners do not, so the ultimate result promises to be greater stability of both values and production after the adjustment has been made than we have ever enjoyed.

Mrs. E. F. Van Hise Finds Turkeys Pay

Mrs. E. F. Van Hise, who lives west of Paul on the Minidoka project, Idaho, decided to raise turkeys in a small way last year. She kept a strict account of her expenses and income and is convinced that a farmer's wife can find no more profitable side line than that of turkey raising.

Starting last spring with 6 turkey hens, Mrs. Van Hise raised 115 birds. Of these she sold 46 to the Thanksgiving trade and 32 at Christmas time and received in cash the sum of $412.34. Nearly $50 more was received for birds sold for breeding purposes.

Mrs. Van Hise also had 48 White Leghorn hens, and her records show that they not only paid in eggs for their keep but also bought the turkey feed.

Mrs. Van Hise writes that last year was the first year of her life spent on a farm. Her motto is well worth quoting: "If you want a thing, go after it and you can get it."

If the dairy herd is culled intelligently on the basis of individual cow records, if the remainder are fed according to known production, and if only good purebred sires are used, almost any dairy herd, regardless of its condition at the start, will eventually be placed on a paying basis.

A few of the turkeys raised by Mrs. Van Hise

Construction Type of Echo Storage Dam

The first division of the Salt Lake Basin irrigation project, Utah, comprises the construction of the Echo Storage Dam and Reservoir on the Weber River and a diversion canal from Weber River to Provo River, at an estimated cost of $3,000,000.

Under present plans the main body of the Echo Dam will consist of a natural mixture of clay, sand, and gravel placed in horizontal layers, moistened and compacted by rolling in accordance with the best modern practice for this type of embankment. The downstream portion of the dam will be reinforced by a heavy toe of rock fill and with a heavy blanket of gravel over the entire downstream face. The upstream face will be protected by a layer of heavy riprap 4 feet thick. The top of the embankment will be protected by a reinforced concrete parapet wall, and the net freeboard above the high-water surface in the reservoir will be 13 feet. Impervious construction will be carried below the natural foundation surface to a water-tight closure with the underlying bedrock.

Recent Improvements in Financial and Economic Conditions on Reclamation Projects[1]

By George C. Kreutzer, Director of Reclamation Economics

LAST year at a meeting of representatives from many of the western railroads and others interested the problems of some of the reclamation projects were discussed. It was the purpose of those attending to work out plans of improving their financial and economic conditions.

THE BELLE FOURCHE PROJECT

The Belle Fourche project in South Dakota furnished an illustration of a project having a large number of nonresident owners and with this a large delinquency in water payments and delayed farm development. When this project was settled, any citizen who had not used his homestead right could secure a farm. Many of the owners were living in distant cities and were making their incomes from occupations widely separated from farm life. They were leasing their farms to resident owners who, in many instances, already had more land than they could cultivate. On such leased farms farm buildings were dilapidated and fields were weedy. Yields were low, and the rents were in many cases less than taxes.

DEVELOPMENT AT A STANDSTILL

In 1925, 17 years after water first became available, only 31 per cent of the project was cultivated by resident owners. The remaining land was owned by nonresidents or mortgage companies and banks, and water payments were not being made. State and county taxes were in default, industries were at a standstill, and people were leaving the project instead of new settlers coming in; yet the project had fertile soil, an abundance of cheap water, and a climate that favored the production of high-priced crops.

The settlers and the Government had come to the crossroads. If the financial and economic conditions of this project could not be improved, then it would be better to abandon it and lose a large portion, if not all, of the $4,000,000 that had been invested in irrigation works rather than to risk additional funds for operating to await good times. Moratoria had previously been granted, but the improved conditions to meet the Government's debt had not arrived. On the other hand, if a constructive program could be worked out and the morale of settlers strengthened the investments of the Government and settlers could be saved and a community of home owners established that would be an asset to the State and Nation.

[1] Address delivered at Southern Reclamation Conference, Washington, D. C., Feb. 8, 1927.

NEW PROGRAM ADOPTED

The program outlined last year with some modifications was adopted. Options in favor of the Government were obtained on 95 farms which were more or less uncultivated or unoccupied. The prices and selling terms are controlled for three years. In addition, agreement was reached with the State banking department and those administering the State rural credit act and school lands to sell 70 farms owned or controlled by these institutions at reasonable prices and on liberal terms. Thus 165 farms were made available for sale at prices varying from $12.50 to $108 an acre.

The farms offered for option were appraised by an independent committee, who through years of experience understood land values and local farming conditions. The appraisal committee took the view that nothing but real farm opportunities should be offered to settlers. If the price asked by the owner was less than or equal to the appraised value, an option was taken. If he wanted more than the appraised value and could not be induced to reduce his price, an option was not taken. A uniform land-selling contract was worked out. This included the following:

(*a*) Settlers to make an initial payment of 10 per cent in cash at time of purchase.

Oats and sugar beets in irrigated rotation, Belle Fourche project, South Dakota

(*b*) For the next two years only simple interest at the rate of 6 per cent to be charged.

(*c*) The remainder of purchase price to be repaid in 36 semiannual amortized payments with interest at 6 per cent.

(*d*) Settlers who purchase unimproved farms to effect improvements to the value of 25 per cent of the purchase price in the first two years, one-half of this in the first year.

(*e*) Settlers to insure and keep insured all insurable improvements in the name of the landowner and the purchaser as their interests appear.

(*f*) Settlers to apply for a Federal land bank loan when requested to do so by the owner and pay off the remainder of the purchase price owing.

These purchasing terms permit settlers of small means to use a large portion of their capital to improve farms and buy livestock and also provide that farms may be purchased out of farm income.

The fixing of land prices and liberal repayment terms are two important steps in any settlement plan.

The next step was to arrange for cooperative advertising and take care of new settlers.

The Belle Fourche Chamber of Commerce issued a general illustrated folder describing the locality. The Bureau of Reclamation is publishing a booklet giving authentic information on the project and the farms for sale. A paragraph is given in the booklet to the description of each farm, showing its area, character of soil, kind of house and outbuildings, fences, amount in alfalfa, area prepared for irrigation, distance from school, town and shipping point, and finally its sale price, initial deposit, and half-yearly payment. Each of these are definite opportunities and will appeal to prospective settlers.

An agent of the bureau is being assigned to this project to assist new settlers in selecting farms suited to their capital, helpers in family, and character of farming desired. He is a practical irrigator and understands the rotation of crops and the kind that should be planted. He will know where good dairy cows and sheep can be bought, as well as other stock and farm equipment. After settlement he will assist new settlers with their financial and economic programs. He will have his hand on the settler's shoulder to give him encouragement and will see that capital goes into those farm enterprises which will insure income.

The advertising will be done by the railroads and other interested agencies. It will consist of liner ads in farm journals and by solicitation.

AMAZING RESULTS FOLLOW

The program has been in effect for a short time only, but the results are amazing. The water users paid $12,000 in 1926 in excess of the amount required under their contract. The Utah-Idaho Sugar Co. is expending $1,500,000 for the erection of a new sugar refinery at Belle Fourche; the State is expending $125,000 to gravel arterial highways to transport sugar beets from farms to beet dumps; Butte County is expending $75,000 to gravel feeders to the arterial highways for the same purpose. The Squire-Dingee Co., of Chicago, is enlarging its facilities to handle cucumber pickles and is expending $75,000. This will provide the largest pickle-receiving station in the world. Congress appropriated $125,000 to begin the construction of a complete drainage system. This will relieve all lands at present seeped or waterlogged. It is the beginning of a million-dollar drainage program. The Chicago and North Western Railroad Co. will expend $500,000 in the extension of spurs for transporting beets to factories. The total amount that will be spent within the next year or 18 months in this locality will approximate two and one-half million dollars. A year ago none of the institutions making these improvements felt they could risk their capital. The morale of farmers was low and the future was uncertain. No promise of the construction of a sugar factory could be obtained. The railroad did not feel like expending money for beet spurs unless they knew that farmers were coming in to grow this high-priced crop. This program has had its effect on securing settlers. The secretary of the irrigation district advises that in round numbers 100 additional families will come to the project for the 1927 cropping season. Part of them have already arrived. Hardly a day passes without the arrival of a carload of livestock, farming equipment, furni-

A well-developed home on the Belle Fourche project, South Dakota

ture, and other possessions of land seekers. One day several such cars arrived. The sugar company has secured contracts from farmers for more than 8,000 acres of sugar beets to be grown in 1927. Previously the largest area grown in any year was 3,000 acres.

All of this points favorably to the payment in full and on time of all current water charges due the Government. Everyone expects to pay and plans accordingly.

This program is cumbersome because the bureau has not the authority to supply some of the essentials to a modern colonization plan. No provision has been made for credit to complete the development of farms or to prepare land for irrigation before settlement. Fortunately many of the farms have houses, barns, other outbuildings, and fences and have an area already sown to alfalfa. Farmers who buy these will largely overcome the lack of these facilities which would otherwise be needed.

THE LOWER YELLOWSTONE PROJECT

What has been and is taking place on the Belle Fourche project is being repeated on the Lower Yellowstone project in Montana. Eight thousand acres have been secured under options on this project. The same form of uniform selling contract has been adopted, and a booklet is being issued describing the farms for sale.

The Great Northern and Northern Pacific Railroad Cos. are already advertising in 30 farm journals, and, while these ads have only been running a few weeks, the Great Northern Railroad has received 250 inquiries and is urging us for a supply of the booklet so proper information may be sent to these people. Likewise, the Northern Pacific is receiving inquiries in large numbers. The chamber of commerce of Sidney, Mont., is engaging a man to personally solicit skilled irrigators who understand the growing of sugar beets and other high-priced crops.

A new contract was made with this project last year. In 1926 they paid the full operation and maintenance charge and the amount required on construction. It is the first time they have done so, even though water has been available for 18 years. The contract provides for the establishment of a revolving fund to buy tax titles. The collections already made show that more has been raised for this purpose than was required for the first year. Collections of irrigation assessments are likewise satisfactory.

ORGANIZATION AND TEAMWORK WIN

What is taking place on these projects can be accomplished on any project where the cost of water is reasonable and where the soil and climatic conditions favor the growing of profitable crops. These basic economic factors for successful development have not been changed at Belle Fourche and Lower Yellowstone, but organization and teamwork put them to their highest use. Projects, as is the case with other communities, succeed on carefully worked-out programs vigorously backed and put into effect by all concerned.

Tule Lake Lands Open to Entry

Public notice has been issued by the Secretary of the Interior announcing the opening to entry on March 1, 1927, of 145 public-land farm units in the Tule Lake Division of the Klamath irrigation project, Oregon-California.

The division will be operated on a water-rental basis until its agricultural development has advanced sufficiently to permit a district organization, at which time a so-called joint liability contract will be required, as provided for in section 45 of the act of May 25, 1926, and the construction charge will be announced at $88.35 per acre, payable over a 40-year period. Should the water users fail or refuse to organize a district and enter into the contract, it will be necessary to issue public notice under the extension act of August 13, 1914, without regard to the write-off under the recent adjustment act and under a 20-year repayment plan. This would result in a construction charge of $100.55 per acre payable in 20 years.

Under the present public notice water will be furnished for each of the irrigation seasons of 1927 and 1928 at $1.85 an acre for each irrigable acre in the farm unit, which will entitle the entryman to 2 acre-feet of water per acre. Additional water will be furnished at the rate of 75 cents per acre-foot. The irrigable area of the farm units averages about 50 acres. Ex-service men have a preference right of entry, but selection of applicants will be made by an examining board on approved qualifications of industry, experience, character, and capital, of which the applicant must have at least $2,000 or its equivalent in livestock, farming equipment, or other assets.

Additional information concerning the opening may be obtained from the superintendent of the Klamath irrigation project, Klamath Falls, Oreg., or from the Commissioner, Bureau of Reclamation, Washington, D. C.

Sugar-Beet Production on the Projects

Advance statistics compiled by the Bureau of Reclamation show that last year sugar beets were grown on 62,407 acres on 11 Federal irrigation projects, producing 614,386 tons, valued at $4,619,233, or $74 per acre.

The largest acreage, yield, and value appeared on the North Platte project in Nebraska and Wyoming, where nearly 33,000 acres produced 347,000 tons, valued at $2,663,000, or $81.11 per acre. The highest value per acre, amounting to $94.83, was on the Belle Fourche project, South Dakota. The average yield per acre for the 11 projects amounted to 9.8 tons, with the highest average yield of 11.5 tons on the Belle Fourche project. Complete statistics for the 11 projects are given in the accompanying table.

Sugar beets on irrigation projects, 1926

Project	Acreage	Yield		Value	
		Total tons	Per acre tons	Total	Per acre
Grand Valley, Colo.	1,536	12,644	8.2	$94,830	$61.74
Uncompahgre, Colo.	3,575	32,824	9.2	229,938	64.31
Minidoka, Idaho	1,865	9,519	5.1	57,078	30.60
Huntley, Mont.	4,767	52,744	11.06	448,324	94.04
Milk River, Mont.	2,816	23,970	8.5	155,805	55.32
Sun River, Mont.	114	1,507	9.2	8,456	74.17
Lower Yellowstone, Mont.-N. Dak.	5,180	50,286	9.7	301,716	58.25
North Platte, Nebr.-Wyo.	32,837	347,230	10.5	2,663,390	81.11
Belle Fourche, S. Dak.	2,184	25,104	11.5	207,108	94.83
Strawberry Valley, Utah	3,820	19,592	5.1	117,552	30.77
Shoshone, Wyo.	3,713	39,416	10.6	335,036	90.23
Total	62,407	614,386	9.8	4,619,233	74.02

THE State Extension Service held a three-day Farm Economic Conference for Irrigated Land at Sidney, Lower Yellowstone project, early in February. Questions discussed included cultural methods, varieties of crops, preparation of land, sugar beets, potatoes, livestock feeding, and other pertinent subjects. It is expected that the printed reports, based on recommendations of various commodity committees, will be of great value to new settlers in assisting them to get started on the right program.

In many dairy herds the profits of the highest producers just about offset the losses of the lowest producers.

Intelligent selection of dairy animals is the first step in building up a high-producing herd.

Canadian Soldier Settlement Act

From International Review of Agricultural Economics

THE following extracts from an article in the International Review of Agricultural Economics, January–March, 1926, by H. P. Desjardins, secretary to the Assistant Deputy Minister of Agriculture, Canada, will be of interest to those who are studying the question of aided and directed settlement in the United States.

The soldier land settlement act of 1917, as amended in July, 1919, gave the land settlement board of three commissioners power to grant a loan to every eligible soldier settler possessing sufficient capital to supply the needs of his family until the next harvest and to pay a first installment amounting to at least one-tenth of the purchase price of the land. The loans that might be granted were divided into three catagories:

FINANCIAL AID

1. For eligible settlers buying their farms through the commission:

(a) A maximum of $4,500 for the purchase of land;

(b) A maximum of $2,000 for the purchase of stock, plows, or other implements;

(c) A maximum of $1,000 for buildings and other permanent improvements.

2. For eligible settlers established on Federal lands in the western Provinces:

A maximum of $3,000 for the purchase of livestock and implements, for buildings and other permanent improvements; in this case the total advanced was determined by the guarantees which the settler could furnish.

3. For eligible settlers already possessing arable land:

(a) A maximum of $3,500 for the payment of mortgages; but the sum advanced for this purpose could not exceed half the estimated value of the farm;

(b) A maximum of $2,000 for the purchase of livestock, plows, and other implements;

(c) A maximum of $1,000 for buildings and other permanent improvements.

The total of the possible loans to settlers belonging to this last catagory could not exceed $5,000.

RESULTS

Up to December 31, 1924, the number of soldiers settled on the land was 30,604, and the number of loans granted 24,148, representing a total sum of $103,150,098.73, of which $59,800,229.35 was utilized for the purchase of land, $2,559,259.71 for the paying off of mortgages on farms, the private property of soldier settlers, $10,608,979.67 in payment of permanent improvements effected, $29,782,430.69 for the purchase of stock and plowing implements, and $399,199.31 disbursed to Indian settlers through the department of Indian affairs.

Of the 24,148 settlers to whom loans were granted, 4,229 are established on public Federal lands, 2,463 on private properties, and 17,456 on lands purchased.

The average loan to soldiers is about $2,266 in each case.

The total sum advanced is guaranteed by a first mortgage on 4,219,439 acres of land; in addition 1,549,440 acres were sold by the Federal Government, on which no advance was made, making the total area granted in virtue of the law 5,768,879 acres.

In the course of the fiscal year 1923–24 a total sum of $3,195,209.91 was received by way of repayments of money lent, exclusive of the first ready money payments made in respect of sales effected in the course of this financial year. From January 1, 1924, to November 30 of the same year the sum derived from the same source amounted to $2,331,458.69.

Altogether 727 settlers have completely cleared their debts; of these, 336 have subsequently ceased farming, leaving a total of 391 settlers at present working on their farms.

RESULTS OF NONSELECTION OF SETTLERS

The number of farms abandoned since the act began to work is 5,203; that is, 21.5 per cent of the whole; out of this number 1,863 have been or are about to be resold, leaving a total of 3,340 farms unsold, that is, 13.8 per cent. The causes for abandonment are numerous and include death, bad health, and other causes beyond control. A good number result from the reappearance of disabilities, the results of war service. It would, however, appear that a number of cases of abandonment may be ascribed to lack of aptitude, instability of character or temperament either on the part of the soldier settler or of his wife. (Note: Apparently much of this could have been obviated by proper selection of settlers in the first place.—*Editor.*)

Successful dairying depends on many factors. Among these, culling is one of the most important. The most successful dairymen closely cull their herds.

Keeping feed records and weighing and testing the milk regularly make it possible to determine the production of your cows with a high degree of accuracy.

Southern Work Indorsed by Railway Association

At a recent meeting of the Railway Development Association of the Southeast, the following resolution was adopted:

Whereas the Interior Department of the United States, through its Bureau of Reclamation, has recently sent to the South under authorization by Congress, a capable committee to investigate the farm settlement possibilities of this region, and the result of said investigation is to be the subject of a report to Congress: Be it

Resolved, That the Railway Development Association of the Southeast does hereby most heartily indorse the purpose of the investigation and pledge the support of our members in aiding in every way that we possibly can such further efforts as the Congress of the United States may authorize the Bureau of Reclamation to make in inaugurating in the Southern States the establishment of some supervised and properly planned farm settlements which shall serve as a demonstration of the best possible methods for aiding the development of the South through helping to establish upon the land a farming population of successful, prosperous, and contented farm owners.

South African Engineers Appreciate Bureau Aid

Commissioner Mead has received the following letter of appreciation from Mr. S. B. Shannon, of the irrigation department of the South African Government, who, in company with Mr. N. Shand, of the same department, visited recently a number of the irrigation projects under the Bureau of Reclamation:

On the eve of our return to South Africa, on behalf of Mr. Shand and myself, I wish to thank you and the Reclamation Service for the kindly interest and the practical assistance which have made our trip so interesting and, from our point of view, so great a success.

The numbers of engineers we have met, the varieties of views expressed, and the underlying spirit of optimism and keenness met with everywhere have proved tremendously stimulating. We are returning to South Africa filled with a new energy and enthusiasm for engineering. There we hope to put our experience to practical use.

Thank you again for the great opportunity which you placed in our way.

Tenth Annual Glenn County Fair, Orland, California

Throughout its ten years of existence the Glenn County Fair has established the record of being designated as one of the most successful and best managed county fairs in California

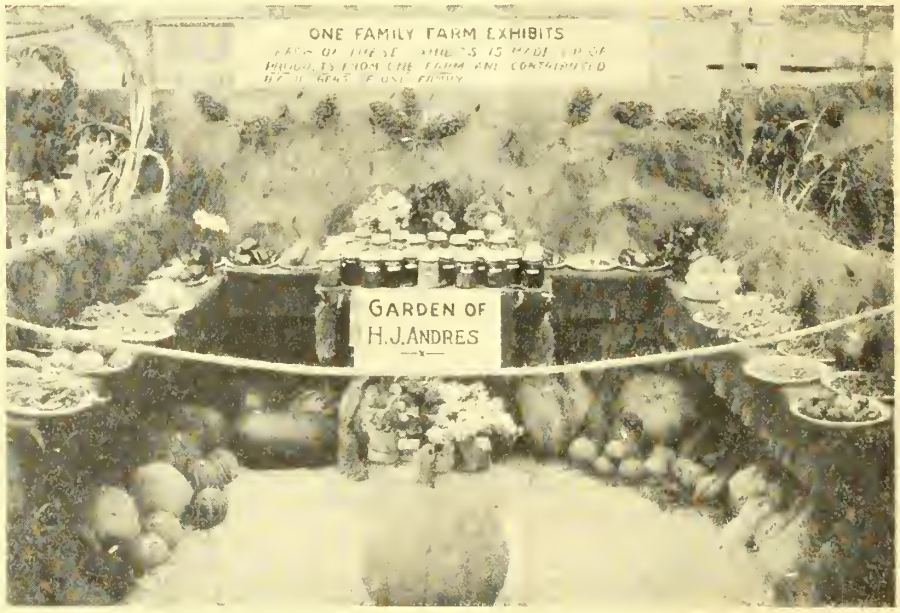
By R. C. E. Weber, Superintendent, Orland Project

THE tenth annual Glenn County Fair was held at Orland, Calif., during the week of September 20 to 25, 1926, inclusive. The inception of the Glenn County Fair dates back to the fall of 1916, at which time a number of stock owners in the vicinity of Orland assembled a collection of livestock for stock-judging purposes. This gave birth to the idea of an annual fair, with the result that an organization, entitled The Glenn County Livestock and Agricultural Association and duly organized under the laws of California, was formed. In the following fall of 1917 the First Annual Glenn County Fair was held, which has been followed by an exhibition each succeeding year.

The fair has been uniformly successful throughout the period of years that it has been in existence. Twelve acres of ground within the incorporated limits of Orland have been acquired with the original capital and the surplus of each year's operations. Permanent improvements, consisting mostly of fencing, livestock pens, and other minor structures, have been erected on the grounds. Trees planted in the first year of the fair's existence now add to both the attractiveness and the utility of the grounds. Throughout its 10 years of existence the Glenn County Fair has established the record of being designated as one of the most successful and best managed county fairs in California.

ONE-FAMILY FARM EXHIBIT

Probably one of the predominating, and doubtless the most instructive, features of this year's fair was the one-family-farm exhibit, displaying agricultural products raised on a single farm. It was required that all products exhibited be grown in 1926 by members of the family exhibiting them and upon the farm occupied by them. There were three entries in this class of exhibits, two exhibitors being owners of farms within the project and the third displaying products from a farm immediately adjoining the project area but deriving its water supply from a well. First prize was awarded to the latter, the second and third premiums going to the two project farms. The ratings of the three exhibits were so close that a fraction of 1 per cent in the judges' ratings determined the relative standings. The variety of products exhibited—all raised on the same farm—was amazing. More than 50 different products from a 40-acre farm were exhibited in the display of E. J. Guilford, a comparatively newcomer to the Orland project. Included in the one-family-farm exhibits were fruits, both fresh and canned, vegetables of all varieties, field crops, nuts, honey, root crops, flowers, and seeds. This is the first year that the plan of the one-family-farm display has been tried out, and the interest aroused, together with the favorable comment on the pioneer exhibits at the tenth annual fair, predicts a larger list of entries and keener competition in succeeding years. That the pioneer exhibit at this year's fair is the beginning of a new line of fair displays is manifested by the fact that the California National Bank, of Sacramento, Calif., has announced a magnificent trophy during 1927 for the best one-family-farm exhibit shown at any of the county fairs throughout California.



Prize-winning display of one-family farm exhibits

COUNTY EXHIBITS

The general county exhibits were grouped in an attractive manner, displaying to best advantage the array of products from the soil and forcefully indicating the agricultural resources and the progressive development of the county. The floricultural department occupied a prominent place near the entrance to the main tent, with an attractive exhibit of pines, a bordering circle of cypress, and an abundance of flowers and potted plants. The horticultural division displayed a large variety of fruits, in which citrus products from the Orland community were prominently featured. The display of agricultural crops, both field and garden, although not up to the standard of some of the previous fairs, nevertheless demonstrated to the visitor, through the surprisingly large variety of products displayed, what may be brought forth from Glenn County soil when intelligent farming methods are applied. The farm center exhibits, which on the occasion of many previous fairs had been the centers of attraction, were again in evidence but not to the extent of prior years. The Codora center, coming nearly 30 miles from the extreme southeastern part of the county to exhibit its display, was awarded the blue ribbon in the farm center display contest. A booth prepared by the Willows Chamber of Commerce and displaying products—industrial as well as agricultural—of the area contiguous to the county seat was one of the best, as well as one of the most interesting, exhibits of the fair.

LIVESTOCK

The livestock department was not lacking in high-class, purebred animals.

The famous Aberdeen-Angus show cattle of the Harrison Stock Farms, of Woodland and Kirkwood, Calif., were on exhibition. It is said that no herd of black cattle in America has such a large aggregation of prize-winning bulls and cows as this collection. Blackcap Revolution, grand champion of the 1925 Chicago International Livestock Show, is probably the most famous animal in the herd. Prize-winning Duroc-Jersey hogs at this year's State fair in Sacramento were also on exhibit at the Glenn County Fair by the Harrison Stock Farms. The purebred Jersey herd of Edna L. Knight, numbering 30 prize winners of both California and Oregon State fairs, was a center of attraction for admirers of Jersey cattle as well as the recipient of many first awards. The entries of Holstein cattle were numerous, the herd of J. N. Cook, an Orland project landowner, receiving most of the premiums awarded this breed of cattle. In the swine department, Durocs, Poland-Chinas, Chester-Whites, and Berkshires were entered. Both the poultry and sheep departments were well represented by entries of various fowls and the standard lines of sheep.

STONY GORGE DAM DISPLAY

The Orland Unit Water Users' Association, in collaboration with the project office of the Bureau of Reclamation, prepared a display devoted principally to the Stony Gorge supplemental construction of the Orland project. A large drawing showed the Stony Creek watershed and the location of the Stony Gorge Reservoir with relation to the project area and the existing storage works at East Park. Another drawing exhibited plans and designs of the Stony Gorge Dam. The secretary of the association, assisted by the president and directors, together with employees of the project office, was in constant attendance to answer inquiries of interested visitors.

AMUSEMENT FEATURES

The amusement features of the fair were many and varied. Centrone's Military Band of 20 pieces, coming direct from the Philadelphia Sesquicentennial Exposition, rendered two concerts daily during the six days of the fair. Gypsy and Marta, Pacific coast wide-renowned radio artists from station KPO of San Francisco, were present in person and delightfully entertained twice daily during three days with musical numbers. An open-air dancing platform with music by a five-piece orchestra was crowded to capacity every evening. A fashion show, displaying the latest foreign creations in feminine apparel, brought cross country from New York via airplane, was the center of attraction during the evening allotted to it on the program of events. The "Zone," appealing to the popular fancy, was occupied by the Foley and Burke Carnival Shows. One evening of the week was given over to a boxing tournament.

All exhibits, except livestock and poultry (for which permanent sheds are provided), were sheltered under an immense tent 150 by 350 feet in size. The entertainment features of the fair were held in a smaller tent with a seating capacity of 1,200. The "Zone" occupied an outdoor area of approximately 3 acres.

GLENN COUNTY SCHOOL DAY

The event drawing the largest attendance was the parade of school children on September 21, officially designated as Glenn County School Day. Classes in all schools throughout the county were suspended for the day and the children formed a large parade, in which about 3,000 pupils and four bands (three of which were school organizations) participated. Historical pageants, based on events in American history, were illustrated by various schools.

Indicative of the magnitude of operations involved in connection with the fair are the total expenditures for this year's exhibition, approximating $15,000. Sufficient revenues, notwithstanding gate receipts of $1,000 less than those for the previous year, were derived, so that the fair again paid its way and continued its past record of financial success. Its larger and broader usefulness and value, however, lie in the medium which it affords for fostering and promoting cooperative and friendly competitive effort. Better agricultural products and higher-grade livestock result from the competition manifested in the displays of farm products and in the exhibition of livestock. The spirit of neighborliness and getting better acquainted, which is encouraged by attendance at the fair, is not without its compensating value.

ALL THE RESULT OF IRRIGATION.

It is well within the realm of fact to state that irrigation alone has made possible the annual Glenn County Fair. Before the advent of extensive and intensive irrigation the farm products of the county consisted almost exclusively of grain, which was grown year after year until a considerable part of the land had become so impoverished in fertility that it would yield a profitable crop only on alternate years and following a season's rest. It remained for irrigation to bring forth from this depleted soil diversified farm products, which were followed by the introduction of high-class livestock, all of which are essentially necessary for a successful county fair. In this connection the Bureau of Reclamation has played no small part through the instrumentality of the construction and operation of the Orland project.

Yakima Farmers Spend $2,950,000 for Autos

The Yakima Daily Republic states in a recent issue that every fifth family in the Yakima Valley, Wash., bought a new automobile during the past year. The article is as follows:

"What price prosperity? Yakima residents have been inclined to grumble a bit at the fates during the past year, because some of them failed to sell potatoes at the peak price; others did not get what they anticipated for their apple crop; and still others found their year's return in business endeavors below that for which they had hoped. But, admitting that the year was not a period of marked boom, no less than 2,950 new automobiles were purchased from valley dealers during the period. That represents one new auto for every five families, a better showing in new machines alone than many districts can make when all automobiles, including those of truly revered and ancient history, are considered. And even with that heavy investment in new cars, bank deposits in the city of Yakima increased a quarter million in the year."

Assuming a value of $1,000 for each of the 2,950 automobiles sold, we have the rather tidy sum of $2,950,000 spent for automobiles. Out of the 350,000 acres under irrigation in the valley the Bureau of Reclamation is supplying water to about 140,000 acres and the Indian Service to about 80,000 acres, so it is evident the greater part of these machines were purchased by farmers living on Government projects.

NEW settlers who leased farms on the Belle Fourche project have begun to arrive with their stock and equipment. Immigrant cars unloading at Newell and Nisland indicate a definite trend to the unoccupied farms in contrast to the situation that has existed for the past five years. Although nearly all farms with habitable buildings have been rented, the demand continues, and a movement is on foot to create a credit corporation for the construction of farm buildings.

Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

Suggestions for Lightening the Farm Woman's Work

Caring for floors

FINISHED floors can be kept in good condition with a comparatively small outlay of time and strength, but the method must be adapted to the kind of finish. A string or cloth dust mop, such as is shown in the illustration, is almost a necessity in the home where the floors are varnished, waxed, oiled, or painted. A cotton flannel bag may be drawn over the broom to serve the same purpose, but is not so convenient.

When the surface of the floor that is not covered by rugs is merely dusty, such a mop enables one to go over it quickly and easily. The mop should not be saturated with oil, but may be slightly moistened with floor oil or kerosene unless the floor is waxed. If it is necessary to give a floor a good oiling, another mop or woolen cloth should be used and kept especially for the purpose.

In general, varnished floors retain their color and luster better if no water is used on them, but if very dirty they may be wiped with a cloth or mop wrung out of warm soapy water, wiped dry at once, and polished with an oiled cloth or mop.

Waxed floors should be swept with a soft brush or mop entirely free from oil. Oil softens wax and should never be used on it in any way. When a waxed floor becomes dull and grimy it should be given a more thorough cleaning with a cloth wrung out of warm soapy water or, better still, moistened with turpentine or gasoline. Both turpentine and gasoline are very inflammable, however, and should not be used in a room where there is an open flame of any kind. After the waxed floor is cleaned, rub on a new thin coating of wax and polish with a weighted brush or a woolen cloth.

Oiled floors should be swept with a soft brush and dusted with an oiled cloth or mop. They may be cleaned occasionally with a cloth wrung out of warm soapy water and then polished with a cloth moistened with kerosene or a good floor oil. Excess of oil should be avoided. Water and soap should be used very sparingly on oiled floors. Similar treatment is used for painted floors.

Home-Grown Vitamins

When you lay out your garden this spring be sure to allow for plenty of fresh vegetables for the table during the summer, as well as some for canning and some to store for winter use. Two vegetables other than potatoes should be served every day, according to nutrition specialists, to supply an abundance of vitamins in the diet. A salad of raw vegetables or lettuce and fruit may be counted as one of these vegetables, and if taken in addition to the other two vegetables suggested it increases still further the chance that sufficient vitamins are being provided.

Plant the garden with one eye on the menus. Certain crops like snap beans,

(Continued on page 45)

The "kitchen garden"

Hawaiian Reclamation Project on the Island of Molokai

During the past four years 116 families have been located on the island. Plans are now under way to organize a cooperative association to market farm products

By E. E. Faville, Chairman, Agricultural Committee, and member Land Settlement Committee, Portland Chamber of Commerce, Portland, Oreg.

DURING a recent visit to the Hawaiian Islands, America's western frontier, the writer upon the invitation of Gov. Wallace Farrington, visited the island of Molokai to study at first hand the reclamation project now being carried on under the direction of the "Hawaiian Homes Commission."

The object of the Hawaiian rehabilitation act of 1920 was to put back on the land the Hawaiian and part Hawaiian people whose forbears were agriculturists in the period prior to annexation.

The Hawaiian people have been gradually drifting into the cities, many living in tenements far removed from their natural environment. Upon the passage of the act the commission's funds, derived from Territorial land, leases, and water licenses, became available and were ample to make a start.

Farm home of William Aki, resident on the project three years, showing crop of alfalfa

DOCTOR MEAD INVESTIGATES PROJECT

Upon the invitation of the commission, Dr. Elwood Mead, then at the head of the Land Settlement Bureau of California, was invited to make an investigation of the proposed project. Doctor Mead after a careful survey made many helpful recommendations, among them a reduction in the size of farms and careful selection of settlers for the settlement of lands. These last two suggestions have been adhered to by the commission.

Each homestead tract is not less than 20 acres nor more than 80 acres. These tracts are leased for a term of 99 years at a rental of $1 per acre. The settler is privileged to borrow from the commission up to a limit of $3,000 for purchase of farm equipment, stock, and to build a house. The interest rate is 5 per cent and payments distributed over a period of 30 years. The requirement is that the homesteader must live on the land, pay his taxes, and be a producer. The aim of the whole plan is for the government to help the settler to help himself.

Mr. Rudolph Duncan, secretary and manager, is a Hawaiian who has exercised good judgment in the selection of settlers. Before applicants are granted leases they are required to answer a list of questions, then they are personally interviewed, and those chosen who give promise of success.

On the island of Molokai during the past four years 116 families have been located, carrying a population of approximately 700 persons.

CONTENTED SETTLERS

In company with Secretary Duncan, Farm Advisor Roland Gay and Dr. W. T. Pope, horticulturist of the United States Experimental Station, the writer visited the project and noted its progress.

The large tract known as the Palaau and Hoolehua district is where dry-land farming is practiced with water piped to each house for domestic purposes. This land is a rich producing area. Here are located 74 farm allotments upon which are found contented settlers. A community center has been arranged with a good school of several rooms and a large community playground for athletic sports, affording an opportunity for get-together meetings, the aim being to remove any thought of isolation. Good roads and fences are provided. A community pasture of 10,000 acres is set aside for stock raisers; in fact, the government is doing everything possible to guide the settlers along the right lines on these one-family farms.

Reclamation Project Women and Their Interests

(Continued from page 44.)

lettuce, peas, and spinach can be planted at intervals throughout the season, and consequently they will seldom be missing from the family table after the first crop has matured. A number of crops can be given a start of 10 days to three weeks if the seeds are planted in a window box or "flat." Tomatoes, cabbage, peppers, egg-plant, cauliflower, and lettuce can thus be started early.

A small garden is not hard to take care of if it is carefully planned on paper before it is set out. On the farm a good-sized space can sometimes be devoted to what is usually known as the "farm" or "kitchen garden." A garden planted in long narrow rows is easiest to cultivate. One long row may have several different vegetables planted in it.

Plant only such vegetables as will yield good returns for the table in proportion to the space they occupy if available ground is limited. Potatoes, corn, cucumbers, melons, and peas require considerable space. Lettuce, spinach, beets, carrots, snap beans, or tomatoes are more economical of space and therefore adapted to growing in a small area.

The individual tastes of the family will, of course, determine largely what is to be planted in the garden. All of the green-leaf vegetables, such as spinach, cabbage, kale, beet greens, and lettuce, are rich in vitamins. Carrots, rutabagas, tomatoes, and string beans are also excellent. All vegetables furnish minerals and roughage as well as vitamins, and so are important in the diet of most persons.

David Kaai and pen of swine, Kalanianaole settlement

We visited and talked with many settlers who have been on the land for over two years. We found contented farm folks enthusiastic and willing to work. In no single instance did we find dissatisfaction. A case in point—Mitchell Panole, a young shoe clerk in Honolulu, could not make ends meet with a family of four children. After two years' residence on a 40-acre tract this young man said: "I knew nothing about farming when I came here. I am getting ahead growing vegetables, swine, and poultry. I am paying off some of my indebtedness and am making real progress." He is one of many who gave like testimony.

Adjoining this tract the commission is putting out a 500-acre pineapple plantation where it will be possible to give employment to settlers in the future, assisting them in carrying on their payments on their farms, and give employment to members of their families.

COOPERATIVE ORGANIZATIONS

Plans are now under way to organize a cooperative marketing association to market farm products. The Hawaiian settler is rapidly learning the importance of cooperative effort.

Few leases have been canceled since the opening of the lands, and these have been quickly taken up by new settlers awaiting the opportunity of being selected.

In the Kalanianaole district near Kaunakaki are 22 farms and 18 house lots. Here irrigation is provided and 10 crops of alfalfa produced annually. The farms average about 10 acres. Substantial houses are provided, many of the houses being built by the farmers who were mechanics or carpenters before becoming farmers. Swine and alfalfa have proved most profitable, and there is a ready sale for alfalfa hay.

The work accomplished in the rehabilitation on the island of Molokai is worthy of the highest encomiums. The taking of city dwellers, inexperienced in agricultural pursuits, and helping them to help themselves is most unique. The management is efficient. The growth has been slow but sure and it has not been a boom program. At present there are over 700 applications to be considered. Plans are under way to provide irrigation to the dry-land farmers. It will come because the plan is feasible and its development will be businesslike.

Those of Hawaii backing this movement to assist worthy Hawaiians back to the soil, thereby dignifying labor through ownership, are building better than is generally realized a rehabilitation program that challenges the admiration of the nation.

Acid Phosphate Helps Growth of Alfalfa

Marked improvement in the growth of alfalfa followed the application of acid phosphate in tests conducted by the United States Department of Agriculture on the Yuma project, Arizona-California. The experiments were undertaken to determine the cause of the decline in yields of alfalfa hay and alfalfa seed, crops which from the beginning have constituted the backbone of the farming industry on the project.

In the course of the tests barnyard manure alone did not show sufficient benefit to justify paying much for it. Neither gypsum nor sulphur had an appreciable effect on yields. Sulphur combined with acid phosphate gave a somewhat larger yield, though considerably less than the same quantity of acid phosphate applied alone. The use of acid phosphate tends to decrease soil acidity.

The foundation and framework of a cooperative marketing organization are to aid those producers who have united or who may unite in the enterprise to conduct it along sound and successful business lines.

One of the cardinal principles in a cooperative association is that the voting shall be on the basis of members, whereas in the case of the commercial corporation the voting is on the basis of money—each shareholder having as many votes as he has shares of stock.

Whalen diversion dam, North Platte project, Nebraska-Wyoming

Contract Between United States and Pathfinder Irrig tion District

THE Pathfinder Irrigation District includes within its boundaries about 111,000 acres of irrigable lands which receive their water supply from the irrigation works constructed by the United States for the interstate division of the North Platte project, Nebraska-Wyoming, of which area approximately 106,000 acres are covered by water-right applications and approximately 5,000 acres of irrigable land are not covered by water-right applications.

A contract, effective July 31, 1926, has been entered into between the United States and the district under the provisions of section 4 of the act of Congress approved December 5, 1924 (43 Stat. 672).

The individual water-right applications filed by the landowners and entrymen under the various public notices applicable constituted contracts between such landowners and entrymen and the United States, hence it was necessary for such application landowners to execute an instrument agreeing to abrogate their water-right applications and accept the terms of the contract. Those who executed the instrument became consenting application landowners and those who did not became nonconsenting application landowners.

REPAYMENT PROVISIONS

The district assumes and agrees to pay to the United States the total construction charges as follows: (Item 1) The total as of the effective date of the contract of the unpaid construction indebtedness (including interest and penalties as determined by the Secretary) to the United States of all the consenting application landowners; (item 2) the amounts of operation and maintenance charges (including interest and penalties) funded upon consenting application land under subsection L of the act of Congress of December 5, 1924; (item 3) the consenting application landowners ratable proportion of the book value of equipment and supplies transferred to the district under the terms of the contract; (item 4) the total of the unpaid construction indebtedness, including interest and penalties, of all the nonconsenting application land owners; (item 5) the construction charge at the rate of $71 per acre upon the irrigable acreage of nonapplication land (as determined by the Secretary) the district is to assume a primary obligation to make payment of the unpaid construction indebtedness of all nonconsenting application landowners only if said landowners fail to make payment. The payment of the construction charges by the district to the United States shall continue until it has been fully repaid to the United States.

The district will act as fiscal agent of the United States for the collection of construction charges hereafter due the United States from the nonconsenting application landowners, landowners having land under water-right application in the interstate division of the North Platte project, but not included within the boundaries of the district, whether such land lies in the State of Nebraska or in the State of Wyoming. As fiscal agent of the United States the district will also collect the charges hereafter due the United States from the Pleasant Valley Lateral Association and the Lingle Water Users' Association. The district, as fiscal agent, is constituted by the United States the assignee of any power possessed by the United States to enforce the collection of charges.

CROP REPA YMENT BASIS

In addition to the payments to be made as fiscal agent, the district will pay to the United States each year a construction charge which will be determined by multiplying the average rate per acre by the total number of irrigable acres of (1) consenting application lands and (2) nonapplication lands subject to construction charges as said total number of acres is determined and announced annually by the Secretary. The average rate per acre to be used in determining the annual construction payment to be made to the United States will be 5 per cent of the average gross annual acre income of the area of (1) irrigable consenting application land and (2) irrigable nonapplication land in cultivation in the district for the 10 calendar years first preceding the announcement of the average rate per acre by the Secretary. All findings by the Secretary as to the average rate per acre and the irrigable area subject to construction charges are conclusive. In announcing to the district the total number of irrigable acres upon which construction charges are to be collected the Secretary will omit any acreage which at tax sale on account of, among other charges, delinquent assessments made by the district to carry out the contract has failed to sell for a price sufficient to pay the taxes due thereon, and said acreage will not thereafter for a period of three years be included in said total number of irrigable acres or for such period longer than three years, as to the Secretary may appear advisable. The total acreage upon which construction charges shall be assessed by the district is never to be reduced below 80,000 acres.

The total sums due each year from the district to the United States (exclusive of the amounts which the district is to collect as fiscal agent of the United States) are general obligations of the district, and the district will each year levy assessments sufficient to pay the same in full to the United States, together with any deficiencies established by tax sales.

The district is required to purchase at tax sales any lands upon which the taxes shall become delinquent or purchase the tax certificate from the county in case the county holds the same and in accordance with the law of the State of Nebraska foreclose the tax lien. If at the foreclosure sale the net amount received is insufficient to pay the charges due the United States, the district in its next assessment will include an additional levy to meet such deficiencies.

No water shall be delivered to the district when it is more than 12 months delinquent in the payment of any construction or operation and maintenance installment which the district has agreed to pay from assessments levied upon district land.

The nonconsenting landowners will have his lands continued upon the basis of the terms embodied in his existing contract and shall not be entitled to any of the benefits of this contract nor the release of any liens reserved in favor of the United States.

All the benefits of the contract are conditioned upon payment by the landowner of the assessments levied by the district against his tract of land, and if for any reason the landowner fails to make such payments he shall revert to the obligations and terms of payment provided for in his existing contract with the United States and the district shall, as fiscal agent for the United States, collect such charges from him.

OPERATION OF WORKS

The operation and maintenance of certain of the works built for irrigation of the lands of the North Platte project is retained by the United States. Included in such works are the Pathfinder reservoir, the Guernsey Dam and power plant, the Whalen Diversion Dam, the Lingle power plant and transmission lines, the Interstate Canal from its head to station 2, and the headquarters buildings at Mitchell, Nebr.

Effective July 31, 1926, the care, operation, and maintenance of the works built for irrigating the lands of the interstate division of the North Platte project were transferred to the district.

The district is obligated to deliver water to all the lands within the bound-

(Continued on page 48)

Organization Activities and Project Visitors

COMMISSIONER MEAD was in New York February 14 and 15 to address the New York farmers on the subject of reconstruction of rural life, illustrated with motion pictures of scenes on the reclamation projects.

Andrew W. Simonds has been appointed an assistant engineer in the Denver office.

Emmett R. Crocker, associate engineer, formerly on the Umatilla project and on secondary investigations, has been reinstated for assignment to the designing section of the Denver office.

The representatives of the Bureau of Reclamation, the Indian Office, and private irrigation projects, comprising Porter J. Preston, L. M. Holt, and R. S. Carberry, appointed by the Secretary to study and report on operation and maintenance methods and costs, completed their report in the Denver office the latter part of January.

Julian A. Buendia and Procopio Eleazar, engineers from the Philippine Islands, were recent visitors at Stony Gorge Dam, Orland project.

District Counsel W. J. Burke spent some time in the Washington office on legal matters connected with the projects in his district.

A. N. Talcott, locating engineer of the Chicago & North Western Railway visited the Belle Fourche project recently to confer on matters relating to the beet spur to Vale.

C. C. Elder, assistant engineer, assisted by M. P. Trossello, continued stream gaugings, evaporation measurements, and ground-water observations in the middle Rio Grande Valley between Embudo and San Marcial.

Col. B. F. Fly, who has been seriously ill in Washington, D. C., has again taken up his duties in behalf of the Yuma project after an absence from the Washington office of about three weeks.

W. S. Post, consulting engineer for the East Bay Utilities District of Oakland, Calif., was a recent visitor on the Orland project.

Henry H. Plumb, engineer from the Denver office, spent several days on the Boise project in connection with construction details at Black Canyon power plant and proposed construction at Vale. He also visited the Minidoka project to confer upon the work in progress at the Minidoka power house.

Doctor Mead, P. W. Dent, George C. Kreutzer, W. F. Kubach, and H. A. Brown left the Washington office for the Denver conference about the middle of March. From there Doctor Mead will visit several points in the West, leaving on March 30, accompanied by Mr. Brown, for the Pan-Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation to be held at Honolulu, Hawaii, April 11 to 16. On his return, about the end of April, Doctor Mead will visit several points in the Northwest.

H. W. Lawler, general superintendent of the Utah Construction Co., was a recent visitor at Gibson dam site, Sun River project.

Kirk Bryan, geologist of the United States Geological Survey, has been making a geological examination of Avalon Reservoir, Carlsbad project.

Among recent visitors to the Klamath project were E. F. Benson, agricultural development agent of the Northern Pacific Railway, and H. Lloyd Miller, of Sunnyside, Wash.

Harry Rowe, division freight and passenger agent of the Chicago, Milwaukee & St. Paul Railway, was on the Kittitas division of the Yakima project to discuss freight rates on sand and gravel.

Contract with Pathfinder Irrigation District

(Continued from page 47)

aries of the interstate division whether such lands are in the district or not. For lands not included in the district the operation and maintenance charge as announced by the Secretary will be collected by the district as fiscal agent for the United States. The obligation of the district to deliver water is to be carried out in accordance with the reclamation law, and the rules and regulations of the Secretary. Each tract of land receiving water through the transferred works is required to pay the operation and maintenance charge in advance, and water will not be delivered until such has been paid.

The cost incurred in operating and maintaining the works reserved by the United States will be furnished to the district and it will pay to the United States the consenting land's proportionate part of such cost.

All books and records that the Secretary may require will be kept by the district and the same shall be open to inspection by the United States.

CROP CENSUS

An annual crop census and investigation of the acre income may be made under the direction of the Secretary for the purpose of checking the records furnished by the district. The Secretary may require that information concerning the crops and income produced on the lands under the transferred works be given under oath and in the event of refusal to so give any information the person refusing shall be refused water delivery.

The superintendent employed by the district is to be satisfactory to the United States and should he prove unsatisfactory the district will upon notice from the Secretary discharge him.

The United States reserves the right to inspect the transferred works to see that they are being properly cared for, the cost of such inspection to be paid for by the district. No substantial changes in the transferred works are to be made without the consent of the Secretary. If the district should fail to keep the transferred works in good condition, the United States may make the necessary repairs and charge the cost to the district. In case of a breach of any of the terms of the contract the United States reserves the right upon one year's written notice to terminate the contract and to take over the transferred works.

The execution of the contract was authorized by the electors of the district at a special election and the contract confirmed by the district court in and for Scotts Bluff County, Nebr.

U. S. GOVERNMENT PRINTING OFFICE

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards**, Assistant Secretary; **E. O. Patterson**, Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary; **J. H. McNeely**, Assistant to the Secretary; **W. B. Acker**, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — George C. Kreutzer, Director of Reclamation Economics — P. W. Dent, Assistant to the Commissioner

W. F. Kuhach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Dehler, Hydrographic Engineer; **L. N. McClellan**, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walher	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Sieheneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chahot	E. E. Chahot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	A. W. Walker	G. B. Snow	Miss E. M. Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr		L. H. Mong	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	American Falls, Idaho	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [9]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale		H. W. Bashore			B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	M. J. Gorman	E. M. Philehaum	R. J. Coffey	Berkeley, Calif.

Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks [10]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [10]	Chas. Klingman	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [11]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam	Augusta, Mont	Ralph Lowry [11]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [11]	C. B. Funk		R. J. Coffey	Berkeley, Calif.

[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on April 1, 1926.

[2] Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.

[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916

[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.

[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.

[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.

[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.

[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.

[9] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.

[10] Resident engineer.

[11] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise	Boise, Idaho	R. J. Newell	
Middle Rio Grande	Denver, Colo	I. E. Houk	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.
Yakima project extensions	Yakima, Wash	J. L. Lytel	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.

Leveling Land on an Irrigation Project

I 27. 5:1927

Clemson College Library

NEW RECLAMATION ERA

VOL. 18 APRIL, 1927 NO. 4

PREPARING FOR THE SUMMER CROP ON THE GRAND VALLEY PROJECT

Clemson College Library
Government Publications

Conserve the Water

THE GREAT STRUCTURES of the Bureau of Reclamation were built for the purpose of storing or diverting water for agricultural purposes. Each Federal irrigation project is based upon a more or less definite water supply which may be used for irrigation purposes. There is in the West, and under most of the projects, much more land than water. Under the most extensive system of water storage and the most careful use of water, only a small portion, perhaps less than one-fifth, of the arid region may be brought under irrigation. The test of the fitness of engineering structures on the Federal irrigation projects is the quantity of water which they make available.

The wise and economical use of water must be the main concern of all interested in the development of the projects, as well as in the development of the arid and semiarid area of the country. In fact, it is not the quantity of water secured by irrigation structures that determines the area of irrigated land, but rather the manner in which the available water is used. The extent of reclamation, the character of agriculture under the ditch, and the permanence of a civilization built upon irrigation depend upon the use of irrigation water; that is, upon irrigation practice.

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 APRIL, 1927 No. 4

Interesting High Lights on the Reclamation Projects

THE State of Colorado, through the University Extension Service, has been conducting a series of experiments on the Uncompahgre project in the feeding of lambs for market. These experiments have been watched with great interest by Grand Valley project farmers who have been inspecting the pens and reviewing the results obtained.

MANY inquiries are being received in the project office of the Uncompahgre project and by the various commercial organizations relative to opportunities for obtaining farms on the project.

THE local canning plant at Delta, Uncompahgre project, has been leased by the bondholders to the Currie Canning Co., of Grand Junction. The lease covers a five-year period and insures the continued operation of the plant. It is estimated that approximately 100 carloads of beets, beans, cherries, peaches, and other products will be handled by the plant during the coming season. The operation of this plant will provide a good outlet for certain fruits and vegetables, besides giving employment to a large number of people and adding to the prosperity of the valley.

POTATO shipments continued heavy from the Minidoka project, 367 carloads being moved from the project during February.

COLLECTIONS of 1927 maintenance assessments by the Burley Irrigation District, Minidoka project, have been very encouraging. Out of a total billing of approximately $102,000, which included the charges for excess water used in 1926, about $80,000 was received in time to obtain the 5 per cent discount allowed for payment on or before March 1. Maintenance had been paid in advance on about 38,000 acres.

DURING the month 305 carloads of agricultural products were shipped from the Yuma project, valued at $361,-300, making the total value of such products shipped since the first of the year $754,200.

ONE hundred sixty acres on the Mesa division of the Yuma project are being prepared for planting this year, which will bring the total to 835 acres under development.

A STATE economic conference on the dairy and poultry industries was held recently at Fallon, Newlands project, under the auspices of the Nevada Extension Service. Several constructive talks were made and effective committee work was initiated to develop these industries on the project.

A NEW community building was dedicated recently at Fallon, Newlands project. The building cost approximately $50,000 and was financed locally through the sale of stock. Practically all the local fraternal organizations united in the successful completion of the building.

KLAMATH County's first agricultural economic conference was held recently at Klamath Falls, Oreg. From the facts and figures assembled by the different committees, potatoes, red clover, and pasture were shown to have returned the greatest profit to the growers on the Klamath project. The poultry committee report showed that Klamath County imports annually approximately 8,000 cases of eggs, which could be produced by local flocks.

APPLE prices were picking up on the Okanogan project, Winesap apples left from last year's crop being sold at about $2 a box for the best grade.

THE excellent cold-storage facilities in the Yakima Valley have made it possible to hold the greater part of the apple crop, awaiting more favorable market conditions. The indications are that the crop will be disposed of at a profit.

THREE promising applicants for farm units on the Riverton project have moved to Riverton and rented land under private irrigation with a view to taking up homesteads on the project later on if suited with the country. The number of inquiries concerning opportunities on the project has shown a market increase recently.

THERE is considerable activity in the poultry business on the Shoshone project, and a poultry marketing association is being formed which includes a portion of the Frannie division. One farmer in that division is said to have ordered 10,000 baby chicks.

THE Secretary of the Interior on March 16 decided that 95.6 per cent of the power profits should be credited to the Burley irrigation district, that rentals of grazing land should be credited to the district where the lands are located, and that the proceeds of the sale of town lots should be credited to the Minidoka irrigation district.

THE Vale community, Belle Fourche project, entertained the Belle Fourche, Newell, and Nisland commercial clubs recently to celebrate the advent of the new sugar factory and the location of a railroad line to Vale. The new plant at Belle Fourche is to be known as the Black Hills factory of the Utah-Idaho Sugar Co. Bids are being received by the Belle Fourche Commercial Club for the first sack of sugar manufactured in the new plant, and at the end of the month the bid stood at $250.

Hampshire Sheep from Orland Project vie with those from Belle Fourche

By R. C. E. Weber, Superintendent Orland Project

ON the back page of the December, 1926, NEW RECLAMATION ERA there appeared a photograph of Hampshire sheep on the Belle Fourche project. Mr. J. J. Cornwell, an Orland project water user and a reader of the ERA, upon seeing the photograph called my attention to the fact that he had, he believed, a much better looking collection of Hampshires than those shown in the photograph from Belle Fourche. I suggested to him that he secure a photograph of his sheep which I could mail to you, and after some difficulty in obtaining a photograph, he has supplied me with a picture of a portion of his drove (see outside back cover page). I was at Mr. Cornwell's place yesterday, saw his sheep; and am inclined to agree with him that they are superior to those shown in the photograph from the Belle Fourche project. At least I think that his sheep warrant mention in the ERA.

Mr. Cornwell is an architect by training, but left that profession about eight years ago to take up farming on the Orland project. He acquired a 40-acre ranch which he has developed from an unimproved condition to a place of many diversified improvements. Almonds are planted on nearly one-third of his farm. Other trees consist of prunes, apricots, figs, peaches, and olives. Eight acres are seeded to alfalfa. Mr. Cornwell practices interplanting of barley and other forage crops in his orchards and derives most of the feed for his sheep from this source.

Mr. Cornwell's Hampshires, numbering about 30, are pedigreed stock from the Stevens herd of England. The sire for his drove was obtained from the University of California farm at Davis, Calif. During 1926 his increase was 146 per cent—that is, every other ewe gave birth to twins.

Even though the Hampshire breed is primarily a mutton sheep, Mr. Cornwell reports an average of 10 pounds of wool per clipping from his herd last year. His rams command a price of $35 and $40 at weaning time.

THE Lower Yellowstone Development Association, which is sponsored by the Sidney Chamber of Commerce, assisted by the Northern Pacific and Great Northern Railroads and other interests, has employed a field man to work in Colorado, Utah, and Nebraska territory for settlers. The railroads report that their advertising campaign is getting a large number of inquiries.

Cows that freshen in the fall rank highest in average yearly production of milk and butterfat, in the cost of feed, and in income over cost of feed.

The dairyman who sells his milk to a city retail trade should have his cows freshen at all seasons of the year so as to keep up a steady, constant flow of milk.

Hay cured in the windrow or cock retains more of its leaves, thereby increasing its feeding value.

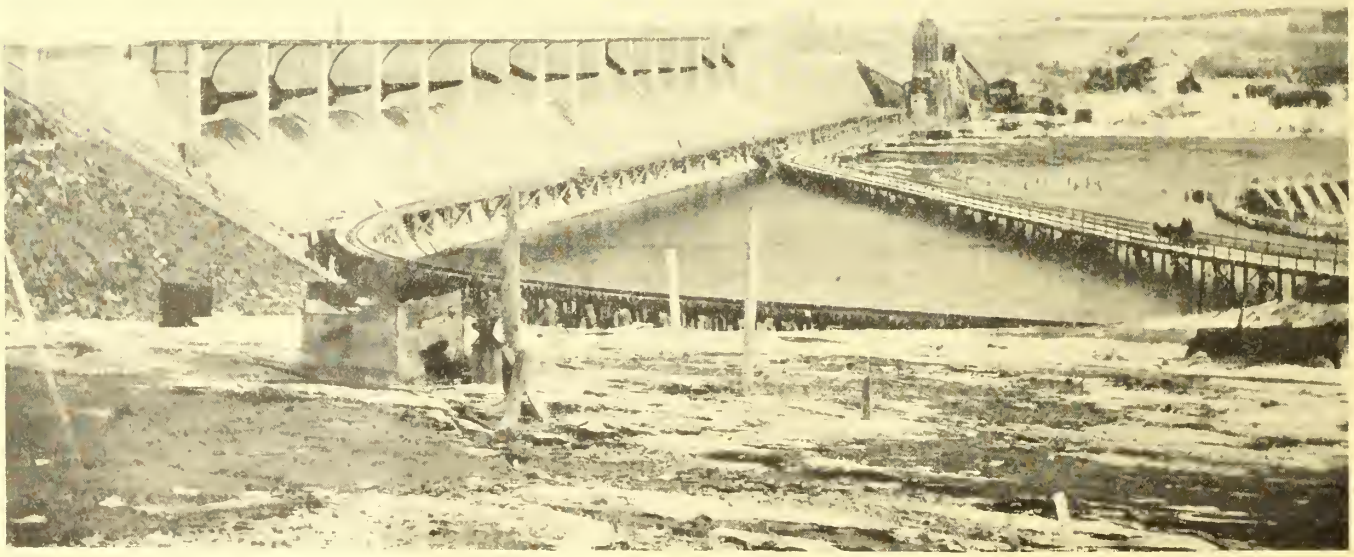
The open shed or covered barnyard is a practical method of housing dairy cows.

The open shed provides the best-known method of saving and preserving all the fertilizing constituents of the manure.

The open shed permits the feeding under shelter of roughage and makes possible its utilization for bedding.

When there is plenty of bedding, cows housed in the open shed keep cleaner than those confined in stanchions.

Only sound, healthy sweet potatoes should be selected for seed, and only from vines the stems of which are not rotted or otherwise abnormal.



American Falls Dam from West River bank

Extracts from A Résumé of the Department of the Interior

(March, 1926 to March, 1927)

IMPORTANT changes in the administration of the Department of the Interior occurred during the past year. A number of new national undertakings was developed relative to the department's activities. Public service was facilitated through the installation of improved methods in the conduct of its business.

COLORADO RIVER IMPROVEMENT

One of the foremost issues before the country is the control and development of the Colorado River.

For half a century this question has been studied by the Federal Government. For two decades it has been before Congress. No less than 55 measures have been introduced in the Senate and the House providing for various phases of the river's development.

Last year the Interior Department urged that the National Government should without delay aid in the settlement of the Colorado River problem or get out of the way of private enterprise. For the first time concrete and specific recommendations comprehending the diversified and coordinated uses of the river were made to Congress by the department.

It was proposed that the project, which provided for the construction of an immense dam at Boulder Canyon, be built through a national bond issue rather than by appropriations out of the United States Treasury. Plans for the development, as outlined, solved all the questions connected with the river. Flood control with the rescue from constant menace of 60,000 people and $60,000,000 of property in the Imperial Valley was provided for. Storage of water for the irrigation of additional desert lands and for domestic and household purposes, the all-American canal, and the manufacture of hydroelectric energy were included in the scheme. Revenues from the project, it was estimated, would redeem the entire bond issue in 50 years. Proposals by the department were immediately accepted by proponents of legislation which had been introduced in the Senate and the House.

Although no action was taken by Congress at its last session, public interest in the development of the Colorado River has been aroused. The project has become a question of vital concern to the Nation as a whole. The harnessing of an international stream to prevent floods and the general prosperity of the southwestern section of the United States are involved.

FEDERAL RECLAMATION

Relief for farmers on Federal irrigation projects became an accomplished fact. Through the enactment of legislation by Congress approximately $27,500,000 of their obligations were charged off or suspended as a loss to the Government. This sum represented construction costs of works built for the irrigation of worthless lands, including engineering errors, failure of water supply, and other unreturnable expenditures.

Other revisions in national policies dealing with Federal reclamation were effected. Under authority of Congress local management and operation of projects by the farmers was inaugurated, supplanting long-distance and hired supervision by the Federal Government. A plan of selecting settlers with the necessary qualifications to assure success after they had taken up farms on the projects was adopted. Boards of examiners were appointed to examine applicants for irrigated farms under Federal canals.

In the past it has been the custom to grant extension of time to water-users when their construction charges fell due. This practice was stopped by the department. It was urged upon Congress that further suspension of these repayments would have the effect of nullifying the reclamation law and menacing the future success of reclamation.

For the first time a tentative 10-year construction program for the completion of all existing Government projects was presented to Congress. Estimated expenditures amounted to $95,514,000. Under this program, 22 unfinished projects in 17 Western States would be completed by the end of 1927, should Congress approve it.

RURAL DEVELOPMENT IN SOUTH

A new national policy was developed relative to the reclaiming of neglected and abandoned lands in Southern States. Congress authorized the expenditure of $100,000 for this purpose. Six typical tracts of land were selected in the South which, if reclaimed, would provide farms and homes for more than 100 families.

In cooperation with State governments a special committee of advisers was selected outside of the Government service by the department. This committee in company with the Commissioner of Reclamation made a trip of inspection and study into conditions affecting the development of these areas.

The report of these special advisers is the first comprehensive discussion of the agricultural, social, and economic problems of the South. As a result the proposed reclamation of neglected and abandoned lands is gaining impetus. Success of this movement does not depend on the physical rejuvenation of the land. This must be supplemented by organized farming communities properly equipped and united in cooperative organizations for the solution of both economic and social problems.

Leading citizens of the South have become interested in this national question. Since the investigation by the special advisers, eight States have joined in forming an organization to promote the movement. Expenditures out of the Federal Treasury are not contemplated in the reclaiming and settlement of these neglected lands. The actual undertaking of the work is to be done by State and private activity.

Payment of Flood Damages

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is authorized and directed (1) to cause a survey to be made in such manner and under such regulations as he deems necessary for the purposes of this act to determine the property loss by flood by reason of the overflow of the Rio Grande River on August 17, 1921, sustained by Lucas Trujillo, Juan Bians, Mariano P. Padillo, Bruno Perea, Juan Jose Trujillo, Miguel Trujillo, Francisco Saiz, Antonio Provencio, B. R. Carreros, Santiago Serna, Roman M. Herrera, and other property owners who are citizens of the United States residing at or in the vicinity of Hatch and Santa Teresa, New Mexico; and (2) to pay such losses in full if the amount appropriated in section 2 of this act is sufficient or, if such amount is insufficient, to pay to each person such percentage of the amount of his property loss as the amount appropriated bears to the amount determined by the Secretary as the property loss sustained.

SEC. 2. There is hereby authorized to be appropriated, out of any money in the reclamation fund of the Treasury the sum of $75,000 or so much thereof as may be necessary for the purposes of this act.

Approved, February 25, 1927. (Private, No. 396.)

Stony Gorge Dam, Orland Project, California

By Byrum W. Steele

The Stony Gorge Dam, now under construction on the Orland project in California, will be of reinforced concrete. It will have an overall length of about 900 feet and a maximum height above the stream bed of about 120 feet. It will be of the Ambursen type, the essential features of which are an impervious inclined upstream face designed as a flat slab and supported by concrete buttresses. The upstream face is placed at an angle of approximately 45° with the horizontal so that the weight of the water impounded and lying above the dam adds to its stability. The general plan, elevation, and sections of the dam are shown on the drawing on opposite page.

The contract for the construction of the dam, bids for which under specifications No. 449 were received on August 18, 1926, has been awarded to the Ambursen Construction Co. of New York and San Francisco. This dam is located on Stony Creek about 40 miles southwest of the town of Orland. Stony Creek, at the north end of the reservoir site, swings westward, cutting through a low range of hills which owe their existence to the occurrence of a series of sandstones and shales. Where Stony Creek breaks through this ridge is marked by a fault line, running parallel to the creek, the presence of which is largely responsible for the type of dam which has been selected.

The floor of the reservoir area is largely of impervious shale, the bedding planes of the shales and sandstones being tipped about 60° off the horizontal and toward the east. Thus the floor of the reservoir area and the dam site are rendered highly impervious to water as the seepage from the reservoir must travel perpendicular to the bedding planes except at the upper and lower extremities of the reservoir.

Various types of dams were considered for this location and the Ambursen was finally chosen as the type best adapted to withstand settlement or movement along the line of the fault. A multiple arch would probably cost a little less to build, but owing to spillway complications and the fact that any settlement or movement might prove disastrous, it was decided to discard the multiple arch type.

Spillway capacity for a flood of 30,000 second-feet is provided by three 30 by 30 feet stony gates which are mounted on the upstream face of the dam. These gates are of the overflow type and are operated by means of stems connected to electrically operated hoists located in the spillway gate house on the top of the dam.

The outlets for irrigation water are located on the north side of the creek and are controlled by one 10-inch and two 42-inch balanced needle valves. The 42-inch valves are supplemented by high pressure emergency gates 3 feet 6 inches square, the emergency gates and balanced valves being connected by 50-inch riveted steel pipe. The gates, pipes, and valves are located between buttresses. The 10-inch needle valve is located between buttresses No. 35 and 36, receives its water supply through the same trash rack as the 42-inch valves, and discharges into an 18-inch pipe leading to the south side of the river at the intake of the Angle-Troxel Ditch, for which service this valve is provided.

The truck haul on all materials shipped in is approximately 8 miles, Fruto being the terminus of the Southern Pacific branch from Willows on the main line.

It will require approximately 1,500,000 pounds of reinforcing steel for the concrete reinforcement. The buttresses are reinforced with rail steel, while the face slab and corbels are reinforced with billet steel. The majority of the reinforcement bars are cut to lengths and the bending done at the mill.

Concrete materials to be used for the dam have been tested in the laboratory of the Bureau of Standards at Denver and at the field laboratory established at the dam site, which is equipped to test the field specimens of concrete as the work progresses. Cobble rock 6 inches or less in diameter will be used in the concrete for cut-off trenches, buttress footings, and buttresses below elevation 774.0. In the buttresses above this elevation the maximum size of the coarse aggregate is limited to 3 inches diameter and in the face slab which is heavily reinforced the maximum size of coarse aggregate is limited to 1¾ inches in diameter. Sand will be measured by the inundation method, and gravel will be measured by means of batchers equipped with strike-off devices.

Power for lighting the dam and operating the spillway and high pressure emergency gates will be developed through batteries and a trickle charger from a small generator connected to a 15-inch pelton water wheel. A gas engine will be provided for use when the reservoir is too low to operate the pelton wheel.

It is proposed to drill grout holes about 5 feet apart in the upstream cut-off after the excavation has been completed, and this area will then be grouted to render it impervious to water under reservoir head. It is expected that considerable grouting will be necessary in the area surrounding the line of fault in order to cut off possible seepage from the reservoir floor.

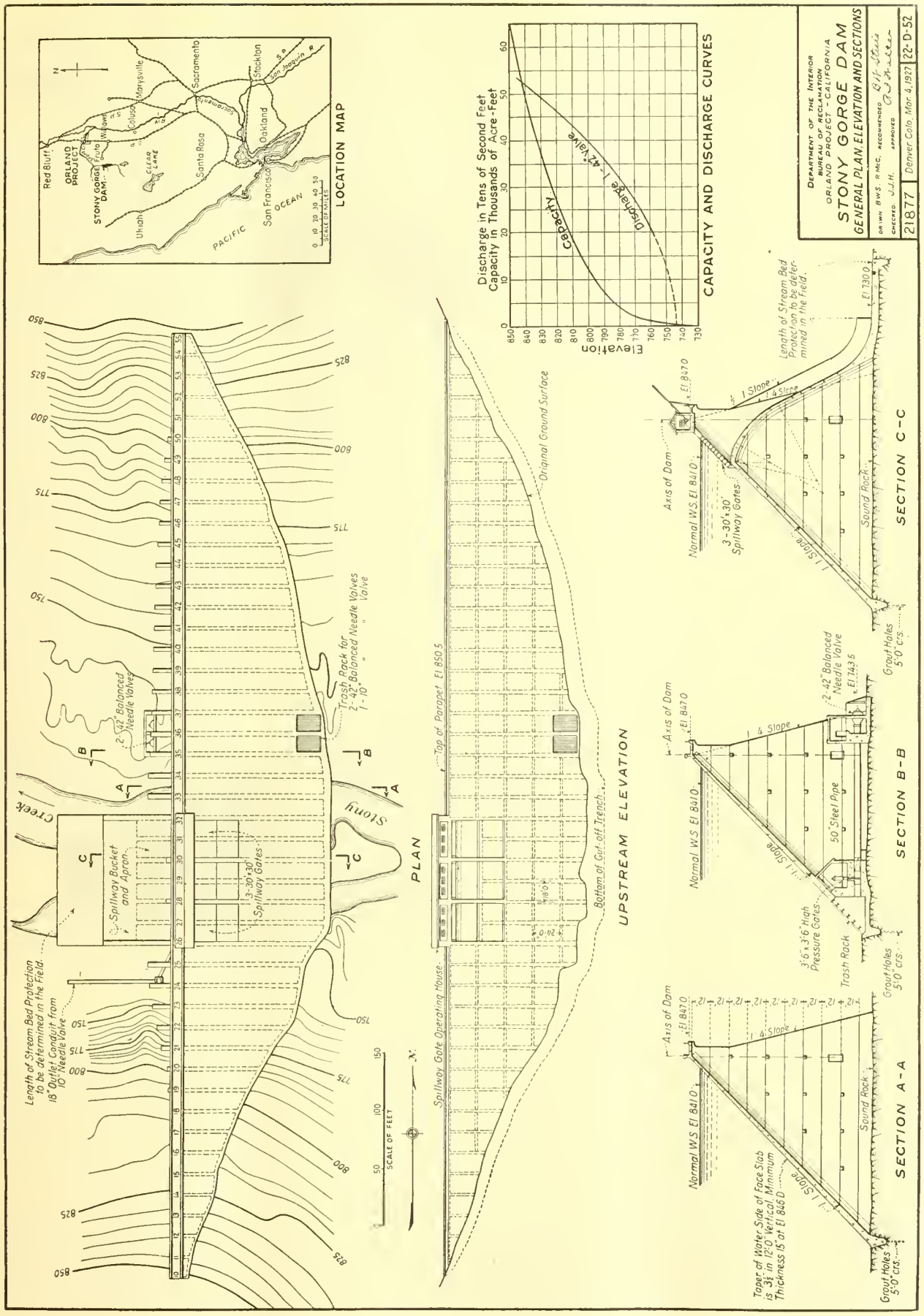
Excavation for the buttress footings and upstream cut-off was started about the 1st of January, 1927, but it is not probable that any concrete will be poured before May, 1927.

Diversification Will Keep Farmers Busy

The following editorial is from the Yakima Daily Republic of February 11:

"Henry Ford is said to have made up his mind that he will show American farmers that if they will adopt efficiency methods they can get along with less than a month's work in a year. That will depend on what kind of a farm the flivver man undertakes to demonstrate. No doubt there are many specialty or one-crop farms in the country which can be worked and handled in less than a month of actual time; where diversification is practiced and where the farm is a home as well as a factory the man who occupies it can keep himself busy for 365¼ tolerably long days, year in and year out. It is a fact of no little consequence, however, that the farmers who think they have a claim on the Government for relief are, as a rule, those engaged in producing specialty crops. No other kind of business could be made to pay in the short time they devote to production. Fundamentally, what the Government is being urged to do in connection with the proposed relief legislation is to assist a manufacturer who has a plant that he prefers not to keep running all the time, and who is in straightened circumstances mainly because he won't use his factory up to capacity."

There is no reason in the world why dairying should ever be conducted at a loss on any dairy farm over any considerable period of time.



(See opposite page)

Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

Pointers on Carving

Some men like their wives to carve, and others won't let them attempt it. Some like to carve standing up and some believe it is a breach of etiquette to do so Common sense decides the matter in most households, for much depends on who is considered the best carver, the length of his or her effective reach, the height of the chair usually occupied, the tenderness of the meat or poultry to be carved, the sharpness of the knife, and the previous experience of the carver.

Above all things the carving knife should be sharp. It should be of the best size for the kind of meat to be carved—the small, light type for chicken or steak, and the larger, heavier size for roasts. Carving must be quickly done, before the meat has a chance to chill, and a sharp knife is an aid to speed as well as to the appearance of the food. Good carving results in neatly severed joints, flesh cut across the grain, thin appetizing slices or portions, dispensed so that everyone at the table has at least a bit of the choicer cuts and no one is left with only the undesirable parts.

The illustration shows how to carve a leg of lamb. Notice that the fleshiest side of the meat is uppermost and that the carver steadies the roast with the carving fork held in her left hand, while she slices *across the muscle* at right angles to the leg bone. Cutting the meat parallel to the bone, as one often sees it done, results in stringy portions, difficult to chew. A ham, smoked or fresh, is carved in the same way as a leg of lamb. Thin slices are to be preferred for all of these meats.

A rib roast of beef is carved horizontally—that is, across the grain. A standing roast of beef is placed with the ends of the ribs to the left of the carver. The butcher in trimming the roast should remove any bone at the upper or right-hand end that is likely to interfere with carving. The meat is sliced very thinly across the grain until the knife reaches the bone. When several slices have been cut the point of the knife is run along the edge of the bone to separate the slices from the ribs.

The first step in carving a steak with a T-bone is to trim this bone out. The steak is then cut into sections about an inch wide, beginning at the upper or broad end and cutting at right angles to the former position of the bone, through both tenderloin and large portion. In this way both tenderloin and ordinary steak are served to each person.

Carve lamb across the grain at right angles to the bone

A rib roast of pork is generally "cracked" with a cleaver by the butcher so that each chop can be carved separately.

A shoulder of lamb presents more difficulty in carving than almost any piece of meat, because of the irregular position of the various bones. If the shoulder blade is removed by the butcher and the cavity stuffed the problem is simplified. The lines of the chops can be followed as far as they go.

The art of carving poultry varies with each kind of bird. The skillful carver is the one who knows exactly where to find the joints. In carving most poultry it is well to remove the leg and wing from one side first so as to slice the breast conveniently. The leg of a large bird may be cut into two or more pieces.

Upholstered furniture may be given a beating indoors if covered with a cloth which has been dipped in water and wrung as dry as possible. Use a flat beater. The damp cloth takes up the dust.

Poke Shoots and Other Spring Greens

Do you know poke shoots, or poke salad as they are sometimes called? Perhaps as a child you made "ink" from the dark purple berries of the poke weed and stained your hands and clothes and were warned by your parents of the poison in the juice. It is true that the berries of the poke weed are poisonous and should never be tasted or eaten. The tender pink and green shoots of the poke weed that come up in the spring contain none of this poisonous matter, however, and are highly prized for greens in many localities. Some people call them poor man's asparagus. They do have the same kind of succulent texture and fresh earthy flavor. You may be able to find the poke weed growing wild in a nearby field or perhaps in a corner of your garden. In cutting the shoots you will find the small pink ones best, but you may also take the tips of the half-grown stalks. Do not use the larger green leaves for they will be bitter. In cutting the shoots take care not to include any of the underground part of the plant for the root is exceedingly poisonous. Also be sure that you are cutting the true poke weed. There is one variety sometimes called Indian poke which is poisonous in all its parts.

If poke weed does not grow wild in your locality, perhaps marsh marigold or cowslip does. That makes the best of all greens, some people think. With others lamb's quarters or wild dandelion is the favorite. You may have in your garden an abundance of turnip or mustard tops, young beet greens, kale, spinach, or perhaps so much lettuce that you can use it for cooked greens. Try the poke shoots, however, if they are available. They go particularly well with ham.

Poke shoots have a slightly pungent or bitter flavor which is disliked if too strong. It is customary, therefore, to cook them for 3 or 4 minutes in boiling water as you would any other vegetable, and then drain them and put them on to cook again in fresh boiling water, lightly salted. Young poke shoots are fairly uniform in size and are handled more easily if they are tied together in a bundle like asparagus. Poke shoots are best if seasoned simply with butter, and like asparagus may be served on toast.

If mustard, turnip, lamb's quarters, marsh marigold, or beet tops are used instead of poke they are chopped finely and cooked the shortest possible time in very little water. A hard-boiled egg may be used to give a decorative note and add to the food value, or if you have an abundance of garden lettuce, shred it, stir it up with melted butter in a heavy skillet, cover, let it steam and cook slowly for 4 to 10 minutes, and sprinkle lightly with salt before serving. Romaine lettuce is especially good for cooking, because it holds its shape and does not wilt down so completely as the softer kinds of garden lettuce.

Leather furniture coverings look better and last longer if they are rubbed occasionally with castor oil. This restores to the leather the oil that gradually dries out. The oil should be well rubbed in and any excess wiped off the surface, or it will collect and hold dirt which will darken the leather, and soil whatever touches it.

Water Supply for Irrigation

Winter precipitation to date in the western mountain regions has generally been near normal or above, with unusually heavy packing of snow, so that favorable stream flows may be expected far into the coming irrigation season. With the exception of the Okanogan project, an ample irrigation supply is assured for all Federal projects. The American Falls and McKay Reservoirs, now nearing completion, will receive sufficient water to fill them if desired. Heavy snowfall in some localities, particularly in the Sierra-Nevada region, may result in moderate floods. Average conditions prevail generally in the Colorado River drainage basin, but on account of the insecure flood control situation at the head of Imperial Valley such average conditions for flood run-off are menacing.

ON condition that 4,000 acres of sugar beets are grown in the area tributary to the Burley factory, Minidoka project, and 4,000 acres in the Paul factory area, the Amalgamated Sugar Co. will pay a bonus at harvest time of 50 cents a ton, which when added to the base price of $7.50 per ton previously agreed upon will allow the farmers $8 a ton, with the privilege of participating in such further bonuses as the price of sugar may justify.

A. C. Cooley, in charge of demonstrations on Federal reclamation projects, was on the Minidoka project recently to attend the Burley Economic Conference.

An acre of asparagus, Yuma project

Contracts With Irrigation Districts, Boise Project

THE following contracts have been executed on the Boise project, Idaho, with irrigation districts taking over operation and maintenance, and receiving the benefits of the act of Congress of December 5, 1924 (43 Stat. 672), by which the water users on the Boise project will be enabled to pay the construction charges on a crop return basis: Contract with the Nampa and Meridian Irrigation District dated March 2, 1926; contract with Black Canyon Irrigation District dated April 21, 1926; contract with Boise-Kuna Irrigation District dated March 20, 1926; contract with Wilder Irrigation District dated April 6, 1926; and contract with Big Bend Irrigation District dated March 25, 1926.

These contracts follow generally the same pattern, and that with the Nampa and Meridian Irrigation District will be described, as typical of the whole.

The Nampa and Meridian irrigation district comprises within its boundaries about 40,000 acres of irrigable lands receiving their entire water supply from the irrigation works constructed by the United States, and about 24,500 acres of old water-right land, of which all but approximately 2,000 acres is irrigated from the Ridenbaugh Canal owned and operated by the district. By contract dated June 1, 1915, and amended November 15, 1918, the district had purchased from the United States water rights for the 40,000 acres of project land, at an agreed price of $70 per acre, payable in 20 annual installments. In the same contracts the district had purchased supplementary stored water rights for the old water-right lands of the district. By previous contracts the district had also taken over the operation and maintenance of the part of the project system within the district.

The act of December 5, 1924, permitted the payment of construction charges on a crop return basis; that is, the individual water user instead of paying his proportionate part of the project construction charges in 20 years as required by the act of Congress of August 13, 1914 (36 Stat. 686), was to be permitted to make payment of the construction charge in an indeterminate period of years, depending upon the crop returns from the land, as ascertained by the Secretary of the Interior. Each year 5 per cent of the gross crop return is payable to the United States. Subdivisions (a), (b), and (c) of article 5 of the contract are quoted in full, so as to show in detail the method fixed for the payment of the construction charges on a crop return basis:

CONSTRUCTION PAYMENTS 5 PER CENT AVERAGE GROSS ACRE INCOME

(*a*) The installment of the construction charge per irrigable acre of project lands in the district payable each year shall be 5 per cent of the average gross annual acre income (as determined by the Secretary) for the 10 calendar years first preceding the year in which such installment comes due of the area of project land in cultivation in the district as found by the Secretary annually. The decision of the Secretary as to any such installments shall be conclusive.

DISTRICT LANDS AVERAGE GROSS ACRE INCOME

(*b*) The Secretary will determine the average gross acre income from said lands for the 10 years preceding the year 1925, and will notify the district of his findings thereon, and of the charge per irrigable acre based on 5 per cent of the said average gross acre income, and it is agreed that the annual construction installments for the project lands of the district shall be on the basis of the said rate per irrigable acre as determined by the Secretary multiplied by the number of irrigable acres as said irrigable acreage is shown on the official farm unit plats on the Boise project, until modified by notice from the Secretary of his findings in regard to average gross acre income for said project lands of the district during future years, and the district will pay each year to the United States (in addition to the payments provided for in article 11 hereof) as the construction charge on account of the said project lands of the district a sum determined by multiplying the rate per acre determined in the manner stated above by the total number of irrigable acres of project lands in the district (except lands described in article 11 hereof), which charges shall be assessed accordingly by the district to the project lands therein. Said annual payments shall continue until the full construction charge of $70 per irrigable acre of project lands in the district, plus any amounts added thereto on account of interest or penalties and any amounts added thereto under subsection L of section 4 of said act of December 5, 1924, on account of any due and unpaid construction or operation and maintenance charges added to the total obligation as provided in said subsection and other items provided for under articles 9 and 10 hereof have been fully paid by the district to the United States.

FUTURE ANNOUNCEMENTS AFFECTING CONSTRUCTION PAYMENTS

(*c*) After the close of each year hereafter the Secretary will notify the district in writing of his findings in regard to the average gross acre income for the project lands of the district for that year, and the average for the 10-year period including such year and the 9 preceding years unless the Secretary shall find the average gross acre income for such year to be so near the average last determined as to make no material difference in the rate previously determined, in which event the rate last determined and stated by the Secretary shall continue. The failure of the Secretary to state his findings in regard to the average gross acre income for any future year will be construed as equivalent to a finding by the Secretary that the average gross acre income for such year is the same as the average of the last preceding 10 years and that the rate last stated will continue.

The contract authorizes the delinquent charges, the operation and maintenance charges for the current year, and the cost of operation and maintenance equipment transferred to the district to be added to the construction charge and paid as a part of same. Any landowner objecting to the change in terms of payment is to be permitted to remain subject to the old terms of payment.

An important part of this contract is that constituting and dealing with the board of control. It was necessary for the districts operating on the Boise project to set up some sort of machinery by which they could jointly manage certain project facilities serving more than one district. For this purpose the district contracts provide in considerable detail for a board of control comprised of representatives from the various districts.

THE following paragraph appearing in the April issue of the Reclamation Record 10 years ago is worthy of repetition:

"Marshall Field is said to have won his phenomenal success by remembering but 12 essential business principles: The value of time, the success of perseverance, the pleasure of working, the dignity of simplicity, the worth of character, the power of kindness, the influence of example, the obligation of duty, the wisdom of economy, the virtue of patience, the improvement of talent, and the joy of originating."

Agricultural Program for Rio Grande Federal Irrigation Project

Recommendations of economic conference show cotton to be key to situation, and other enterprises are to be developed with this in mind

L. H. Hauter, Assistant Director of Extension, New Mexico College of Agriculture and Mechanic Arts

FARMERS of the Rio Grande Federal irrigation project met at State College, New Mexico, February 15–16, and at El Paso, Tex., on February 18–19, to decide on a definite agricultural program for the next five years. The program was decided upon after the 13 committees which had been appointed by the farm bureaus had carefully reviewed a mass of data on production, prices, and markets which had been compiled for their consideration.

Guernseys in alfalfa, Rio Grande project

COTTON KEY TO SITUATION

It developed early in the conference that cotton production would be the key to the situation, and all committees were kept in close touch with the recommendations that were being developed by the cotton and miscellaneous cash crops committee. Cotton, which occupied less than 1 per cent of the total crop acreage on the project in 1919, made up 65 per cent of the total acreage in 1925 and 1926, changing the entire cropping system of the project in less than six years. It became quite evident that the production of any crop, whether a cash or feed crop, could be encouraged only after carefully considering the relative profitableness of such a crop in comparison with cotton, and also after considering the effect that any cropping system might have on soil fertility.

The cotton committee decided, after carefully reviewing all data available, that while the price outlook for the coming year was not encouraging that the farmers on the project could conservatively organize their business on the basis of expecting an average of 15 cents per pound for middling cotton after the surplus crop had been absorbed. They recommended that on this basis cotton should be the major cash crop, but that the soil fertility problem should not be overlooked. They also called attention to the importance of making the project a "one strain of one variety" area in order to secure the premium for the cotton that it deserves.

Sugar beets, broomcorn, tobacco, and flax were all passed up as offering no encouragement for the immediate future or as requiring further experimentation before definite recommendations could be made.

INCREASE IN FEED CROPS

It was pointed out that alfalfa, which a few years ago was the principal cash crop, had ceased to be a surplus crop during the past two years and that only about one-fourth of the grain consumed on the project in 1926 was home grown. Although there appeared to be no increase in the hay requirements of southeastern Texas (the principal market for project hay), it was definitely recommended that sufficient alfalfa be produced to feed all farm animals and that at least one year out of four cotton land be in alfalfa. It was felt that the latter recommendation was desirable from the standpoint of crop rotation. It was also recommended that only the best grades of alfalfa be sold and other grades be consumed on the farm. Cooperative marketing and Federal inspection were also to be encouraged.

Corn was considered the most satisfactory grain and fodder crop, and it was recommended that each farmer produce all the corn for grain, fodder, and silage that is needed for his own farm, but that corn should be grown as a cash crop only when the farmer can expect a yield of 50 to 55 bushels per acre. The small grains were not encouraged except for farm needs for feed and pasture.

FEED PRICES HIGH FOR LIVESTOCK PRODUCTION

The livestock committees were unable to give much encouragement to increased livestock production on the project due to the shortage of and high price of feeds. It was recommended, however, that sufficient hogs be produced for farm consumption and that there be some increase beyond this looking toward supplying the local markets. Attention was called to the fact that hogs could be farrowed in February and placed on the market in August and September when receipts are low and prices are high, thus giving an advantage which partially offsets the high price of feed.

The feeding of cattle and sheep on an extensive scale could not be recommended on the present outlook for feeds and stock. However, the farm flock of sheep was to be given some encouragement and some feeding was suggested to utilize waste feeds.

Milk production has been on the whole-milk basis, and it was not felt that milk could be profitably produced at a butter-fat basis unless there should be a material reduction in feed costs.

Poultry producers are also faced with high feed costs. The poultry committee felt that eggs could be profitably produced only on the basis of quality eggs which bring a premium. Since the quality egg market in El Paso appears to be fairly well saturated, the committee recommended that the feasibility of shipping quality eggs to eastern markets

be investigated since climatic conditions for production of eggs during the high price season are very favorable. However, until it has been definitely demonstrated that this was feasible, the committee did not feel that they could recommend any increase in poultry production since they did not feel that project producers could compete with ordinary farm or storage eggs shipped in from cheap grain areas.

LIMITED EXPANSE IN FRUITS AND VEGETABLES

Because of an increased production of winter apples throughout the United States, the committee did not recommend any increase in the winter varieties but indicated a field for limited expansion in early summer and fall varieties. No increase in peach production was recommended although a limited increase in the pear and grape production of the lower part of the project was recommended.

In the case of truck crops, it was indicated that immediate expansion should be with those crops that have established themselves on the market and are making good returns to the grower. Some increase in the cabbage, tomato, and cantaloupe production was recommended, provided we secure rigid inspection so that only good quality products are shipped.

The possibility of developing a mixed car vegetable business on the project was especially stressed by the committee. It was pointed out that there are hundreds of towns that are eating very few vegetables because they are not available in small lots and they are unable to use an entire car of one vegetable. Many vegetables produce well on the project and can be placed on the market when the demand is good, so with the proper marketing facilities truck production on the project might be materially increased on this basis. The desirability of establishing several small canneries on the project to take care of the local market demands was also stressed.

Water Users Power Plant Wins Praise

Much of the electric current which has supplied light and power in Yuma during the period of the recent storm came from the water users' power plant at Siphon drop. At times this plant carried the entire Yuma load when the southern Sierras was out of business on account of storm interruptions. Current was available when needed and service was good. The new power plant is a great asset to the Yuma project.

LAND AND CREDIT REQUIREMENTS

Although tenancy on the project has increased materially since 1920, it is pointed out that most of the tenants are endeavoring to make homes and are not detrimental to the best interests of the project. In fact, it was recommended that prospective purchasers rent land for a year before purchase is made, and that preferably the first purchase be small. It was recommended that before purchasing land the farmer should have at least 50 per cent of the purchase price of land, livestock, and equipment if he is to farm efficiently. Greater use of Federal farm loans and Federal intermediate credit loans was suggested, the latter to be secured through the cooperative marketing association. Contracting farm products for the purpose of borrowing money was condemned because of the high cost of such credit.

HORSE PREFERRED TO TRACTOR

After reviewing the relative costs of horse and tractor labor, the horse and tractor committee favored the use of horses in general on farms of the project.

* * * * *

The conference, which proved highly successful, was suggested by A. C. Cooley, agriculturist in charge of demonstrations on reclamation projects, last November, and was decided upon after the matter had been discussed with a number of farm leaders on the project. In view of the fact that the project is located in two States, the New Mexico College of Agriculture and Mechanic Arts and the Texas College of Agriculture and Mechanic Arts cooperated in compiling the information necessary for the various committees. Valuable assistance was also given by L. M. Lawson, superintendent of the Rio Grande Federal irrigation project, who furnished much valuable information, and by the various department workers who assisted in compiling the data reviewed by the various committees before making their recommendations.

A full report of the committees of recommendations along with some of the information used in reaching their conclusions will be issued in bulletin form at an early date.

Cotton 2½ months old

Cotton Production on Irrigation Projects

Statistics compiled by the Bureau of Reclamation, Department of the Interior, show that last year cotton was grown on nearly 210,000 acres on five Federal irrigation projects in the States of California, Arizona, New Mexico, and Texas, producing 166,000 bales of 500 pounds each, and 160,000,000 pounds of seed valued as a whole at $13,764,585, or $65.59 an acre.

The largest area devoted to the crop, amounting to 83,337 acres, was on the Rio Grande project, New Mexico and Texas. The largest production, amounting to 31,317,200 pounds of lint and

62,634,400 pounds of seed, came from the Salt River project in Arizona, which also had the highest total value of the crop, amounting to nearly $6,000,000, and the highest value per acre, amounting to $74.46. These yields and total value were followed closely by the Rio Grande project, New Mexico and Texas, although the per acre value of the crop was nearly $12 less. Long-staple cotton was grown on the Salt River project on 18,686 acres. Complete statistics are given in the accompanying table.

Cotton grown on Federal irrigation projects, 1926

Project	Acreage	Unit of yield	Yields				Value	
			Total		Average per acre		Total	Per acre
			Lint	Seed	Lint	Seed		
Salt River	79,465	Pound	31,317,200	62,634,400	394	788	$5,916,841	74.46
Yuma	29,155	do	12,545,672	25,091,344	430	860	1,656,032	56.80
Orland	279	do	36,000	72,000	129	258	15,187	54.43
Carlsbad	17,615	do	6,378,840	17,234,000	362	978	967,113	54.90
Rio Grande	83,337	do	32,680,800	55,376,000	392	664	5,209,412	62.51
Total	209,851		82,958,512	160,407,744	395	764	13,764,585	65.59

Land Settlement in Italy

THE Roman Campagna is a large domain in close proximity to Rome, Italy, and represents an area much larger than many provinces of the Kingdom. Its development and settlement have engaged the attention of the Italian Government for a number of years.

The first sanitary improvement law was passed in 1878, and provided particularly for the drainage of marshes and pools, the linking up of springs, and the agricultural improvement of a belt of land within a radius of about 6 miles from the center of Rome. In 1883 reclamation was declared compulsory on all owners of land within the belt described, and if owners were unwilling or unable to meet the requirements of this act, the penalty of expropriation was imposed. In 1903 provision was made for financing improvement schemes for which the owners themselves were responsible. Loans were made by the Government for this purpose bearing 5 per cent interest and repayable in 50 years. This and later legislation brought 110,000 acres under compulsory reclamation. From 1910 to the beginning of the World War, villages and centers of agricultural settlements were established. Such centers contained not less than 25 families, so that domestic water, sanitation measures, schools, and other community improvements could be carried out. New settlers were provided with land by the Government by expropriation proceedings.

FINANCIAL AID TO SETTLERS

Following the war more comprehensive measures were adopted to intensively settle the Campagna. A large number of villages were established and settlers were granted not to exceed 37½ acres (15 hectares) of land. To accomplish this special loans were granted for the construction or repair of houses, farm buildings, and farm roads, and to supply water for irrigation or domestic use or for any other work of permanent land improvement or transformation. Loans were made to landowners on development plans submitted by themselves, examined and approved by the Government authorities. The interest on these loans is 2½ per cent, and they are repayable in 45 years. From 1907 to 1924 loans aggregating more than $22,000,000 were approved. At the present time the Government is empowered to grant loans of not exceeding $6,000,000 annually.

This development supplies Rome with fresh dairy products, vegetables, and fruits, and provides homes for a vast number of agricultural workers.

Within recent years this form of credit has provided electricity for pumping and for other home uses, and also has provided large modern machinery for breaking up sod land and subsoiling. These community enterprises add to the efficiency of the small landowner and give him the enjoyment of modern conveniences.

LARGE AREA UNDER DEVELOPMENT

The extension of development and settlement of the Roman Campagna has been carried on successively until it includes 470,000 acres of land. Consideration has been given to extending this development to include Pontine marshes which would bring the total area of planned development and settlement up to 770,000 acres.

An idea of how intensively this development is carried out and the amount of money required to establish settlers may be had from the figures given on 146 farm holdings made available by expropriating in 1922. They were granted to settlers at actual cost at an average of $240 an acre and provision was made for loans up to

Furrow irrigation

$400 an acre to facilitate farm development and the establishment of settlers on the land.

The original 110,000 acres have been divided and resubdivided until now they comprise 4,655 separate holdings. This is an average of about 23 acres per farm. In this domain are about 200 tracts having areas from 65 acres to 1,125 acres which are being cut up under a vigorous closer settlement policy in which long-time credit and a low rate of interest encourage farm development. The division of the Government entrusted with this important work renders a high type of public service by providing rural education, sanitation, community organization, and all other factors necessary to promote agricultural prosperity and the contentment of the tiller of the soil.

Agents Show Proper Mixing of Bordeaux for Potatoes

PROPER mixing of Bordeaux has almost as much to do with its effectiveness as the amounts of the constituents used, and has much more to do with the ease of application, according to a recent press release from the Department of Agriculture. In order that potato growers may get better results with this spraying material, county agents in many localities have been giving mixing demonstrations, in which the results of different ways of combining the lime and copper sulphate were shown on a small scale in glass jars, the same proportions being used as in actual practice.

Bordeaux mixture for diseases and insect enemies of potatoes, as recommended by the United States Department of Agriculture, is made up of 5 pounds of copper sulphate (blue vitriol) and 5 pounds of freshly burned lime in 50 gallons of water. The copper sulphate is dissolved and the lime slaked separately and then the two are mixed. Putting the two materials together in concentrated form at once materially affects the physical properties of the spraying mixture. Improper mixing also causes difficulties in spraying.

Copper sulphate dissolves best if put into a bag and suspended in water. In making the lime milk a little hot water should be poured on first until the lime becomes active and then cold water is added slowly as the lime slakes until a fairly thin white liquid results. In mixing the lime milk and the copper sulphate solution at least one of them should be fairly dilute. In making up the final mixture in small amounts the solution of copper sulphate should be poured into the lime milk. If the process is reversed a thick, heavy sediment is formed which will not pass readily through the spraying machine nozzle.

At the demonstrations many potato growers found that they had been mixing the wrong way and decided to change their methods.

Report on Sacramento Valley Project

PLANS for an irrigation project embracing a gross area of 277,000 acres in the Sacramento Valley in California have just been presented in a report to the Bureau of Reclamation by Engineer W. R. Young.

The project would include the construction of the Iron Canyon storage dam 152 feet high near Red Bluff, Calif., and a main canal some 120 miles in length extending from a division dam just below Red Bluff to a point about 16 miles south of Colusa. Except for a 7,000-acre tract east of the river near Red Bluff the irrigable area stretches along the foothills of the Coast Range west of the Sacramento River in Tehama, Glenn, and Colusa Counties for an air-line distance of about 100 miles, with an average width of 4½ miles.

The investigation on which this report is based was undertaken by the Bureau of Reclamation in cooperation with the State of California and the Sacramento Valley Development Association. Construction of a storage dam at the Iron Canyon site was proposed in 1920 in connection with a high-line irrigation canal planned to divert water directly from the reservoir. On account of the high cost per acre estimated for this development, further studies of a low-line canal with incidental power development were urged, resulting in the present report.

The water supply for the project would be derived from the 10,000 square miles of Sacramento River watershed above the reservoir site. The dam as planned would be a concrete structure raising the water surface 152 feet above low-water level and impounding 1,121,900 acre-feet of water, sufficient to cover the 60 square miles of land area in the District of Columbia to a depth of 29 feet. This water when released from the reservoir would pass through the turbines of a 110,000-horsepower hydroelectric plant to be built at the foot of the dam, generating electrical energy to be sold for irrigation pumping and for power and lighting purposes throughout the lower Sacramento Valley. It is estimated that the returns from the sale of this power would return the investment in reservoir and power plant within 20 years, besides providing a surplus which might be applied to repaying the cost of the main canal and distribution system. The total estimated cost of the project is $56,000,000.

The above estimates are based on the assumption of interest-free money being available in the reclamation fund to be appropriated for this work. As a matter of fact, all the accretions to the reclamation fund for a number of years to come will be required to maintain economical progress on projects already authorized and now under way. With the notable falling off now being experienced in receipts from the public land oil leases, the principal source of income for the reclamation fund in recent years, and the deferment of construction repayments authorized by recent legislation, only a comparatively small amount of money is available for Federal reclamation work, and this will all be absorbed in carrying on construction work already initiated.

Land Settlement in New South Wales

More than 8,000,000 acres of land had been assigned to returned soldiers by the States of New South Wales up to June 30, 1926, and a total of £17,850,000 had been expended either in advances for improvements or for carrying out projects for irrigation or other public works designed to increase the value of such lands. Under the terms of the returned soldiers' act, 9,265 men had received land or assistance, and, of this number, 2,334 transferred, surrendered, or forfeited their holdings. Of the £3,043,436 advanced in money, £859,699 had been repaid on account and principal and an additional £294,649 had been paid on interest account. Repayments of interest and principal were slower during 1925–26 than in the preceding year, but it is thought that the liberal terms granted for repayment of the remaining indebtedness will make it possible for all paymnets to be made as they fall due. (Sydney Morning Herald.)

Reclamation Appropriation Act for the Fiscal Year 1928

Approved January 12, 1927

THE following sums are appropriated out of the special fund in the Treasury of the United States created by the act of June 17, 1902, and therein designated "the reclamation fund," to be available immediately:

Commissioner of Reclamation, $10,000; and other personal services in the District of Columbia in accordance with "The classification act of 1923," $142,000; for office expenses in the District of Columbia, $23,000; in all, $175,000;

For expenses, except membership fees, of attendance upon meetings of technical and professional societies required in connection with official work of the bureau, $2,000;

For all expenditures authorized by the act of June 17, 1902 (32 Stats. 388), and acts amendatory thereof or supplementary thereto, known as the reclamation law, and all other acts under which expenditures from said fund are authorized, including not to exceed $160,000 for personal services and $25,000 for other expenses in the office of the chief engineer, $25,000 for telegraph, telephone, and other communication service, $8,000 for photographing and making photographic prints, $50,000 for personal services, and $10,000 for other expenses in the field legal offices; examination of estimates for appropriations in the field; refunds of overcollections and deposits for other purposes; not to exceed $20,000 for lithographing, engraving, printing, and binding; purchase of ice; purchase of rubber boots for official use by employees; maintenance and operation of horse-drawn and motor-propelled passenger-carrying vehicles; not to exceed $50,000 for purchase of horse-drawn and motor-propelled passenger-carrying vehicles; packing, crating, and transportation (including drayage) of personal effects of employees upon permanent change of station, under regulations to be prescribed by the Secretary of the Interior; payment of damages caused to the owners of lands or other private property of any kind by reason of the operations of the United States, its officers or employees, in the survey, construction, operation, or maintenance of irrigation works, and which may be compromised by agreement between the claimant and the Secretary of the Interior, or such officers as he may designate; payment for official telephone service in the field hereafter incurred in case of official telephones installed in private houses when authorized under regulations established by the Secretary of the Interior: *Provided*, That no part of said appropriations may be used for maintenance of headquarters for the Bureau of Reclamation outside the District of Columbia except for the office of the chief engineer: *Provided further*, That the Secretary of the Interior in his administration of the Bureau of Reclamation is authorized to contract for medical attention and service for employees and to make necessary pay roll deductions agreed to by the employees therefor: *Provided further*, That any moneys which may have been heretofore or may be hereafter advanced for operation and maintenance of any project or any division of a project shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which advanced in like manner as if said funds had been specifically appropriated for said purposes: *Provided further*, That no part of any sum provided for in this act for operation and maintenance of any project or division of a project by the Bureau of Reclamation shall be used for the irrigation of any lands within the boundaries of an irrigation district which has contracted with the Bureau of Reclamation and which is in arrears for more than twelve months in the payment of any charges due the United States, and no part of any sum provided for in this act for such purpose shall be used for the irrigation of any lands which have contracted with the Bureau of Reclamation and which are in arrears for more than twelve months in the payment of any charges due from said lands to the United States;

Examination and inspection of projects: For examination of accounts and inspection of the works of various projects and divisions of projects operated and maintained by irrigation districts or water-users' associations, $20,000;

Yuma project, Arizona-California: For operation and maintenance, $358,000; for continuation of construction of drainage, $35,000; in all, $393,000; *Provided*, That the unexpended balance of $35,000 of the appropriation of $200,000 for the Yuma auxiliary project, contained in the second deficiency act, fiscal year 1925 (Forty-third Statutes at Large, page 1330), is hereby reappropriated and made available for the same purposes for the fiscal year 1928;

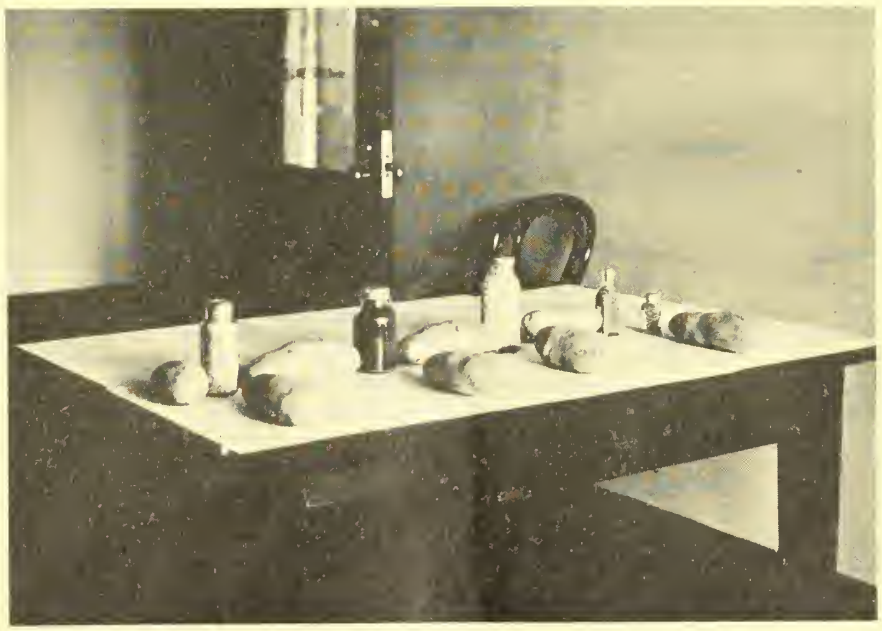
Orland project, California: For operation and maintenance, $35,000; continuation of construction of Stony Gorge Reservoir, $605,000; in all, $640,000;

Grand Valley project, Colorado: For operation and maintenance, $50,000; continuation of construction, $30,000; in all, $80,000;

Uncompahgre project, Colorado: For operation and maintenance, $145,000;

Boise project, Idaho: For continuation of investigation and construction, Payette division, $400,000: *Provided*, That of the unexpended balance of the appropriation

(Continued on p. 62)



Spuds and various seeds grown on Minidoka project

White Leghorns grown on a Yuma ranch

for this project for the fiscal year 1927 there is reappropriated for operation and maintenance, Payette division, $16,000; for investigations, examination and surveys, Payette division, $16,000; for continuation of construction, Arrowrock division, $100,000;

Minidoka project, Idaho: For operation and maintenance, reserved works, $71,000; continuation of construction, $75,000; in all, $146,000;

Minidoka project, American Falls Reservoir, Idaho: For operation and maintenance, American Falls water system, $9,000; for acquiring rights of way, $8,000; construction of power plant, $700,000; investigation and construction of gravity extension unit, $400,000: *Provided*, That none of the said sum of $400,000 shall be available for construction work until a contract or contracts shall be made with an irrigation district or districts embracing said unit which, in addition to other conditions required by law, shall require repayment of construction costs as to such lands as may be furnished supplemental water, within a period not exceeding twenty years from the date water shall be available for delivery; in all, $1,117,000;

Huntley project, Montana: Not to exceed $60,000 of the unexpended balance of the appropriation of $118,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, page 1166), and heretofore made available for the fiscal year 1927, shall remain available for the fiscal year 1928;

Milk River project, Montana: For operation and maintenance, $36,800; continuation of construction, $15,000; in all, $51,800;

Sun River project, Montana: For operation and maintenance, $20,000; continuation of construction, Greenfields division, $37,000; continuation of construction, Gibson Dam, $1,000,000; in all, $1,057,000;

Lower Yellowstone project, Montana-North Dakota: For continuation of construction of drainage system, $100,000;

North Platte project, Nebraska-Wyoming: For operation and maintenance of reserved works, $75,000; continuation of construction of Guernsey Dam, $200,000; in all, $275,000: *Provided*, That of the unexpended balance of the appropriation for this project for the fiscal year 1927 there is reappropriated for continuation of construction of the Guernsey power plant, $150,000; and for continuation of construction of drainage, $100,000; in all, $250,000;

Newlands project, Nevada: For operation and maintenance, $125,000; continuation of construction, $64,000; in all, $189,000: *Provided*, That no part of this amount shall be available for the reconstruction of the Truckee Canal unless a contract in form approved by the Secretary of the Interior shall have been made with the Truckee-Carson irrigation district providing for the payment of the reconstruction cost: *Provided further*, That the appropriation of $245,000 made available by the Act of June 5, 1924 (Forty-third Statutes, page 415), and reappropriated for the fiscal year 1926 by the act of March 3, 1925 (Forty-third Statutes, page 1167), shall remain available for the fiscal year 1928 for use for drainage purposes, but only after execution by the Truckee-Carson irrigation district of an appropriate reimbursement contract satisfactory in form to the Secretary of the Interior and confirmation of such contract by decree of a court of competent jurisdiction and final decision on all appeals from such decree;

For the survey and examination of water storage reservoir sites on the headwaters of the Truckee River, investigation of dam sites at such storage reservoirs, examination and survey of lands susceptible of irrigation from waters that may be practicably so impounded, and estimates of costs, reports, and recommendations with regard thereto, $50,000;

Carlsbad project, New Mexico: For operation and maintenance, $50,000;

Rio Grande project, New Mexico-Texas: For operation and maintenance, $350,000; continuation of construction, $400,000; in all, $750,000;

Owyhee project, Oregon: For continued investigations and commencement or continuation of construction, $2,000,000;

Umatilla project, Oregon: For operation and maintenance of reserved works, $10,000 of the unexpended balance of the appropriation for this project for the fiscal year 1927 shall remain available for the fiscal year 1928;

Baker project, Oregon: For commencement of construction, $450,000;

Vale project, Oregon: For continuation of construction, $850,000, of which amount not more than $100,000 shall be available for the purchase of a proportionate interest in the existing storage reservoir of the Warm Springs project, and the unexpended balance of the appropriation for the fiscal year 1927 shall remain available for the fiscal year 1928;

Klamath project, Oregon-California: Of the unexpended balance of the appropriation for this project for the fiscal year 1927 there is reappropriated for operation and maintenance, $102,000; continuation of construction, $124,000; in all, $226,000;

Belle Fourche project, South Dakota: For continuation of construction of drainage, $125,000: *Provided*, That no part of this amount shall be available unless a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or districts organized under State law providing for payment of construction and operation and maintenance charges by such district or districts;

Salt Lake Basin project, Utah, first division: For continued investigations, construction of Echo Reservoir, Utah Lake control and Weber-Provo Canal, the unexpended balance of any appropriation available for these purposes for the fiscal year 1927 shall be available during the fiscal year 1928;

Okanogan project, Washington: For operation and maintenance, $65,000;

Yakima project, Washington: For operation and maintenance, $288,000;

Yakima project (Kittitas division), Washington: For continuation of construction and operation and maintenance, $2,000,000;

Riverton project, Wyoming: For operation and maintenance, $55,000;

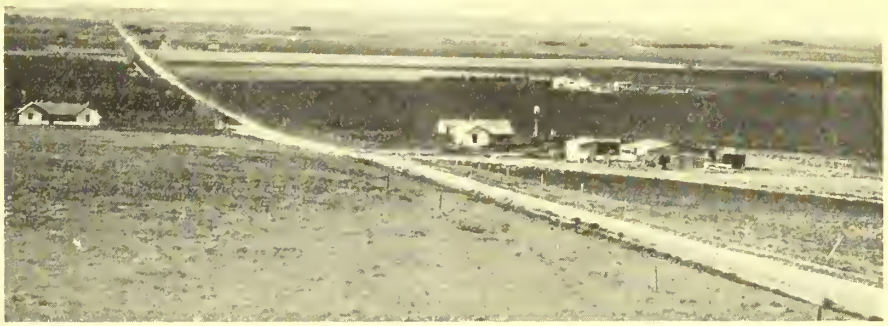
Shoshone project, Wyoming: For continuation of construction of drainage, Garland division, $150,000: *Provided*, That of the unexpended balance of the appropriation for this project for the fiscal year 1927 there is reappropriated for operation and maintenance of the Frannie division, $12,500; of the Willwood division, $10,000; and of the power plant, $15,000; in all, $37,500: *Provided further*, That the expenditures in the fiscal year 1928 for operation and maintenance of the Willwood division shall in no case exceed $20,000, including advances by water users;

Secondary projects: For cooperative and general investigations, $75,000;

For investigations necessary to determine the economic conditions and financial feasibility of new projects and for investigations and other activities relating to the reorganization, settlement of lands, and financial adjustments of existing projects, including examination of soils, classification of land, land-settlement activities, including advertising in newspapers and other publications, and obtaining general economic and settlement data, $100,000: *Provided*, That the expenditures from this appropriation for any reclamation project shall be considered as supplementary to the appropriation for that project and shall be accounted for and returned to the reclamation fund as other expenditures under the reclamation act;

Under the provisions of this act no greater sum shall be expended, nor shall the United States be obligated to expend, during the fiscal year 1928, on any reclamation project appropriated for herein, an amount in excess of the sum herein appropriated therefor, nor shall the whole expenditures or obligations incurred for all of such projects for the fiscal year 1928 exceed the whole amount in the "reclamation fund" for the fiscal year;

Ten per centum of the foregoing amounts shall be available interchangeably for expenditures on the reclamation projects named; but not more than 10 per centum shall be added to the amount appropriated for any one of said projects, except that should existing works or the water supply for lands under cultivation be endangered by floods or other unusual conditions an amount sufficient to make necessary emergency repairs shall become available for expenditure by further transfer of appropriation from any of said projects upon approval of the Secretary of the Interior;



Pleasant Valley, Interstate Division, North Platte project

Whenever, during the fiscal year ending June 30, 1928, the Commissioner of the Bureau of Reclamation shall find that the expenses of travel, including the local transportation of employees to and from their homes to the places where they are engaged on construction or operation and maintenance work, can be reduced thereby, he may authorize the payment of not to exceed 3 cents per mile for a motor cycle or 7 cents per mile for an automobile used for necessary official business;

Total, from reclamation fund, $11,798,800.

For the share of the Government of the United States of the costs of operating and maintaining the Colorado River front work and levee system adjacent to the Yuma Federal irrigation project in Arizona and California, as authorized by the act entitled "An act authorizing the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," approved March 3, 1925 (43 Stats. p. 1186), $35,000, or so much thereof as may be necessary, to be transferred to the reclamation fund, special fund, created by the act of June 17, 1902 (32 Stats. p. 388), and to be expended under the direction of the Secretary of the Interior in accordance with the provisions applicable to appropriations made for the fiscal year 1928 from the reclamation fund.

For investigations to be made by the Secretary of the Interior through the Bureau of Reclamation to obtain necessary information to determine how arid and semiarid, swamp, and cut-over timberlands in any of the States of the United States may be best developed, as authorized by subsection R, section 4, second deficiency act, fiscal year 1924, approved December 5, 1924 (43 Stats. p. 704), including the general objects of expenditure enumerated and permitted under the second paragraph in this act under the caption "Bureau of Reclamation," and including mileage for motor cycles and automobiles at the rates and under the conditions authorized herein in connection with the reclamation projects, $15,000.

Barry Dibble, formerly superintendent of the Minidoka project and now consulting engineer at Redlands, Calif., was a recent visitor at the Washington office.

L. E. Mayhall, general superintendent of hatcheries of the division of fisheries, State of Washington, was recently in the Ellensburg office, Kittitas division, Yakima project, to discuss revisions in the design of the proposed fishway at the diversion dam.

District Counsel E. E. Roddis spent several days on the Shoshone project principally in working out a plan for the operation of the works common to the Deaver and Shoshone irrigation districts.

Organization Activities and Project Visitors

DR. Elwood Mead stopped at Iowa City, Iowa, on his way to the Denver conference, points west, and Honolulu, to give an address before the University of Iowa on the development of the Colorado River Basin.

Chief Engineer Walter recently visited Boise, Vale, Owyhee, Gooding, Minidoka, American Falls, and Salt Lake Basin projects.

George C. Kreutzer, director of reclamation economics, made a flying trip to Hollywood, Fla., in connection with the investigation of opportunities for planned group settlement in the South.

C. A. Bissell, chief of the engineering division of the Washington office, spent several days recently looking over properties selected by the States of South Carolina and Georgia with a view to outlining a more intensive economic investigation of the properties later in the year. Mr. Bissell was recalled from the South to assume the duties of Acting Commissioner in Dr. Mead's absence.

Paul J. Leverone, formerly employed in the drafting section of the Washington office and for the past several years in the National Park Service, has resigned after 17 years in the Interior Department to enter a broader commercial field. Friends and well-wishers in the department presented Mr. Leverone with a walrus hide fitted traveling bag.

A Carlsbad apiary

A. B. Richard, ditch rider with auto on the Orland project, has resigned to devote his entire time to farming operations on his project holdings.

Among recent visitors on the Milk River project was C. D. Greenfield, agricultural development agent of the Great Northern Railway Co.

George E. Stratton, former superintendent of the Milk River project, has been transferred to the Lighthouse Service. His headquarters will be in Washington, but he will be in the field a large part of the time. His work will be in the airways division following up construction. He is now engaged on building 20 beacons from Los Angeles to Apex, Nev.

Miss Catherine Keltsch, assistant clerk, has been transferred from the Strawberry Valley project to the Denver office to fill the position formerly occupied by Miss Grace Miller.

Associate Engineer R. G. Hornberger has resigned from the service to return to his home in Cleveland, Ohio. He was employed in the Denver office.

W. C. Paul, of Rupert, Idaho, president of the Minidoka irrigation district, was a recent visitor at the Washington office. He brought with him some fine examples of various kinds of seed grown on the project and a number of big white potatoes, which were distributed among the office force after being photographed.

C. C. Ketchum and D. J. Paul, assistant engineers, have been transferred from the Boise to the Vale project. Charles G. Anderson, junior engineer, has been transferred from the Vale to the Boise project.

Skimming weir and settling basin, Fort Laramie Canal at Whalen Dam

U. S. GOVERNMENT PRINTING OFFICE

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards,** Assistant Secretary; **E. O. Patterson,** Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary; **J. H. McNeely,** Assistant to the Secretary; **W. B. Acker,** Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — George C. Kreutzer, Director of Reclamation Economics — P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; **L. N.** McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E Stoutemyer	
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	A. W. Walker		Miss E.M.Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr	H. C. Stetson	L. H. Mong	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	Adrian, Oreg	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [9]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg	H. W. Bashore			B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	M. J. Gorman	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks [10]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [10]	Chas. Klingman	L. J. Windle	Wm. J Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [11]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam	Augusta, Mont	Ralph Lowry [11]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [11]	C. B. Funk		R J. Coffey	Berkeley, Calif.

[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on April 1, 1926.
[2] Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.
[9] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.
[10] Resident engineer.
[11] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise	Boise, Idaho	R. J. Newell	
Middle Rio Grande	Denver, Colo	C. C. Elder	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.
Yakima project extensions	Yakima, Wash	J. L. Lytel	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.

HAMPSHIRE SHEEP GRAZING ON ORLAND PROJECT

(*See page 50*)

I 27.5: 1927

NEW RECLAMATION ERA

VOL. 18 MAY, 1927 NO. 5

GIBSON DAM SITE, SUN RIVER PROJECT, MONTANA

Clemson College Library
Government Publications

LET us develop the resources of our land,
Call forth its powers,
Promote all its great interests,
To see whether we also,
In our day and generation,
May not perform something to be remembered.

—*Daniel Webster.*

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 MAY, 1927 No. 5

Interesting High Lights on the Reclamation Projects

THE Farm Economic Conference for Irrigated Land was held at Sidney, Lower Yellowstone project, Montana, April 1–2, under the auspices of the State Agricultural College. Great interest was shown by the farmers, and the various commodity committees did good work in studying production costs and returns realized from the various crops. The resulting recommendations can not fail to improve the agricultural practices on the project. The results of the conference will be published in pamphlet form and made available for all water users. The project office will make a complete report in the near future.

FARMERS on the Lower Yellowstone project who held their lambs until April realized excellent returns, most of the stock being fed having gone to market.

ON the Newlands project 96 inches of well-packed snow at the Summit on March 31 gave promise of a good water supply for the coming year.

DURING the past season 12,184 cars of apples were shipped from the Yakima project.

ON the Lower Yellowstone project the operation and maintenance collections to April 1 were nearly $25,000 in excess of costs, a condition which has never before existed in the history of the project.

THE Yakima Valley Traffic & Credit Association reports that in the 1926–27 season to March 12 the Yakima Valley shipped 27,138 carloads of fruits and vegetables. Apple shipments totaled 11,765 cars; pears, 4,063; and potatoes, 6,637.

PROJECT Superintendent Lytel reports an acreage under irrigation in the Yakima Valley of 350,000, and places the value of storage properties at $3,800,000. Forty-eight thousand acres are planted to fruit. There are in the valley cold-storage facilities for 7,000 carloads of fruit. It is estimated that cold-storage construction costs an average of $500 a carload.

THIS year's crop of grapefruit on the Yuma project was about cleaned up by April 1, 1,400 field boxes having been picked during the preceding month. Sixteen cars have been shipped this season, and next year's crop will probably amount to 75 or 100 cars. New growth started during the month. All orchards seem to be in excellent condition, with a general appearance better than for the past two years.

THE Yuma Mesa reports the largest melon crop ever planted on the project, to April 1, the total acreage in watermelons being 330 and that in cantaloupes, 3,200.

DURING the month the Chicago, Burlington & Quincy Railroad Co. and the Great Western Sugar Co. held an exhibit relative to beet culture on the Shoshone project, visiting Powell on the 21st. The exhibits were excellent and greatly appreciated by a crowd estimated at 900 persons. An increased sugar-beet acreage is expected this year, and it is expected that other row crops will be increased, all at the expense of alfalfa.

TWO additional applications were received for farm units on the Riverton project during the month and three prospective applicants for homestead lands visited the project.

AT American Falls Dam it was expected that the Utah Construction Co. would complete all work under its contract and ship out all plant and equipment during April.

A CHECK-UP of new settlers on the Sun River project shows that during the past winter nine new settlers have located on the project, most of them taking land as renters, and in a few cases contracts for sale have been executed on a long term of payment with practically no initial payment being made.

A CONSIGNMENT of 30,000 pounds of fig jam, a product of the Orland Kadota Fig Preserving Plant during the 1926 season, was shipped during the month to the United States Forest Service at Missoula, Mont.

AT Gibson Dam about 5,000 cubic yards of rock were excavated in the open cut of the spillway-tunnel outlet during the month. At the end of the month the outlet portal of the spillway tunnel had been reached and preparations were being made to go underground.

ON March 1, 145 public-land farm units on the Tule Lake division of the Klamath project were opened to entry, and during the month 97 applications were received and referred to the examining board. Nearly 50 applicants were passed by the board.

THE Squire-Dingee Pickle Co. is negotiating with the city of Newell on the Belle Fourche project looking to the erection of a salting station in that city.

Report of the Reclamation Conference at Denver, Colo., March 16-18, 1927

By R. F. Walter, Chief Engineer, Bureau of Reclamation

A conference of superintendents, district counsel, and others, including several members of the staffs of the Washington and Denver offices of the Bureau of Reclamation, was held at Denver, Colo., Mar. 16–18, 1927.

The tentative program as printed on page 36 of the NEW RECLAMATION ERA for March, 1927, was followed with but few exceptions.

The conference was called to order at 9.30 a. m., March 16, by R. F. Walter, chief engineer, who stated that this was the sixth general conference of the engineers of the bureau, previous general conferences having been held at Ogden, Utah, 1903; Washington, D. C., 1905; Yuma, Ariz., 1908; Denver, Colo., 1916 and 1918. Dr. Hubert Work, Secretary of the Interior, was unable to reach Denver in time to permit his attendance at the conference, and in his absence Dr. Elwood Mead, Commissioner of Reclamation, made the introductory speech. He gave the reasons for calling this conference, among them being the fact that during the last two and one-half years important legislation has been enacted vitally affecting the bureau, such as the fact finders' and adjustment acts. These and other legislative acts have changed to a considerable extent the character of the work and have developed complex legal and economic questions. He thought that much good would be accomplished by discussion of these problems.

Following Doctor Mead's remarks the general conference adjourned for the morning and was resolved into numerous small groups whereby the engineers, legal advisers, and accountants could get together to discuss and decide what questions should be brought up at the general conference.

The general conference met again in the afternoon with Mr. Walter, chief engineer, as chairman, and the regular program for the first day, as shown in the March ERA, was followed, with the reading of additional papers by H. W. Bashore and L. M. Lawson under item 7, on the subject of "Problems of the Field."

The morning of the second day (March 17) was given over to numerous committee meetings, including the following: "Land Classification, North Platte and Minidoka projects," Messrs. Dent, Bergin, Debler, Stetson, Darlington, Kreutzer, Kubach, Burke, and Mitchell; "Surveys of Projects Requesting Extensions," Doctor Mead, and Messrs. Dent, Walter, Kreutzer, Lawson, Weber, Preston, Casteel, L. E. Foster, Lytel, Johnson, Debler, Devries, Coffey, and Offutt; "Hospital Operations," Messrs. Kubach, Bashore, Brown, Roddis, Lawson, L. R. Smith, Lytel, and others who were interested; "Special Administrative Engineering Legal or Economic Problems," which field officials desired to talk over with Washington or Denver office staff; "Special Project Accounting Problems," Messrs. Kubach, Lyman, Meyer, and L. R. Smith, with others especially interested, including Messrs. Banks, Weber, Darlington, Preston, and Youngblutt.

The general conference was resumed on the afternoon of March 17, with P. W. Dent, assistant to the commissioner, as chairman. The topics for discussion were those pertaining to legal and financial matters, and the tentative program as prepared for that day was followed with the exception that the limited time available made it necessary to dispense with the reading of the papers prepared by E. B. Darlington and P. W. Dent, subjects, "Application of Credits under Subsections I and J, Act of December 5, 1924," and "Obligations of Irrigation Districts and Water Users' Associations on Transferred Projects," respectively.

The morning of the third day (March 18) was again given over to committee meetings as follows: "Aerial Surveys, Yakima and Columbia Basin Investigations," Doctor Mead and Messrs. Walter, Lytel, Debler, and Lawson; "Exchange of Entries, Refunds, and Credits, etc.," Messrs. Dent, Kubach, Bergin, Kreutzer, Debler, Offutt, all district counsel, and all superintendents; "Baker Project" and "Kennewick and New Divisions, Yakima Project," Doctor Mead and Messrs. Walter, Lytel, Kreutzer, and M. M. Moulton, secretary of the Kennewick irrigation district; "Kittitas Appraisal," Doctor Mead and Messrs. Stoutemyer, Dent, Johnson, Young, Debler, Kreutzer, Banks, Bashore, Darlington, Offutt, Walker, and F. A. Kern, secretary of the Kittitas reclamation district.

The general program for the third day (March 18) was taken up in the afternoon with G. C. Kreutzer, director of reclamation economics, as chairman, the topics for discussion pertaining to settlement and farm development. B. E. Hayden, being engaged on important field work in Idaho, was not able to present his paper on "Appraisal and Value of Land on New Projects."

Gov. Frank C. Emerson and Senator Francis E. Warren, of Wyoming, held a conference with Commissioner Mead on March 18 to discuss the application of the town of Douglas, Wyo., for purchase of power to be developed at the hydroelectric power plant, under construction at the Guernsey Dam, and to urge inauguration of additional new irrigation projects in Wyoming. Governor Emerson and Senator Warren each spoke briefly to those attending the general conference.

The afternoon session on March 18 closed the general conference, but as none of those attending left Denver until the following day much was accomplished on March 19 by the project superintendents and others in discussing with Washington and Denver office staffs various problems concerning which they were particularly interested.

On the morning of March 19 the following committee groups met for discussion of the several subjects shown: "Land Settlement Meeting," Messrs. Kreutzer, Brown, Youngblutt, Parker, Mitchell, Comstock, Sanford, Johnson, Weber, Banks, Bashore, Stetson, Newell, Young, Lytel, and Darlington; "Uncompahgre Contract," Messrs, Dent, Walter, Debler, L. J. Foster, Alexander, Offutt, Kubach, Bergin, and representatives of water users; "Grand Valley Contract," Messrs. Dent, Walter, Debler, Page, Alexander, Offutt, Kubach, Bergin, Harper, and representatives of the water users.

Representatives of the Grand Valley Water Users Association, Grand Junction, Colo., and the Uncompahgre Water Users Association, Montrose, Colo., were in attendance to discuss the form of new repayment contracts. F. A. Kern, secretary of the Kittitas irrigation district, Washington, was present to discuss land appraisals and other matters pertaining to the Kittita division of the Yakima project. M. M. Moulton, representing the Kennewick irrigation district, Washington, urged the early construction of that project. A delegation from the San Luis Valley, Colo., discussed with the Secretary and the commissioner the need for a drainage outlet from San Luis Lake to the Rio Grande.

The gathering in Denver of such a large number of the officials of the bureau was made the occasion of several semiofficial meetings. On March 16 the Colorado Section of the American Society of Civil Engineers gave a dinner at the University

Club, at which a number of the project superintendents and others were in attendance. Doctor Mead was the principal speaker. He was followed by P. J. Preston, superintendent, Yuma project, Arizona; F. A. Banks, construction engineer, American Falls Reservoir, Idaho, and Owyhee project, Oregon; L. M. Lawson, superintendent, Rio Grande project, New Mexico-Texas; J. L. Lytel, superintendent, Yakima project, Washington; and W. R. Young, construction engineer, Kittitas division, Yakima project, Washington.

On March 18 the Denver Chamber of Commerce held a luncheon, and again Doctor Mead was the principal speaker. The climax of these semiofficial gatherings was reached on the evening of March 18, when all of the visiting officials were the guests of the Denver office employees at a banquet held in the Olin Hotel, with R. F. Walter, chief engineer, as toastmaster. Dr. Hubert Work, Secretary of the Interior, was present at this affair and gave an informal talk, stressing the solid basis on which the operations of the bureau are now being conducted. The feature event of the evening was an oratorical contest between selected representatives of the engineers and district counsel. By popular vote it was decided that the engineers outtalked the legal men, but this decision may have been influenced somewhat by the fact that the engineers greatly outnumbered the legal men present.

It is the consensus of opinion that the conference was of untold benefit to the service as a whole. There is no question but what the morale of the organization has been strengthened and increased by personal contact. It is believed the results that may be expected as a sequence to this conference, will more than repay the cost thereof, and it was freely expressed that similar conferences should be held at least once every two years.

The papers read at the general conference, or extracts therefrom, will appear in this and subsequent issues of the ERA.

A list of those attending the conference, other than Denver office employees, follows:

WASHINGTON OFFICE

Elwood Mead, Commissioner of Reclamation.
Porter W. Dent, assistant to commissioner.
George C. Kreutzer, director of reclamation economics.
William F. Kuhach, chief accountant.
Hugh A. Brown, chief, division of settlement and economic operations.
Frank J. Bergin, attorney.
W. A. Meyer, fiscal inspector.
C. A. Lyman, fiscal inspector.

FIELD OFFICES

Project Superintendents or Construction Engineers

F. C. Youngblutt, Belle Fourche project, Newell, S. Dak.
L. E. Foster, Carlshad project, Carlshad, N. Mex.
J. C. Page, Grand Valley project, Grand Junction, Colo.
H. M. Schilling, Huntley project, Ballantine, Mont.
H. D. Newell, Klamath project, Klamath Falls, Oreg.
H. A. Parker, Lower Yellowstone project, Savage, Mont.
H. H. Johnson, Milk River project, Malta, Mont.
E. B. Darlington, Minidoka project, Burley, Idaho.
A. W. Walker, Newlands project, Fallon, Nev.
H. O. Stetson, North Platte project, Mitchell, Nebr.
Calvin Casteel, Okanogan project, Okanogan, Wash.
R. C. E. Weber, Orland project, Orland, Calif.
L. M. Lawson, Rio Grande project, El Paso, Tex.
H. D. Comstock, Riverton project, Riverton, Wyo.
L. H. Mitchell, Shoshone project, Powell, Wyo.
G. O. Sanford, Sun River project, Fairfield, Mont.
L. J. Foster, Uncompahgre project, Montrose, Colo.
J. L. Lytel, Yakima project, Yakima, Wash.
P. J. Preston, Yuma project, Yuma, Ariz.
F. A. Banks, Owyhee project, Adrian, Oreg.
W. R. Young, Kittitas division, Yakima project, Ellensburg, Wash.
H. W. Bashore, Vale project, Vale, Oreg.

District Counsel

E. E. Roddis, Billings, Mont.
W. J. Burke, Mitchell, Nebr.
J. R. Alexander, Montrose, Colo.
R. J. Coffey, Berkeley, Calif.
H. J. S. Devries, El Paso, Tex.
B. E. Stoutemyer, Portland, Oreg.

STONY GORGE DAM, ORLAND PROJECT, MARCH 26, 1927

Left to right: C. A. Templeton, H. A. Brown, J. J. Flaherty, E. M. King, Garnett King, W. G. Elliott, W. J. Donald, Dr. Elwood Mead, George R. Freeman, W. A. Beard, Joseph Simon, R. C. E. Weber, J. N. Cook, H. J. Gault, W. G. Gurnett, George Strum, Dr. Hubert Work

Taxes Take One-third of Colorado Farm Rents

State and local property taxes took over 33 per cent of the net income from rented farms in Colorado during the year 1925. This represents a slight decrease in the proportion of rent taken by taxes as compared with 1923, but a marked increase in the tax burden as compared with 1919. The figures are based on a survey by the Colorado State Agricultural College and the United States Department of Agriculture.

Property taxes on 568 Colorado farms reporting such taxes for 1925 averaged 61 cents an acre. Gross rents on these farms averaged $2.30 an acre and net rent before the payment of taxes, $1.84.

Reports for 1923 were received from 414 farms. Their gross rents averaged $2.25 per acre, net rents before taxes were paid averaged $1.80 an acre, and taxes 68 cents per acre. Taxes in 1923 amounted to nearly 38 per cent of the net income.

The situation in 1919 was more favorable. Two hundred and eighty-two farms reported gross rents averaging $3.07 per acre; net rent, $2.64; and taxes, 60 cents an acre. Taxes that year took slightly less than 23 per cent of the net income from the farms.

HEAVY snows prevailed on the Gunnison and Uncompahgre watersheds, Uncompahgre project, during March, and the present indications are that an excellent water supply will be available for the 1927 season. The watersheds were in an unfrozen condition prior to the time the fall snows began, and as a result it is anticipated that much of the precipitation now in the hills will be held over in storage for the late summer supply.

Gibson Dam, Sun River Project, Montana

By Byrum W. Steele, Engineer

THE Gibson Dam, contract for the construction of which has been awarded to the Utah Construction Co., is now under construction. The dam site (see opposite page) is located about 80 miles west of Great Falls, Mont., on the North Fork of Sun River, a tributary to the Missouri River. The dam will be of the massive concrete arch type. It will have a crest length of approximately 900 feet and a maximum height of 195 feet. Augusta is the nearest railroad point and is the terminus of the Great Northern Railway branch line from Great Falls. The distance from Augusta to the dam site is approximately 23 miles, the greater part of the distance being over rolling country. About 3 miles below Gibson Dam site is the Sun River diversion dam, which is the point of diversion of all water for the 90,000 acres of the irrigable land of the Sun River project lying north of Sun River.

In order to obtain electric power for the operations connected with the construction of the dam, the contractor has built about 28 miles of transmission line from the Montana Light & Power Co.'s line to Augusta.

Excavation for the base of the dam and the spillway were started as soon as the electric power was available, early in December, 1926. The rock to be excavated is a fine-grained limestone, which near the surface is badly weathered. The construction program contemplates completing all excavation for the dam and spillway by August, 1927, after which time concrete will be poured as far into the winter as the weather will permit. During the winter of 1927–28 it is contemplated that work at the dam will be largely suspended, since it would not be economical to place concrete during the winter months in this climate.

The spillway is located in the north abutment and provides for a discharge of 50,000 second-feet by means of an uncontrolled circular lip discharging into a vertical shaft and in turn into a horizontal tunnel leading to the river level below the dam. Provision has been made in the design so that drum gates may be installed on the spillway lip at some later date, thus increasing the storage capacity of the reservoir from 90,000 to 105,000 acre-feet without raising the crest of the dam above the elevation provided for in the present contract. The spillway will be concrete lined throughout, the intake, outlet, and shaft lining being reinforced. The horizontal or tunnel portion of the spillway will be lined with plain concrete.

River diversion while the base of the dam is being constructed in the river section will probably be accomplished through an adit driven into the spillway tunnel above the dam. Temporary openings through the base of the dam at low-water level will be provided to accommodate floods during construction that are too large for the tunnel adit to handle without overtopping the structure. These openings will be closed by filling with concrete and the surfaces of contact thoroughly grouted after the dam is otherwise completed and the tunnel adit plugged.

The outlets for irrigation water will be placed through the central portion of the dam near the downstream water level and will be controlled by two 60-inch balanced needle valves. These valves will be supplemented by high-pressure emergency gates 5 feet square. The openings through the dam from the trash rack structure to the valves will be lined with semisteel conduit lining.

Concrete materials will be secured from deposits along Sun River below the dam site. The mass concrete for the main body of the dam will include cobbles ranging in size from 2½ to 8 inches in diameter. The computed maximum stress in the dam is a little over 600 pounds, and the strength of the mass concrete is expected to show at least 2,000 pounds per square inch at 28 days.

Construction joints radial to the upstream face of the dam will be placed at intervals of 30 feet above and 60 feet below elevation 4650. Each contraction joint will be provided with a drainage well 6 inches in diameter and a copper sealing strip to prevent leakage through the joint. These drainage wells will be connected at the base of the dam to the drainage system described in the next paragraph.

An elaborate system of drainage will be installed in the dam to relieve uplift pressure both in the foundation rock under the dam and in the dam itself. This system will consist of 4-inch metal pipes in the upstream cut-off connecting the drainage holes drilled in the foundation to 6-inch horizontal pipes leading to the downstream side of the dam. Connecting to these same 6-inch horizontal pipes 3-inch vertical concrete drains will be located 3 feet from the vertical upstream face of the dam. These drains, as well as the grout pipes, will be located at intervals of 5 feet, the grout pipe being upstream from the drainage pipe. The grout holes will be drilled after the upstream cut-off has been excavated and as soon as the grouting of the foundation has been completed the drainage holes will be drilled into the foundation rock through the 4-inch drainage pipes placed in the cut-off for that purpose. As soon as the drainage holes are drilled the upstream leg of the drainage pipe will be plugged.

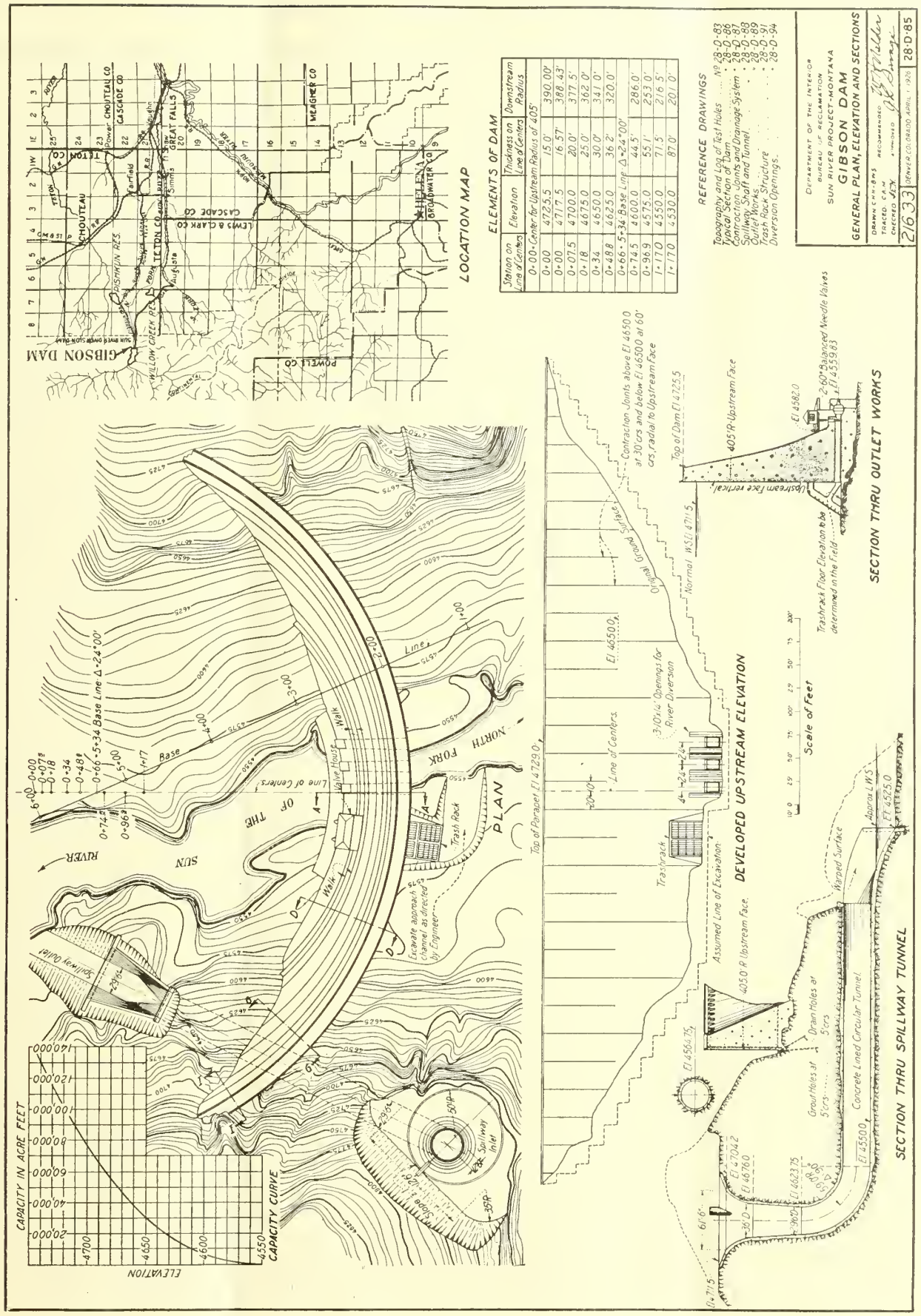
Record Cotton Production

The world's record cotton production on a small acreage is believed to have been accomplished in the Yuma Valley during the past year, it became known recently, when two Yuma Valley cotton farmers made affidavit that they had grown 6,505 pounds of lint cotton on 3½ acres of land located in the Yuma Valley. The land was located on West Fifteenth Street and the farmers are J. R. Bertrem and T. C. Welch. Six thousand five hundred and five pounds of lint cotton will make 13 bales of cotton averaging 500 pounds each, with 5 pounds to spare. It will also average almost four bales of cotton to the acre. In order to be certain about the yield, the two men had the patch of cotton carefully measured as to space, and by reason of their crop are now claiming the world's record. (Yuma Morning Sun.)

Pumping From Wells Aids Seeped Areas

In the Salt River Valley of Arizona, as well as at a number of other places in the West, excessive irrigation, resulting in deep percolation, together with seepage from canals, has unfitted large areas for cultivation by reason of the raising of the ground-water level. These areas have increased rapidly in extent until corrective measures have become imperative.

Test borings in the Salt River project showed that about half of the project is underlaid by a coarse, water-bearing formation from which water may be pumped; and, as the Salt River Water Users' Association had available a large quantity of cheap electric power generated at its own plant, it was decided to install electric-driven pumps in wells located in the damaged areas to lower the ground-water level. This plan has been successful; water-logged land has been reclaimed; the rise of ground water in sections not yet damaged has been checked, and the pumped water has been used very largely to augment the supply available for irrigation.



(See opposite page)

Irrigation District May Make Payment to Agent to Represent District Before Congress on District Business

THE case of Crawford *v.* Imperial Irrigation District, decided by the Supreme Court of California January 31, 1927 (253 Pac. 726), deals with the power of an irrigation district, organized under the laws of California, to employ an agent to appear before the various committees of Congress to present facts and arguments in favor of the Swing-Johnson or Boulder Canyon Dam bill. The district contracted to pay such agent at the rate of $250 per month, and a taxpayer of the district questioned in court the authority of the district to make such a contract.

The court, after finding that the contract was not contrary to public policy, as it would be if it provided for the use of sinister or personal influence upon the Members of Congress, proceeds to the discussion of the more important question, whether the making of such a contract was ultra vires the district.

The court points out that the statute under which the district was organized authorizes the board of directors of an irrigation district to "enter into, and do any acts necessary or proper for the performance of, any agreements with the United States, * * * for the joint acquisition, construction, leasing, ownership, disposition, use, management, maintenance, repair, or operation of any rights, works, or other property of a kind which might lawfully be acquired or owned by the irrigation district, and may acquire the right to store water in any reservoirs or to carry water through any canal, ditch, or conduit not owned or controlled by the district." Sections of the code authorizing the district to construct dams and reservoirs and to expend money for the protection of the district's canal system were also quoted.

The purpose of the Swing-Johnson bill before Congress was the construction of a dam across the Colorado River at Boulder Canyon, and the flood protection of the lands on the lower reaches of the river, including the territory of the Imperial irrigation district.

The court upheld the power of the district to employ an agent to present the facts in favor of the Boulder Canyon Dam before the committees of Congress. The court says:

In order to perform these duties and execute the powers thus given to the board of directors of the irrigation district, it is apparent that it may be necessary for the board to adopt some means of bringing to the attention of the United States Government or other Governments with which the district may wish to enter into contracts, the subject matter of the proposed contracts. It also seems apparent to us that occasions may arise when it will be absolutely necessary in the best interests of the district that it be represented in person before the proper boards or instrumentalities of these Governments in order that the claims of the district as to the matters before these boards may be understood by the officials charged with the consideration of such matters. * * *

The Swing-Johnson bill authorizes the construction of a dam in the Colorado River at a point in or near Boulder Canyon, and also the construction of a canal from the Laguna Dam in said river to the lands of the Imperial irrigation district. The dam and canal are to be built according to the terms of said bill by the United States Government, and the former is to be paid for by revenues to be derived from the leasing of power privileges incident thereto and the latter by the lands to be benefited thereby. This case was submitted in its entirety upon an agreed statement of facts. This statement recites at some length the problems of the Imperial irrigation district and its efforts to secure an adequate water supply for the use of its inhabitants for irrigation and domestic purposes, and protection of the district from the flood waters of the Colorado River. * * *

The district is not financially able to construct said dam and canal, and, if it were able, it has no authority from the United States or the States in which said dam would necessarily have to be located to build said dam. From these facts it appears that the only means whereby said district can hope to obtain a supply of water for irrigation and domestic purposes and to secure protection from destruction of the lands therein by the flood waters of the Colorado River is through a contract with the United States Government. It is the object and purpose of the Swing-Johnson bill to enable the Government to enter into such a contract with the district. The purpose of employing Mr. Fly and sending him to Washington is to enable the district through him to present the facts bearing upon the subject matter of the proposed legislation before the committees in Congress having this bill under consideration. We think it is plainly within the powers of the board of directors of said district to furnish to Congress all the information in its possession which might tend in any manner to enlighten the members of that body upon the pending bill, and, if in the judgment of the board of directors this can best be done by having a representative of the district appear personally before the committees of Congress, then in our opinion said board of directors is authorized to employ and send to Congress such a representative.

Sixteen Per Cent Profit on 7-Acre Orange Grove

It is estimated that the net profit on a valuation of $10,000 will be shown this year on 7 acres of young orange trees on the Orland project, according to information furnished by George A. Barceloux at a recent banquet given by the Orange Growers' Association. This profit will be realized on the 10-acre tract sold recently by the Bank of Orland to Frederick Evans, a Navy man, for $10,000. The tract lies north and east of the W. W. Allen and Lindstrom orchards, 4 miles from town.

Two years ago the bank took over this property from the owner, who considered it a losing proposition. The orchard was in bad shape, the trees being not over 6 feet in height and the weeds almost as high. The bank secured the services of W. W. Allen, a successful orchardist.

Barnyard manure and cover crops were the only fertilizer used on the place. Although it is a 10-acre tract, there are actually only 7 acres in oranges, the rest being planted to family orchard and lemons, the latter being budded over this year by the new owner to navels.

A year ago 300 lug boxes of Valencias and 865 boxes of navels were taken off and sold through the local association, netting the bank 7.9 per cent on the $10,000 investment. This year, 1,334 lug boxes of navels were delivered to the packing house, and a conservative estimate of 400 lug boxes of Valencias has been made. Prices for the two years were approximately the same.

This profit comes from young trees, far from full bearing, and from trees that until the past two years had indifferent care. Mr. Evans will have the orchard cared for by Mr. Allen until he retires from the Navy, when he plans to come to Orland and make his home on the fine producing acreage. (Orland Register.)

WE regret the omission of the Woman's Page this month, which has been occasioned by the numerous added duties placed upon the associate editor. Miss Schnurr is now in the West attending, in her capacity as secretary, an informal meeting of the Commission on the Equitable Use of the Waters of the Rio Grande. Later she will accompany Doctor Mead on a visit to several of the projects. We hope to resume her helpful articles in next month's issue.

Important Construction in progress during 1927 and proposed for 1928 by the Bureau of Reclamation

By R. F. Walter, Chief Engineer

THE BUREAU PROGRAM

Appropriations made available by the last Congress for the Bureau of Reclamation for the fiscal year 1928, including carry-over funds estimated at $2,175,500, total $14,049,300, as against a total of $15,082,862 for the present year.

This comparison is of little significance, however, as the expenditure of a large part of the appropriation for 1927 has been delayed pending execution and confirmation of repayment contracts. A considerable part of the 1927 appropriation is therefore carried over to 1928 and next year's expenditure will be much larger than during 1927 or other recent years. In each year's total all of the appropriation is from the reclamation fund, except $35,000 for the Yuma project levee maintenance and $15,000 for investigation of swamp and cut-over lands in seven Southern States, which are from the General Treasury. The 1928 program includes $2,130,300 for operation and maintenance of constructed projects and power plants; $277,000 for examination and surveys, including $75,000 for survey and reports on secondary projects; $50,000 for investigations on the Upper Truckee River in Nevada and $100,000 for economic investigations; and $11,642,000 for construction.

This construction appropriation is divided by principal features as follows: Storage, $5,933,000; canal system, $3,465,000; drainage and flood protection, $1,323,000; power development, $877,000; and miscellaneous construction, including telephone and permanent improvements, $43,500.

In addition to the above appropriation for 1928, the bureau program included $300,000 for a pumping plant to tide over seasonal water shortages on the Okanogan project; $500,000 for continuing the construction of the Pilot Butte Canal on the Riverton project, estimated to cost $1,000,000 when completed; $100,000 for completion of reconstruction of the Truckee Canal on the Newlands project, and a reappropriation of $106,000 for the Deadwood Reservoir on the new Payette project, in the second deficiency bill, which failed to pass before Congress adjourned.

THREE DAMS WILL BE COMPLETED THIS YEAR

The present year will witness the completion of the American Falls Reservoir on the Snake River in Idaho, exclusive of the proposed power development; the Guernsey Reservoir and power plant on the North Platte River in Wyoming; and the McKay Reservoir on a branch of the Umatilla River in Oregon.

High-grade Holstein heifers, Fort Shaw division, Sun River project

THE AMERICAN FALLS RESERVOIR

The American Falls Reservoir has a capacity of 1,700,000 acre-feet and was estimated to cost $8,500,000, or $5 per acre-foot. About half of the capacity has been acquired by private projects in the Snake River Valley requiring supplemental water supply, and the other half will be available for the proposed north unit of the Minidoka project and the Gooding project. Funds were advanced for the construction cost on account of storage capacity contracted by the private projects before construction was authorized.

The Government retained the potential power privilege which will result in an installation of a 40,000-horsepower development largely required in connection with the proposed irrigation of 100,000 acres in the Minidoka north side pumping unit, which lands lie above the present north side gravity unit of that project.

The estimated cost of the installation of this power development, in four units, is about $3,000,000. The cost of the installation of one unit of 10,000 horsepower, together with the tailrace excavation and other joint construction required for all four units, is about half this amount. As but $700,000 is available in the 1928 appropriation, no power can be made available without an additional appropriation. Under the circumstances, unless the power developed can be contracted in advance, at a fair return during the 10-year period prior to its requirement for the Minidoka north side pumping division, it will not be good business to make this investment until just before the power is needed.

The construction of this reservoir required the purchase and removal of a large part of the town of American Falls, the purchase of some 56,000 acres of agricultural and grazing lands which are flooded thereby, the removal of 2 miles of the Oregon Short Line Railroad and subordination of a large power plant.

The dam consists of a concrete overflow section 95 feet high and 650 feet long, a concrete gravity section 2,400 feet long, and low earth embankments 1,800 feet long. The dam was constructed under contract by the Utah Construction Co. At this time it appears, regardless of the fact that the low bid on the dam was $250,000 in excess of the engineers' estimate therefor, that the cost of the reservoir, when completed in July, will show a cost for storage capacity nearly 10 per

cent less than the engineers' estimates. Some water was stored during 1926 and at present it appears that full storage will be obtained this year.

THE GUERNSEY RESERVOIR

The Guernsey Dam, an earth and rock fill structure, which will be completed during August, is 100 feet in height, with a top length of 600 feet. The capacity of the reservoir is 70,000 acre-feet, but on account of its strategic location, just above the heads of the main canals irrigating the valley, it will fill two or more times each year. Two 2,400 kv.-a. power units are being installed. The dam and power house are being constructed under contract with the Utah Construction Co. The estimated cost of the reservoir and the two-unit power development is $2,350,000. The completed cost will vary but little from the engineers' estimate. Water is now being stored for this year's use.

THE McKAY RESERVOIR

McKay Reservoir, about 8 miles from Pendleton, Oreg., has a capacity of 75,000 acre-feet, and is formed by the McKay Dam, having a height of 160 feet and a length of 2,600 feet. The dam is constructed of gravelly material with a heavy reinforced concrete face connecting with bedrock. This dam was constructed by Government forces. The engineers' estimate of cost of the reservoir was $2,500,000. The work, except for the installation of the control valves, on which

(Continued on page 73)

What A Modern Creamery Means To an Irrigated Farming Community

UNTIL the fall of 1924 the dairy business on the Shoshone project was a very uncertain one. Not that there were no cows, but the market was not satisfactory. There was a creamery at Powell and other agencies purchased cream, but for some reason neither the dairy farmer nor the creamery were making expenses.

In October, 1923, William Castberg, a young man with considerable experience in both the manufacturing and selling of dairy products, purchased the Farmers Cooperative Creamery, then closed to business, for $1,000. He knew before starting that he would have the same competition that had played an important part in making the cooperative creamery a failure; that human nature was the same on the Powell Flat as in any new dairy, territory in that many farmers would sell their cream to the party paying the most for their dairy products, regardless of the best interests of the community.

During the three and one-half years that Mr. Castberg has been managing the creamery at Powell he has made many changes both in the interior and exterior of the building, which is 40 by 70 feet. The grounds which comprise a little over an acre have been so changed during the past three years that it would be difficult to recognize the property if it were not for the surrounding landmarks. Handy driveways, flanked by bluegrass lawns, now lead from the main highway to the creamery. On each side of the driveway is a white-painted rail fence and last year 135 Iowa ash trees were set out to increase the attractiveness of the premises.

Since the Powell Creamery has been under the present management three different sets of machinery have been installed, the last being an up-to-date electrically operated churn and Pasteurizer. The capacity of this modern equipment is about 1,000,000 pounds of butter per year. In addition to this major equipment the creamery has its own ice plant with a capacity of 4 tons every 36 hours, and the latest machinery used in making ice cream. Seven motors are used in operating the various machines. With natural gas, city water, electricity, telephone, and the Chicago, Burlington & Quincy Railroad for transportation, all that remains to make a creamery a success is the addition of cows.

When Mr. Castberg became manager of the Powell Creamery the dairy cow was not considered very valuable property. At sales three years ago dairy cows sold for from $35 to $70. To-day it is not unusual for a good dairy cow to sell for over $100. Recently a registered Holstein cow sold for $175. Through the assistance of the county agent young dairy stock is being shipped to the project.

The first year under the present management the Powell Creamery made 46,000 pounds of butter, the second year 72,000 pounds, and last year 162,000 pounds, and it is estimated 225,000 pounds will be manufactured this year in addition to about 7,000 gallons of ice cream.

A market has been the least of Mr. Castberg's troubles. During the tourist season, butter and ice cream are sold in large quantities to the Cody Inn, a hotel owned and operated by the Chicago, Burlington & Quincy Railroad. The chief reason that the Powell Creamery products are in demand is the fine quality of butter and ice cream put on the market. The neat and sanitary condition of the entire plant and premises is the best "ad" possible.

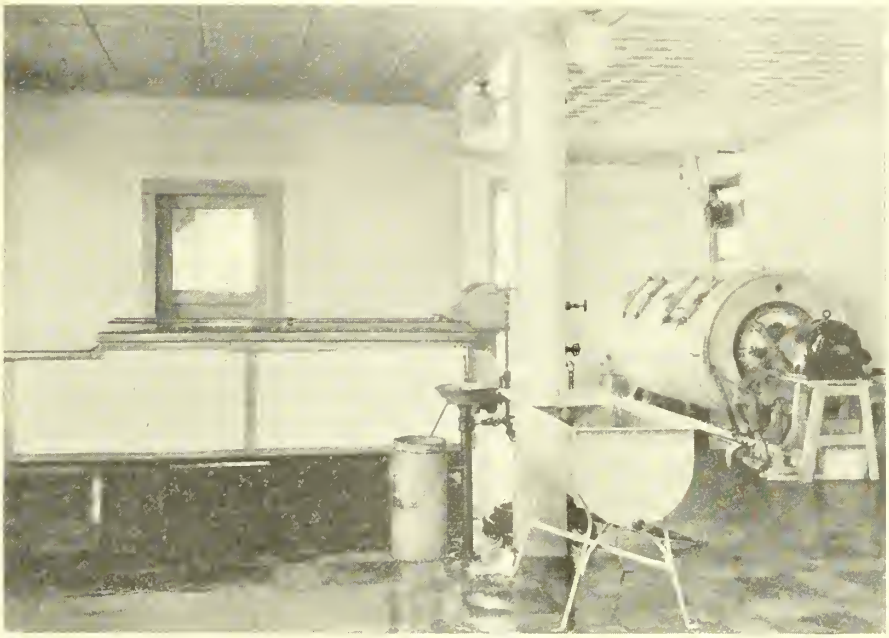
Along with the growth of the dairy business the poultry, turkey, and hog industry has increased and prospered. This is due to using the skim milk and buttermilk to the best advantage.

The following example of what thrift means to a settler on the Powell Flat should be of interest:

Creamery on the Shoshone project, Wyoming

About the time of the close of the World War a settler purchased two registered heifer calves and a registered Holstein bull. In 1926 the increase from this small start netted this man $1,212 for his cream alone, besides the dairy products for his family, the increase in the number of his herd, the by-products for his poultry and hogs, and the manure for the upkeep of the fertility of his farm.

In February, 1927, the Powell Creamery purchased 9,600 pounds of butterfat, manufactured 11,700 pounds of butter, and 165 gallons of ice cream. The dairy business has just started. When the 12,000 acres of new land on the Willwood are farmed and the vacant tracts in the Powell and Deaver districts settled, it is safe to say there will be a cheese factory added to the present Castberg Creamery.



Electrically operated churn and pasteurizer, Castberg Creamery, Powell, Wyo.

Construction in Progress, 1927

(Continued from page 72)

the delivery was delayed by the manufacturers but which are now being installed, was completed several months ago. The actual cost when completed will not exceed $2,150,000, or $350,000 less than the engineers' estimate. Water is now being stored and will be available for use during the present year.

THREE POWER PLANTS TO BE COMPLETED THIS YEAR

On the Yuma project a power plant of two units, capable of developing 2,200 horsepower at maximum head, was completed during last August at a cost of $285,000 and has since been in operation. The sale of the surplus power, after supplying the project demand for pumping of irrigation water to the Yuma Mesa and drainage water from the valley drain, will net the project at least $35,000 per year until more power is needed for project uses.

A sixth power unit is now under construction at the Minidoka Dam on the Minidoka project, which will be completed before July 1, at a cost of $200,000. This installation will increase the project power output by 3,500 horsepower, most of which is required for project uses during the summer.

The first unit of the Guernsey power plant on the North Platte project will be completed about July 1, 1927, and the second unit a short time later. Each unit will develop 3,400 horsepower, under a head of 65 feet. All of the power from the first unit is sold and the gross revenue will be $150,000 per year.

FIVE PROJECT DIVISIONS TO BE COMPLETED THIS YEAR

Other important construction which has been or will be completed during the present year includes the Orchard Mesa unit of the Grand Valley project, which irrigates 10,000 acres, at a cost of $1,000,000; the Langell Valley unit of the Klamath project, except 6 miles of drain, irrigating 12,000 acres at a cost, including the drainage, of about $930,000; the first or Pavillion unit of the Riverton project, irrigating 20,000 acres; the Tule Lake unit, irrigating 10,000 acres in the Klamath project; and the Willwood unit of the Shoshone project, having an irrigable area of 15,600 acres. With the exception of about one-half of the area in the Orchard Mesa and one-third in Langell Valley and Tule Lake projects, these tracts are as yet uncultivated and require settlement by experienced farmers with sufficient capital for development work.

THE GIBSON DAM NOW UNDER CONSTRUCTION

Contracts for two important dams were awarded during the year. The Gibson Dam on the Sun River project is located in the Sun River Canyon about 3 miles above the diversion for the Greenfields main canal, and the reservoir created thereby will have a capacity of 105,000 acre-feet and furnish a supplemental supply for 90,000 acres of the Sun River project, of which the distribution system has been completed for about 40,000 acres. This dam will be of the concrete arch type 200 feet in height and 900 feet crest length.

The contract for the dam was awarded to the low bidders, the Utah Construction Co., on September 13, 1926, for $1,566,240 as against the engineers' estimate of $1,827,435. There were seven bids submitted. The estimated cost of the reservoir complete is $3,000,000. Work is now in progress on foundation excavation. The dam will be completed during 1929.

THE STONY GORGE DAM UNDER CONSTRUCTION

The Stony Gorge Reservoir on the Orland project in California will have a capacity of 50,200 acre-feet, and is being constructed as a supplemental supply for 20,000 acres, now under irrigation in the project, at an estimated cost of $1,230,000. The dam consists of an Ambursen type structure 120 feet in height and approximately 1,000 feet long. Contract for the construction of this dam was awarded to the Ambursen Construction Co. on October 2, 1926, for $518,904, as against the engineers' estimate of $609,524. There were 14 proposals received. Excavation for the foundation is now in progress, and the dam will be completed during 1928.

SIX NEW PROJECTS ARE AUTHORIZED

During the past year repayment contracts were completed and construction began on three new projects or divisions, namely, the Kittitas in Washington, and the Owyhee and Vale projects in Oregon. During this year it is anticipated repayment contracts will be completed and

actual construction inaugurated on three additional new projects, namely, the Echo Reservoir for the Salt Lake Basin project in Utah, and the Gooding and Payette projects in Idaho. These six new projects will cost $50,000,000, and irrigate or furnish supplemental water, as is the function of the Echo Reservoir, to 435,000 acres. Of the $50,000,000 estimated cost, $4,000,000 is represented by the cost of storage and works already available, and $10,000,000 is included in the appropriations for 1927 and 1928 now available, leaving a total of $36,000,000 to be provided for these six new projects by appropriations during the 1929 and subsequent fiscal years.

THE OWYHEE DAM, THE HIGHEST YET CONSTRUCTED

From an engineering and construction standpoint this program is exceedingly interesting. It includes what will be at this time the highest dam in the world, the Owyhee, which will be in excess of 360 feet in height, depending on the depth of excavation required for the foundation, which is now being drilled in the canyon about 20 miles above the junction of the Owyhee with the Snake River. Alternate designs for this dam are now under preparation for study, but it is probable that the site is best adapted to an arch type concrete structure. The cost will exceed $6,000,000, or about one-third of the total cost of the Owyhee project. Advertisement will probably issue this fall. It will require three years to construct.

OTHER IMPORTANT DAMS NOW BEING DESIGNED

The storage of water required for these six new projects will involve, in addition to that on the Owyhee above described, a 2-mile outlet tunnel, 70 feet below the present water surface of Lake Cle Elum in Washington, and a long low embankment raising the present water surface 10 feet to make available a storage capacity of 500,000 acre-feet needed in part for the Kittitas project and other lands in the Yakima Valley at a probable cost of $5,000,000; a concrete dam 100 feet high on Deadwood River, a branch of the Payette for the Payette project at an estimated cost of $1,100,000; and an earthen dam, 125 feet high and 1,800 feet long, on the Weber River, at a cost of some $2,000,000 for the Great Salt Lake Basin project. This last design is completed.

STORAGE REQUIREMENTS FOR NEW PROJECTS

The combined storage capacity of these four reservoirs is 1,269,000 acre-feet, the estimated cost of which is $15,000,000, or about $12 per acre-foot.

Storage in addition thereto is already available in the Warmsprings Reservoir, having a capacity of 170,000 acre-feet, of which one-half interest has been purchased for the Vale project, at $8 per acre-foot and in the American Falls Reservoir, in which 400,000 acre-feet of capacity, representing a cost of $5 per acre-foot, has been reserved for the Gooding project.

CANAL SYSTEMS FOR NEW PROJECTS

Some 16 miles of concrete-lined tunnels, 4½ miles of steel siphons under hydrostatic heads up to 350 feet, and several miles of concrete bench flumes and siphons will be involved in the construction of the 350 miles of main canal required for these six new projects, the cost of which will exceed $25,000,000. Parts of the main canal construction for the Owyhee, Vale, and Kittitas projects are the most difficult and expensive yet undertaken by the bureau, with the possible exception of that of the main canal of the Tieton project. The funds appropriated and available during 1927 and 1928 for these canal systems are $5,780,000, largely for the Kittitas and Vale canal construction. The construction of the first section of the Kittitas canal has been in progress since last July under contract with the United Construction Co.

DRAINAGE CONSTRUCTION

During the past few years, due to catching up with the seepage condition on many of the old projects, comparatively little drainage construction has been in progress. With the execution of new repayment contracts on several projects on which the seepage condition is becoming serious, there will be renewed activities on this feature. The program for 1928 provides funds for some 250 miles of drain, and includes beginning construction on a $1,000,000 system for the Belle Fourche project, a $525,000 system on the Lower Yellowstone project, a $450,000 system for the Warmsprings district on the Vale project, completion of a $950,000 system on the Newlands, a $60,000 drain for the Langell Valley division of the Klamath project, and a $335,000 system on the Huntley project, as well as continuation of excavation of drain extensions as required by seepage conditions on the Yuma, Boise, Minidoka, Grand Valley, Sun River, and Rio Grande projects, and for the Garland division of the Shoshone, and the Fort Laramie division of the North Platte projects.

Except for continuation of the work already authorized on old projects and for the drainage work for the Warmsprings district, which, on account of special conditions, has been authorized by Government forces, all drainage, as well as other large construction, will be advertised and contracted, if reasonable bids are received. Heretofore, on account of difficulties in adequately covering changing conditions

An Orland project farm residence

in contracts, drainage work has been done by Government forces and the Lower Yellowstone drainage will be the first to be advertised.

PLANS AND SPECIFICATIONS UNDER PREPARATION FOR ISSUE OF ADVERTISEMENTS

In connection with the Owyhee Dam and later for use in the tunnel construction for this project, it is proposed to construct 25 miles of construction railroad from Adrian, Oreg., to the dam site. This railroad will be necessary to transport the sand and gravel which must be secured along the Snake River and cement and other construction materials and supplies from the Union Pacific Railroad. It is also proposed to make connection with the power lines of the Black Canyon power plant on the Payette River in order that Government-owned power may be available for this large construction program during the five or more years that will be required for this work. This will require the construction of some 50 miles of high-voltage transmission line. Surveys have been completed, preparation of plans and specifications are in progress, and advertisement for the railroad and part of the power line construction should issue in the near future.

The design of the Owyhee Dam, which will be the highest yet constructed, is largely dependent on the results of the diamond-drill borings which are now in progress with three drill rigs at this site. It is hoped to secure complete information thereon to enable determination of its type and final location in the canyon by July 1, and that designs and specifications may be completed and advertisement issued during the coming autumn. About $1,000,000 is now available for the dam, besides the funds required for railroad, power line, and camp construction and purchase of flooded lands in the reservoir site.

The Echo Reservoir will require the reconstruction of some 5 miles of the Park City branch of the Union Pacific Railroad and an equal length of the Lincoln Highway, which will be flooded thereby, at an estimated cost of $600,000. This will be the first construction undertaken under the proposed contract which it is expected may be advertised at a very early date. Plans and specifications for the dam and road work are practically ready for printing.

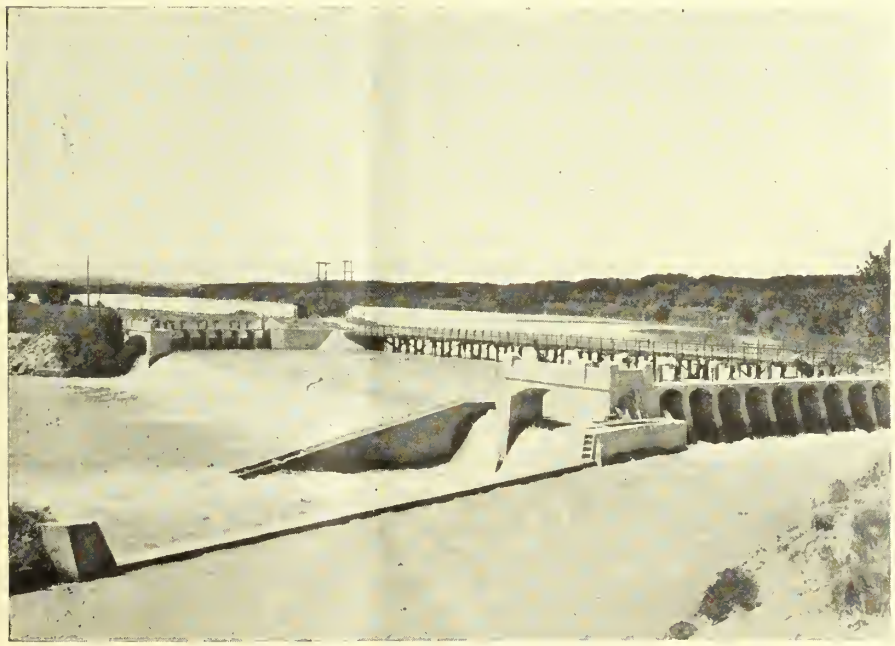
The award of contract for the second section of the main canal of the Kittitas project, for which 15 bids were received at the time of opening on December 28, is now pending. The low combination bid on this canal construction was $728,539, as against an engineers' estimate of $921,031. Plans and specifications for advertisement of a third section of this canal, involving a cost close to $1,000,000, are under preparation and advertisement will issue this spring, to be followed by advertisement for a fourth large section during the summer.

On April 12 bids will be opened for the construction of a 5-mile section of the main canal of the Vale project, involving an estimated expenditure, including cost of cement and material, of some $250,000. This will be followed by advertisement for a second section of the canal, involving some $700,000 expenditure, during the present summer.

Surveys will be inaugurated for final location of the main canal for the Gooding project, for which $400,000 has been appropriated about April 15, in order that the advertisement for the first section may issue as soon as repayment contracts are executed and confirmed by the court.

Considerable preliminary work will be required before plans and specifications for the Deadwood Dam for the Payette project, for which $400,000 has been appropriated, can be made ready for advertisement. Preparatory work thereon will probably require all the present summer, as the site is isolated and at a high altitude where the working seasons are short.

Plans and specifications are under preparation for advertisement of drainage construction on the Lower Yellowstone project, for which $165,000 is available. This advertisement should issue at an early date.



Whalen diversion dam and Interstate Canal head gates, North Platte project

Mr. Bissell Inspects Southern Properties

C. A. BISSELL, chief of the engineering division, Bureau of Reclamation, Washington, D. C., left Washington on April 4 for a preliminary investigation and inspection of a number of tracts of land in the South, with a view to reclamation and planned group settlement. Before returning to Washington, about the 1st of June, Mr. Bissell plans to visit tracts of land at Mayland, Tenn., Hattiesburg, Miss., Selma, Ala., Fort Lauderdale, Fla., and Pembroke, N. C.

The following will be associated with him in making the inspection and investigations: George R. Boyd, drainage engineer, Bureau of Public Roads; S. L. Jeffords, agronomist, Clemson College, S. C.; and a soil technologist.

Colonel Fly is again on his "Beloved Yuma Mesa" after another winter in the National Capital. Although painfully and critically ill the greater part of the season, he labored untiringly for the Yuma project and sought the passage of legislation which would materially benefit the entire Nation. He returned to the West happy in the realization of success attained so far as Yuma is concerned and optimistic for the early passage of the more important legislation.

Preparation of Appropriation Estimates for the Budget[1]

By William F. Kubach, Chief Accountant, Bureau of Reclamation

APPROPRIATION ESTIMATES FOR THE BUDGET

I ASSUME that this topic was assigned in order that the project officials may become more familiar with the Budget procedure now required.

The Budget and Accounting Act of 1921—the act providing for the establishment of the national Budget system—worked a revolution in the manner in which the estimates of appropriations needed for the conduct of the Government are formulated and submitted to Congress. Under the old system estimates were prepared by the heads of the several spending agencies who, in framing them, gave no consideration to the financial situation and prospects of the Government as a whole. Although these estimates were reviewed by the department heads, they still represented the desires of the spending agencies, which sought to secure the maximum appropriation possible. From the departments and independent establishments the estimates were sent to Congress through the Secretary of the Treasury. That officer acted merely as a compiling agency, without authority to revise the estimates or to express an opinion regarding their desirability. No comparison was made of the estimates with probable revenues with a view to determining the extent to which the requests for funds exceeded resources available for meeting them.

Under the new system the spending departments are prohibited from making any direct requests upon Congress for funds. Instead, their requests must be submitted to the President, upon whom is placed the full responsibility for the formulation and submission to Congress of a consolidated statement of what authorization, in his opinion, should be made for expenditures for the ensuing fiscal year. An estimate of prospective revenue accompanies the estimates of proposed expenditures and the two are brought into correlation in such a way as to show clearly whether the proposed expenditure program is less than or exceeds the prospective revenue.

In order that the President may discharge the great responsibility placed upon him, provision was made in the Budget and Accounting Act for an organization known as the Bureau of the Budget to act as direct agent of the President. In performing his duties as chief budget officer, the President is not confined to the mere formulation of the annual Budget but, through the Bureau of the Budget, exercises close control over the expenditures of moneys after they are appropriated by Congress, and through that bureau active steps are taken to secure improvement in the business methods of the Government with a view to keeping down the estimates to the smallest sums consistent with the service to be rendered and of controlling the expending of the moneys placed at the disposition of the departments and independent establishments.

PREPARATION OF THE BUDGET

The preparation of the Budget involves six principal steps. These are:

1. Announcement of the financial policy.
2. Submission of preliminary estimates.
3. Submission of final estimates.
4. Hearings before the board of estimates of the Bureau of the Budget.
5. Return of estimates to department for revision.
6. The preparation of the Budget document.

By the formulation and announcement of the financial policy is meant the determination of the position to be taken by the administration in respect to such matters as expansion or contraction of the Government's activities. The financial policy is announced by the President at the semiannual business meeting, to which are summoned all the directing personnel of the Government to meet with the President and the members of the Cabinet.

The second step is the preparation of preliminary estimates. These estimates are submitted to the Director of the Budget about July 15 of each year, their purpose being to supply advance information of what a department or establishment contemplates asking for the ensuing year. This explains the call for the preliminary estimates by the chief engineer about June 1 of each year. Heretofore these estimates have been submitted to the Budget in totals for each project. However, a detailed statement explaining the amounts comprising the project totals was submitted to the Budget Bureau with the estimates for 1928 and hearings were held. After study of the estimates has been completed each department is notified of the total amount to which its original estimate has been reduced and is directed to apportion this total in such manner as will best provide for its activities and to prepare its final estimates by appropriation titles and objects of expenditure as limited by this total.

The third step is the preparation of final estimates of appropriation, estimates of receipts, and estimates of expenditures. These must be submitted to the Budget Bureau on or before September 15 of each year. This step explains our second call upon the projects for the submission of detailed estimates. These estimates are consolidated in the Washington office and, together with statements of past, current, and estimated revenues, and explanation and justification for each item proposed, are submitted through the Budget officer of the Interior Department to the Bureau of the Budget. These estimates are prepared uniformly throughout the Government service. The details are set forth in accordance with the classification of objects of expenditures prescribed by the General Accounting Office in its Bulletin No. 1, dated May 11, 1922, copy of which has been furnished each project. From the submissions from the projects it is very evident that many of the project officials are not familiar with or do not understand the classification, and a circular has been recently dispatched with request that employees charged with the responsibility of preparing the Budget submission familiarize themselves with the requirements of this bulletin to the end that the classification of expenditures might be uniform.

The fourth step is the hearing before the board of estimates of the Bureau of the Budget, at which time the commissioner is again required to appear before the board and justify each and every item proposed. These hearings are very exhaustive, sometimes extending over several days.

The fifth step is that of returning the estimates for final revision to the department. These revisions involve the correction of not only the estimates of appropriations but also a modification of the expenditure program. No time is given for submitting the revision to the field, and the construction program must be revised as the necessity of the work requires. It is for this reason that reliable information must be at hand in the Washington office in order that intelligent revision can be made, as no time is allowed for referring this question to the field.

The sixth and final step is the preparation of the final Budget. We are engaged upon the Budget from June 1 to Septem-

[1] Address delivered at the Reclamation Conference in Denver, March 16-18.

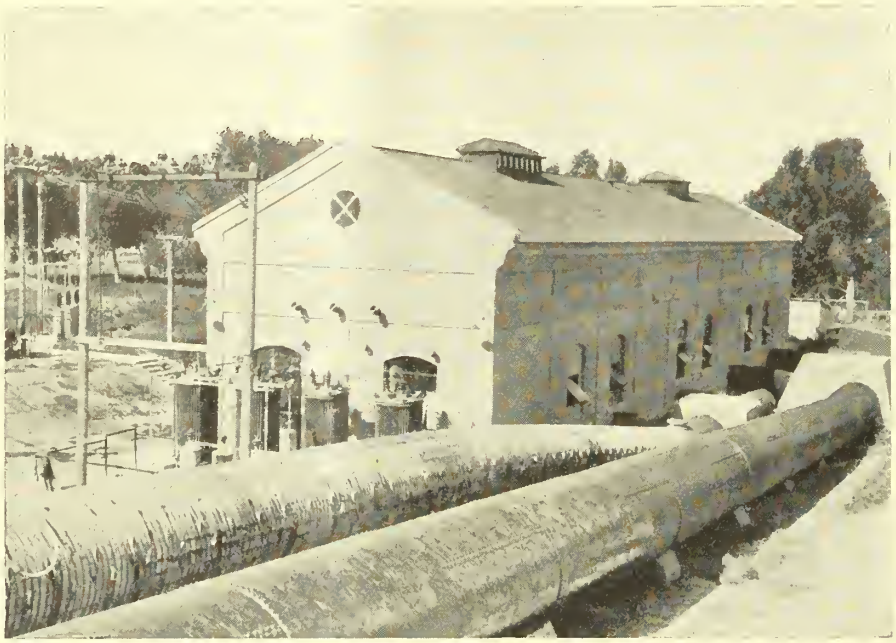
ber 15 and it requires the continuous effort of several employees. Immediately after the final Budget is submitted we must commence the preparation for the hearings before the Appropriations Committee. To this committee we must make a very complete statement explaining and justifying each and every item proposed for appropriation. The hearings before this committee continue for several days and much information must be assembled in anticipation of just what problems the hearings will develop, and the major part of the information furnished by the projects is for this purpose. I might add that these hearings are also exhaustive.

In the forepart of this paper statement is made that the Bureau of the Budget also controls the expending of the moneys placed at the disposition of the spending agencies. On or before the beginning of each fiscal year each spending agency must make an apportionment of its appropriations to the four quarters of the fiscal year, by appropriation titles, to the Budget officer of the department. Prior to the fiscal year 1927 one apportionment was made for the entire reclamation fund. This was comparatively easy and it was not necessary to call upon the field offices. However, for the fiscal year 1927 and thereafter the Bureau of the Budget insists on apportionments for each project

The field offices will be called upon shortly to make a quarterly apportionment of their 1928 appropriation. In making such apportionment each project will be required to set aside a part of each appropriation as a "reserve." Before obligating the appropriation in excess of the quarterly apportionment a waiver will be required, and before obligating any part of the reserve this must be released by the Budget officer of the department, whose actions are controlled by the Director of the Budget. The importance of this apportionment is directed to your attention in order that you may relieve the Washington office of as much embarrassment as possible occasioned by the incurrence of obligations in excess of the quarterly apportionment.

Obligations against appropriations for the field service must be authorized by the head of the bureau or agency in Washington controlling it. In some of the bureaus an authority is issued by its Washington office for each obligation incurred. You can readily understand how such a procedure would interfere with efficient and economical prosecution of construction and operation and maintenance. It was finally decided that our allotments, when approved by the commissioner, are in fact authority to incur obligations to the extent of the amount allotted, but as the law requires quarterly apportionments it was necessary to call upon the field offices for a quarterly apportionment of the allotments. Later, when determined, we must make another report of the amount of "actual obligations." The amount of "authorized obligations" for a given quarter must not exceed the amount apportioned to that quarter without first securing a "waiver" from the head of the department, and, of course, actual obligations must not exceed the amount authorized. We must depend upon the project offices to watch this, and when it is evident that actual obligations will exceed the amount apportioned to a particular quarter a waiver must be submitted before obligations in excess of the amount authorized are incurred.

Orchards in the Okanogan Valley



Lingle power plant, North Platte project

The "Home Place" Plan on a Canadian Project

AN article by C. J. Broderick, in a recent issue of Modern Irrigation, tells of the troubles encountered by the Lethbridge northern irrigation district in Alberta, Canada, and the steps taken to put the district on its feet. As in the United States, the problem was not one of construction nor of operation, but of repayment of the cost.

"The system had cost $5,500,000 to construct, and the area of the project was 100,000 irrigable acres. Each acre was assessed $5.25, $1.25 of which covered operation and maintenance. The assessment during the first seven years paid the interest and operation costs. After that an additional dollar was to be assessed to retire the bonds in 30 years."

The trouble was that the farmers could not pay $5.25 an acre. Another difficulty was that the land was held in too large acreages, running from 320 to 1,280. In order to meet the situation the "Lethbridge northern colonization act" was adopted.

"The essence of the legislation lies in the 'home place' plan. Much idle land in the district was held by absentees. More land was held by resident farmers in excess of what could be profitably farmed under irrigation."

The "home place" comprised a unit commensurate with the farmer's ability to make produce. A quarter section was suggested. The "home place" would pay charges on a schedule spread over 50 years. There would be no reduction in the assessed rate, but the Government would assist the settler, during the early years of development, in meeting his assessment, as follows:

"During the first year in which a home place was registered, the farmer is to pay no rates; the Government will advance the full assessment of $5.25 on his behalf. In the second and third years the farmer will pay the water service charge of $1.25 per acre, while the Government advances $4. In the fourth year, the farmer is assumed to have obtained a start and his proportion will be $3.25 while the Government pays $2. Each fourth year thereafter the farmer's proportion advances $1 until eventually he will be meeting the full assessment. At any time the farmer may pay the full capital cost of $55 per acre and receive title to his water right.

"This schedule took care of the actual resident producer within the limits of the area granted for a home place, but any surplus land he might have owned had to bear the full assessed rate. The Government had said, 'We will give relief, but not blanket relief.' The man with more land than he could make produce will not be allowed to speculate with it, or keep it idle at governmental expense. If he can not pay on his surplus land, then that surplus goes into the rate enforcement return at the end of two years and becomes the property of the irrigation district for resale to producing settlers."

Middle Rio Grande Conservancy District

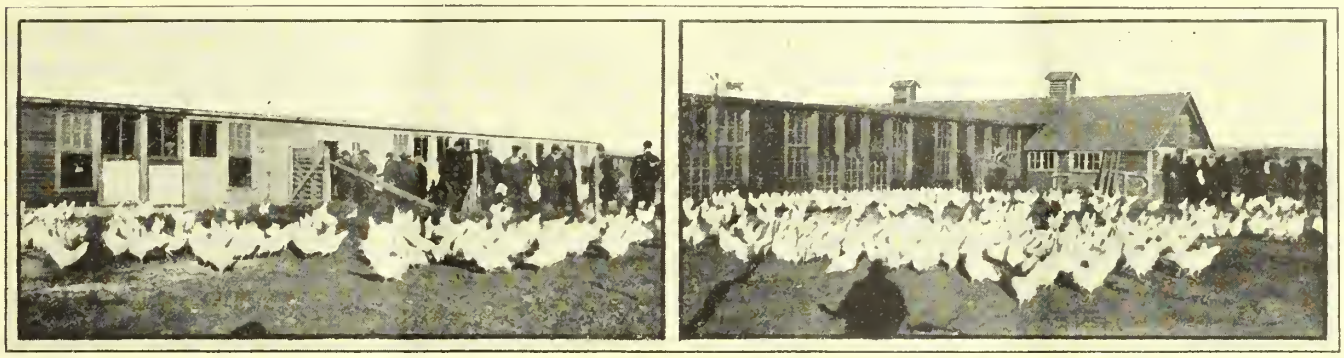
Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $50,000, or so much thereof as may be necessary, to provide for reconnaissance work on the lands of the Cochiti, Santo Domingo, San Felipe, Santa Ana, Sandia, and Isleta Indians, or so much thereof as may be susceptible of irrigation, lying within the exterior boundaries of the Middle Rio Grande Conservancy District, a political subdivision of the State of New Mexico, but not subject to district assessments, and to enable the Secretary of the Interior to provide for surveys, examinations, and the preparation of plans and specifications, for the reclamation, drainage, and irrigation of said lands and conservation of waters appurtenant thereto, in cooperation with said Middle Rio Grande Conservancy District, said money to be paid from time to time as said work proceeds, such payments, including the salary and expenses of the engineer hereinafter referred to, to be made in proportion to the expenditures heretofore or hereafter made by the district in the ratio that the area of the Indian lands bears to the other lands to be benefited, such expenditures to be subject to the approval of the Secretary of the Interior and to be made under such rules and regulations as may be prescribed by the Secretary of the Interior: *Provided,* That said Secretary, through the Commissioner of Indian Affairs, shall designate an engineer, who shall represent the department in the preparation of said plans and report thereon, and whose salary and expenses shall be paid out of the funds herein authorized to be appropriated: *Provided further,* That said sum or any part thereof that may be expended for this reconnaissance work shall be reimbursable by said Indian lands if and when the participation by the United States in construction of said project is approved by the United States, such reimbursement to be in accordance with the terms of the act of Congress approving such participation: *Provided further,* That the Secretary of the Interior shall report to Congress the results of said reconnaissance work and his recommendations thereon.

Approved, February 14, 1927. (Public, No. 620.)

Poultry Tour in the North Platte Valley

Five hundred farmers visit flocks in Scotts Bluff and Sioux Counties where increased interest in poultry raising is due largely to the work of the South Sioux Poultry Association

By D. H. Propps, Agriculturist, Mitchell, Nebr.



Left: Two-year-old hens at Chris Christensen's, who uses these for eggs to hatch in his 7,200-egg incubator. Right: Part of the 1,000 pullets at Jay Eckman's farm whose returns were $100 to $130 a week all fall

A NEW record in farm tours was established in the North Platte Valley recently when farmers and poultry growers from Bridgeport to Fort Laramie united in a big poultry tour of Scotts Bluff and Sioux Counties. As many as 60 cars were counted in the line in the afternoon, and it was estimated that at one time or another during the day a total of 500 people participated in the tour and received the benefits of the demonstrations.

Stops were made at nine different farms, where a special study was made of housing and winter egg production. Demonstrations were given showing how old houses had been remodeled and with little expense made into comfortable quarters. Houses that had been cold or damp had been made serviceable and satisfactory by the addition of straw lofts or straw ceilings. New houses of the latest type were inspected and the special advantages pointed out. Owners of flocks visited explained their methods of feeding and care, stressed the advantages of flock records, and told what their flocks were doing for them.

One of the most elaborate houses visited was at the Armstrong poultry farm near Scottsbluff. This house was fitted with electric lights, and running water was provided for the hens at all times. Mr. Armstrong explained the use of lights and gave a short discussion of feeding and management.

LARGEST FLOCKS IN SHEEP CREEK COMMUNITY

The climax in interest was reached in the afternoon when the flocks in Sheep Creek community, north of Henry, were visited. Most of the flocks in that community consist of 500 to 1,000 hens. Within a radius of a mile were more than 4,000 hens, from which the owners were marketing $400 to $500 worth of eggs a week. In the basement of the farm home of Mr. Christenson was a mammoth 7,200-egg incubator. Mr. Christenson supplies baby chicks to the community and to other farmers in the valley.

John Heinz has one of the largest flocks in the Sheep Creek community. In the demonstration at his farm Mr. Heinz spoke of the importance of proper housing and pointed out the necessity of getting pullets into winter quarters early. The 600 pullets on this farm were accustomed to be confined to the house and of course could not be turned out for the occasion. The tourist admired them from the outside as they made merry in their comfortable quarters.

STRAW CEILING KEEPS HOUSES WARM AND DRY

Most of the new houses in the Sheep Creek community have straw ceilings, and some of the old houses have had straw ceilings put in this year. The fact was brought out in the demonstrations that the straw not only makes the houses warmer but it also takes up any excess moisture and keeps them dry.

A good example of the effect of a straw ceiling was pointed out in the demonstration at Jay Eckman's farm. His old gable-roofed house was cold and damp last year, with the result that the birds contracted colds and roup. This year the same house with a straw loft is comfortable, and the straw on the floor keeps perfectly dry. So pleased was Mr. Eckman with the straw loft in the old house that he put a straw ceiling in his new house built last summer.

HOUSE REMODELED AT LOW COST

One of the most interesting and helpful demonstrations was at the farm of Clark Jones, where an old house 14 feet wide had been remodeled by building out the front, making it 26 feet wide, and adding dormer windows. The total cost of the material purchased for rebuilding the house amounted to less than 50 cents per hen capacity. Only a dozen extra eggs per hen paid for the material used and the hens were comfortably housed.

A small house that needed remodeling badly and got it was used for the demonstration on the farm of J. F. Ray, northeast of Minatare. This house, 20 feet long and 10 feet wide, was 7 feet high in the rear and 9 feet high in front. The one-sash windows were too high for the sun to shine on the floor. The house was so narrow that sufficient ventilation could not be obtained from the front without a draft striking the birds on the roosts. The result was a cold, damp house and more or less trouble with colds. Mrs. Ray stated to the tourists that the moisture sometimes collected on the underside of the roof to the extent that it dripped down, and the straw on the floor was always damp. With a few hours' work and practically no expense for new material, the windows were lowered and muslin shutters made to occupy the spaces left above the windows. False rafters were dropped 2 feet below the roof. On top of these rafters old hog wire was placed and the space above was filled with straw. Mrs. Ray's hens now have a warm and dry house with plenty of light, even though it is still too narrow.

(Continued on page 80)

Organization Activities and Project Visitors

SECRETARY WORK and Commissioner Mead were at Orland on March 26. After a meeting with the owners of unoccupied lands regarding the plan for advertisement and sale of these holdings and following a trip through the irrigated area, the party was taken to Stony Gorge for an inspection of the construction work in progress at the dam. Accompanying the Secretary's party were the following: H. A. Brown, chief of the division of settlement and economic operations of the Washington office; W. J. Donald, secretary to Doctor Work; Garnett King, assistant passenger traffic manager of the Southern Pacific Lines; and W. A. Beard, vice president of the Iron Canyon Project Association.

Poultry Tour in North Platte Valley

(Continued from page 79)

SMALL FLOCKS RETURN GOOD PROFIT

One of the best-paying small flocks visited was at the Lester Kaasch farm in Lake Alice district. From 215 hens Mr. Kaasch sold last year 2,888 dozen eggs beside what were used at home. The eggs were sold at a premium locally, and the gross returns from this small flock averaged close to $100 a month for the year. Mr. Kaasch's equipment was modest but convenient and his house was comfortable and dry with plenty of light.

Mrs. John Jensen built a new poultry house last spring 20 by 36 feet. In six and one-half months, from March 12 to the end of September, her 140 Buff Orpington hens had returned her a net income just about equal to the entire cost of the new house. Her net income for October was $38.85 from 130 hens.

THE SUCCESS OF THE TOUR DUE TO LOCAL ORGANIZATION

The increased interest in poultry in Scotts Bluff and Sioux Counties is due largely to the work of the South Sioux Poultry Association. In fact, it was the members of this organization who originated the idea of a poultry tour. The ladies of the association served lunch to the tourists at Henry.

The county agents in the valley and D. H. Propps of the office of demonstrations on reclamation projects cooperated with the poultry association in planning and managing the tour.

Representatives of the commercial organizations in the valley participated in the tour and did much to make it a success.

On March 18 all of the visiting officials at the Denver Conference on Reclamation were guests of the Denver office employees at a banquet held in the Olin Hotel, with R. F. Walter, chief engineer, as toastmaster. Dr. Hubert Work, Secretary of the Interior, was present and gave an informal talk, stressing the solid basis on which the operations of the bureau are now being conducted.

Mrs. Florence Robbins is temporarily employed in the Denver office as junior clerk for the purpose of coloring soil classification maps for the Kittitas division, Yakima project.

Julian Alcala Buendia and Procopio Ferreras Eleazar, two students from the Philippine Islands, called at the Denver office several times during the month of March in regard to employment on one of the large construction jobs, and tentative arrangements were made with the construction engineer at Ellensburg, Wash., for their employment later in the season.

A. J. Sheldon, consulting metallurgist for the American Rolling Mill Co., of Middletown, Ohio, was a visitor on the Uncompahgre project from March 21 to 23. He inspected the High Mesa ingot iron siphon and the riveted pipe siphon across Dry Creek. Samples were taken by him for the purpose of making a microscopic examination, and report on his findings has been promised shortly.

W. G. Stewart was employed on the Boise project March 11–17 as an engineer to give expert testimony in the Boise River flood water case.

E. B. Darlington, superintendent of the Minidoka project, and B. E. Stoutemyer, district counsel, visited the Boise project during March.

Hugh L. Crawford, assistant engineer on the Minidoka project, resigned March 31, and was appointed manager of the Burley irrigation district.

W. A. Meyer, accountant and auditor in the Washington office, was on the Sun River project from February 28 to March 8.

J. R. Iakisch, associate engineer in charge of drainage work, visited the Lower Yellowstone project for several days during March in connection with preparation of drainage specifications.

R. R. Parrett, representing the Bureau of Indian Affairs, conferred with district officials on the Newlands project in regard to furnishing water to the Paiute Indian Reservation lands.

On March 16 the Colorado section of the American Society of Civil Engineers gave a dinner at the University Club in Denver, at which a number of the project superintendents and others were in attendance. Doctor Mead was the principal speaker.

W. W. Johnston, associate reclamation economist, arrived on the Yakima project on March 5 and spent a few days in going over the land of the proposed Yakima extensions.

A project office has been installed in the Nelsen Building in Vale, Oreg., Vale project. Chief Clerk Voyen is expected to report from Hermiston at an early date.

Pan Pacific Conference Honolulu, Hawaii, April 11-16

IN attendance upon the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, held at Honolulu, Hawaii, April 11–16, were the following representatives of the Department of the Interior:

Dr. Hubert Work, Secretary of the Interior.
Dr. John J. Tigert, Commissioner of Education.
Dr. Elwood Mead, Commissioner of Reclamation.
Hon. Stephen T. Mather, Director of National Parks.
William J. Donald, secretary to Doctor Work.
Theophilus Honour, secretary to Doctor Tigert.
H. A. Brown, chief of the division of settlement and economic operations, Bureau of Reclamation.
J. F. Abel, assistant specialist in foreign education systems, Bureau of Education.

The next issue of the ERA will contain a report of the conference, the only word having been received as the ERA goes to press being a radiogram from Mr. Donald telling of the safe arrival, in excellent physical condition, of the party in Honolulu.

U. S. GOVERNMENT PRINTING OFFICE: 1927

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards**, Assistant Secretary; **E. O. Patterson**, Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary; **J. H. McNeely**, Assistant to the Secretary; **W. B. Acker**, Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — George C. Kreutzer, Director of Reclamation Economics — P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	A. W. Walker		Miss E. M. Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr	H. C. Stetson	L. H. Mong	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	Adrian, Oreg	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [9]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg	H. W. Bashore	C. M. Voyen		B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	M. J. Gorman	E. M. Philehaum	R. J. Coffey	Berkeley, Calif.
Large Construction Work						
Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks [10]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [10]	Chas. Klingman	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [11]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam.	Augusta, Mont	Ralph Lowry [11]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [11]	C. B. Funk		R. J. Coffey	Berkeley, Calif.

[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.
[2] Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.
[9] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.
[10] Resident engineer.
[11] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise	Boise, Idaho	R. J. Newell	
Middle Rio Grande	Albuquerque, N. Mex	C. C. Elder	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.
Yakima project extensions	Yakima, Wash	J. L. Lytel	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.

A Profitable Crop on the Belle Fourche Project

I27.5: 1927

NEW RECLAMATION ERA

VOL. 18 JUNE, 1927 NO. 6

IRRIGATION ON A RECLAMATION PROJECT

Resolved, That the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, in Plenary Session assembled, upon recommendation of the Reclamation Section, affirms:

1. Its strong conviction that control of all water in rivers, streams, springs, lakes, marshes, and natural receptacles and water sources should vest in the Government.

2. The necessity of recognizing that the fundamental requirements of land settlement should be those that will assure the efficient and bona fide settler security of tenure, including extended terms of payment for the land, sympathetic assistance by means of advances of money for the preparation and establishment of the farm in its early stages, the providing, as far as practical, of social conveniences and means for recreation, and the encouragement in every way of individual effort and initiative

Resolutions concerning reclamation adopted by the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, held in Honolulu, Hawaii, April 11-16, 1927

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 JUNE, 1927 No. 6

Interesting High Lights on the Reclamation Projects

A RECENT issue of Yakima Valley Progress voices its faith in the valley as follows: With a construction program for the entire Yakima Valley amounting to $7,506,599 under way, with deposits in the city's four banks higher than last February, with irrigation conditions the best in years, due to 7.99 inches of precipitation since September 1, and with apples fully 75 cents a box higher than a few weeks ago, there can not help but be a healthy business condition this spring.

DURING the month 90 acres of trees were set out on the Yuma Mesa. This year's planting is expected to reach 200 acres.

ON the Grand Valley project practically all crops except beans, corn, and oats had been planted by the end of April. Prospects for the season continued favorable and soil conditions were particularly satisfactory. Both early potatoes and beets were showing through the ground and most of the alfalfa hay was making a splendid growth.

THE Chamber of Commerce of Montrose, Uncompahgre project, in cooperation with the Montrose Bar Association, has been giving consideration to the working out of a plan whereby several thousand acres of land east and southeast of Montrose will be drained and protected from future seepage. It is contemplated that this drainage work will be accomplished by open ditch.

THE Boise project reports exceptionally cold weather during the month of April. Four frosts listed as "killing" occurred during the month. Some damage was suffered by peaches and apricots. The sweet-cherry crop was being largely protected by smudge pots. The growth of crops has been less than normal. Spring grain, however, was in excellent condition.

GROUND has been purchased and is being prepared for the erection of a milk condensary at Burley. The organization promoting this undertaking is known as the Idaho Star Evaporated Milk Co.

STATEMENTS issued this spring from the two banks at Burley, Idaho, announce total deposits of nearly $13,000,000, an increase of about $200,000 over last year's total.

ON April 18 field headquarters for the Gooding project were established at Eden, a town of about 400 people on the first segregation of the North Side Twin Falls project. Commodious office and storage space was secured and the preparatory work of getting quarters arranged was immediately started.

PROBABLY the most important event during the month was the completion by the Utah Construction Co. of its contract and the formal delivery of the American Falls dam to the United States on April 20. For this occasion a number of those who had taken part in the work of building the dam assembled at American Falls, an informal celebration was arranged, motion pictures were taken, and the event was given wide publicity over the State and the country.

ON the North Platte project one of the worst snowstorms of record occurred from April 10 to 14. It was estimated that more than 2 feet of snow fell and the high wind drifted the snow into many deep drifts. All roads were impassable for several days and with the exception of the highway, were poor all month.

A FEELING of optimism prevails on the Newlands project, and the farmers are looking forward to a prosperous year.

TOTAL shipments from the Yakima Valley to the end of April amounted to 12,053 cars of apples and 7,826 cars of potatoes. Shipments for 1927 have made a good beginning with 10 cars of asparagus during the month.

ONE additional application was received for a farm unit on the Riverton project during the month of April.

ADVANCE reports from the Great Western Sugar Co. show intentions to plant 4,200 acres of beets on the Garland division of the Shoshone project this year, which is a 38 per cent increase over 1926. A similar increase is expected on the Frannie division. This crop looks unusually remunerative, as the company has practically guaranteed $8.50 per ton. Other row crops are also expected to show an increase this year except seed peas. The seed pea company operating on the Garland division is not contracting peas except varieties which are planted in rows, owing to overproduction in the canning industry.

DURING the month of April the Powell Creamery, on the Shoshone project, purchased 7,700 pounds of butterfat and manufactured 9,700 pounds of butter and 300 gallons of ice cream. Other ageneies purchased 5,000 pounds of butterfat. Ninety-six hundred pounds of cream were shipped from the Frannie division, of which 5,600 pounds went to the Powell Creamery.

PUBLIC notice has been issued by the Secretary of the Interior announcing an opening to entry on June 1, 1927, of 54 public-land farm units in part 1 of the Willwood division of the Shoshone irrigation project, Wyoming. Information concerning this opening may be obtained from the Commissioner, Bureau of Reclamation, Washington, D. C., or the Project Superintendent, Powell, Wyo.

Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation

Honolulu, Hawaii, April 11–16, 1927

THE Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, held in Holululu, Hawaii, April 11 to 16, 1927, presented an unsuual opportunity for an interchange of ideas by the countries bordering on the Pacific. Especial interest was shown by the countries participating in the activities of the reclamation section which dealt with the reclamation methods and policies of these countries and their contributions to our knowledge of special features of reclamation.

The program of the reclamation section comprised morning sessions devoted to the presentation of prepared papers and afternoon sessions for round table discussion. The following papers were presented:

Elwood Mead, Commissioner, Bureau of Reclamation: "The policies and problems of Federal reclamation."

William Cattanach, chairman, State Rivers and Water Supply Commission, Victoria, Australia: "Conservation and use of water."

Nils Olsen, Assistant Chief, Bureau of Agricultural Economics, Department of Agriculture: "Land-settlement policies and their relation to the development of a prosperous agriculture in the United States."

José Mares, National Commission of Irrigation, Mexico: "Irrigation projects and some problems connected with reclamation."

Frederick Krauss, University of Hawaii: "Difficulties of settlers. Aid and direction which should be given."

E. J. T. Manchester, president Water Supply Board, Brisbane, Queensland, Australia: "Proposals for the settlement of reclamation projects."

K. Kachi, expert Ministry of Agriculture and Forestry, Japan: "Land improvement and reclamation in Japan."

C. C. Teague, president California Fruit Exchange: "Cooperative organizations for the marketing of products from irrigated areas."

A. C. Hardison, director American Farm Bureau Federation: "The financing and operation of a cooperative rural community."

E. Torres Belon, Lima, Peru: "Policy of Peru in irrigation, autocolonization, and colonization of the country in the last six years."

Thomas H. Hunt, professor of agriculture University of California: "The achievements of a private land settlement colony. A report of progress."

Rev. Akaiko Akana, member Hawaiian Homes Commission: "The experience of Hawaiian Homes Commission in carrying out its work."

Gershon Agronsky, representative, Zionist Organization: "The agricultural settlement of Palestine."

Marhsall Dana, editor, Journal, Portland, Oreg.: "Problems of State and district reclamation."

In addition to the prepared papers, other topics for discussion at the round table were as follows:

1. The appropriate fields of public and private development in reclamation.

2. Conditions under which Government should undertake reclamation of privately owned lands, and methods which should be followed.

3. Factors which affect the value of water in irrigation and the maximum yearly outlay for water which irrigators can afford to make.

4. Where Government constructs irrigation works, which is to be preferred—Building the works by day labor or building by contract?

5. Devices for the measurement of water.

6. Losses of water from canals in distribution.

7. The settlement of land:

(*a*) Qualifications of settlers in the way of capital and experience.

(*b*) Time of payment for land and water.

(*c*) Advice and direction to be given.

(*d*) Extent of financial advances which are feasible and the methods by which they should be supervised.

It was gratifying to note that the attendance at the meetings of the Reclamation Section was not only sustained throughout the period of the conference, but increased from day to day, more than 50 persons being present on the last day.

The papers and discussions are being prepared for publication in the full report of the conference, which it is hoped can be made available for distribution within the next few months.

One of the interesting features of the conference was the visit to the island of Molokai by Secretary Work and Commissioner Mead to inspect the homestead settlements under the Hawaiian Homes Commission. Here 116 homesteaders are developing 40-acre farms and furnishing a striking example of what may be accomplished in bringing the Hawaiians back to the land. Near Hilo, also, on the island of Hawaii, 80 families, formerly tenement dwellers in Hilo, are living on 1-acre house lots, developing a community spirit and giving every promise of success.

On the return to San Francisco of the Secretary of the Interior, he made the following statement concerning the results of the conference so far as it related to the work of the Reclamation Section:

One of the important gains of the Reclamation Section of the conference was the personal contact of men holding responsible positions in the administration of irrigation laws in nearly all of the countries bordering the Pacific. These men know what their respective countries are endeavoring to do. They know the strength and weakness of their methods and the obstacles which have to be overcome in the conquest of aridity. I speak of irrigation because this is the form of eclamation made prominent at the conference.

The first two days were devoted to a discussion of the aims and methods of the different countries. Part of this discussion was the presentation of formal papers by administrative authorities, but the more valuable feature was the informal round table discussion which followed. There was general agreement that the engineering methods of reclamation by irrigation are now as well standardized as those of railroad building. Little attention was given to this, although there was surprise expressed at the engineering achievements in Federal reclamation in the United States which were presented in statistical tables, diagrams, and photographs that will be incorporated in the report of the conference.

The complex question of what authority should control the distribution of streams and the nature of the rights to be recognized therein had serious attention. It became apparent that the United States can learn much from what other countries are doing. The contrast between the continuous and costly litigation in California, which has recognized the doctrine of riparian rights, and the entire absence of water-right litigation in Australia, where this doctrine has been definitely abrogated and where there is State control of public water supplies and State administration of streams placed on a definite and working basis, suggests the need of further action on this matter in the United States. It is further shown by

the necessity for administrative control of streams throughout their length, where they pass through several States, as does the Colorado. A resolution of the conference—

"Affirms its strong conviction that control of all water in rivers, streams, springs, lakes, marshes, and natural receptacles and water sources should vest in the Government."

This was adopted unanimously, both in the Reclamation Section and by the conference as a whole. It discards the doctrine of riparian rights in favor of public control by the Government, State or National, of all water supplies.

All of the countries represented at the conference are finding it necessary to help settlers change raw lands into farms, and other countries are doing more in this direction than the United States. They give greater assistance in the preparation of the land for irrigation, in providing advances to help settlers equip their farms, and in giving advice and direction as to methods of cultivation, crops to be grown, and cooperation in producing and marketing. This matter is of such importance in the United States as to justify the wide publication of this resolution adopted regarding this feature:

"*Resolved*, That the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, in plenary session assembled, upon recommendation of the Reclamation Section, affirms the necessity of recognizing that the fundamental requirements of land settlement should be those that will assure the efficient and bona fide settler security of tenure, including extended terms of payment for the land, sympathetic assistance by means of advances of money for the preparation and establishment of the farm in its early stages, the providing, as far as practicable, of social conveniences and means for recreation, and the encouragement in every way of individual effort and initiative."

The papers and discussions at this conference of the different phases of reclamation by irrigation should be read and studied by the people of the western third of the United States. They show that while there is considerable variation in present economic methods, there is a remarkable agreement among those who hold responsible positions as to principles and policies which should be adopted.

The members of the Reclamation Section believe there should be a second conference at an early date. This one served to clear the ground for a more thorough study of certain legal and economic features of reclamation. The next one would have the benefit of the personal contacts formed at this one, of a better knowledge of what the different countries are seeking to do, so that the discussions of the conference could be centered in advance on vital issues. The information brought by the different countries on legal, economic, and social questions could be more complete and hence much more valuable to all those interested in the creation of a high type of rural civilization in the widely scattered and important countries which would participate.

New Water Law of Honduras

A new water law was passed by the National Congress of Honduras on April 9, 1927, to become effective on August 1, 1927, the beginning of the next Honduran fiscal year. The measure, as reported by Richard Ford, American consul at Tegucigalpa, Honduras, represents a considerable amount of research work on the subject by the permanent commission of the Republic, and is of particular interest as indicating the present trend of Honduras in the matter of placing its natural resources on a more or less government-controlled and economic basis. The following is quoted from chapter 1, on the "Ownership of waters":

"ARTICLE 1. To the State belongs the full ownership, inalienable and imprescriptible, of—

"1. The waters of the territorial seas which bathe its coasts and islands, in that width determined by international law, with its beaches and its coves, bays, harbors, ports, and other shelters which may be used for fishing and navigation.

"2. The waters of lakes, lagoons, estuaries, rivers and streams of constantly running waters, with the exception of article 3.

"ART. 2. To the State also belongs the ownership of fluvial waters which course over national lands, and of subterranean waters existing under the same.

"ART. 3. The following constitute private property:

"1. The ownership of the waters of currents which are born and die within one piece of property.

"2. That of fluvial waters while coursing over a private tract.

"3. That of subterranean water under a tract, reduced to possession by the owner of the same."

In general, as stated by Mr. Ford, the new water law may be summarized as a piece of legislation whose first object is the increasing of the country's revenue, and, secondly, the bringing of control of all national waters more into the hands of the government; and although not fully acceptable, in its present form to the majority of "company" interests, it is nevertheless considered by them to be of outstanding importance in the future commercial and economic development of the Republic.

Irrigation in the Punjab, India[1]

AT the opening meeting of the Punjab Engineering Congress on February 24, 1927, the president stated that in the irrigation department the event of the year was the opening of the Suleimanki headworks. This was the beginning of irrigation from the Sutlej Valley project, the largest irrigation enterprise in the world. This scheme will develop an irrigated tract equal to the whole of Egypt.

In 1901 the canals in the Punjab commanded 11,800,000 acres and annually irrigated 5,700,000 acres; these same canals now, with the same amount of water, will irrigate an area of 40 or 50 per cent more than they did at that time, due to increased efficiency in the handling of the water by the irrigation branch backed up by the intelligent development of the Punjab agriculturist.

The new canals which have come into operation since 1901 command 5,200,000 acres of land annually and irrigate 2,800,000 acres. The Sutlej Valley project has only just begun irrigation, but when in full operation the total area commanded from the Punjab rivers will be 27,500,000 acres, an increase of about 9,000,000 acres of irrigation over the 1901 figures. In addition, there are four projects awaiting sanction which, while improving irrigation in existing irrigated tracts, will command 7,700,000 acres more land and produce a further increase of 5,000,000 acres of irrigation annually. Then these projects are completed the Punjab river canals will command 35,000,000 acres and irrigate 19,000,000 acres annually at a capital outlay of under 50 rupees ($18) per acre irrigated annually, or less than the value of the crops raised.

A SURVEY of the farms on the Belle Fourche project shows that about 75 new families have settled on the project since the last crop season.

[1] From the Civil and Military Gazette, Feb. 27, 1927.

Stony Gorge Dam Dedicated With Appropriate Ceremonies

From the Orland Register, May 6, 1927

WITH every spot of vantage on the steep hillside covered with interested spectators, the first concrete for the $1,000,000 Stony Gorge Dam was poured last Tuesday afternoon. The ceremonies attending the pouring of the first yard of concrete mark the culmination of four years of active endeavor to secure for the Orland project a water supply which will be adequate for all time for the demands of the 20,000 irrigated acres within the Federal project at Orland. The dam, which has been under construction for the past six months, will be completed in the fall of 1928, so that the reservoir lake formed by the huge pile of concrete and steel will store 50,000 acre-feet of water for the irrigation season of 1929. This, with the storage at the completed East Park Reservoir, will give Orland a total of over 100,000 acre-feet of storage water.

Between 1,200 and 1,500 visitors from the Land of Orland and the towns of the Sacramento Valley viewed the ceremonies at Stony Gorge, which were arranged and entirely under the supervision of the Orland Chamber of Commerce. Special representatives were present from Sacramento and San Francisco, Chico and Oroville, Corning and Williams, while Willows sent an exceptionally large delegation to the event which means so much to the sister city.

Perfect weather and perfect arrangements made the day one of unqualified success. The caravan which left Orland promptly at 9.30, contained over 75 machines, and twice as many made the trip earlier in the day or, followed the caravan. At Willows, a score of county-seat machines joined the caravan for the trip to Elk Creek where picnic lunch was enjoyed at the school grounds.

DEDICATION OF STONY GORGE DAM, ORLAND PROJECT, CALIFORNIA

1. Dr. Mead and Miss Schnurr placing tablet. 2. Listening to the addresses. 3. From left to right: H. J. Gault, construction engineer; George Sturm, president, water users' association; R. C. E. Weber, project superintendent; William Cattenach, chairman, State Rivers and Water Supply Commission of Australia; R. C. Coffey, district counsel; Dr. Elwood Mead, Commissioner of Reclamation. 4. The tablet in place.

At 1 o'clock the crowd journeyed on to the dam site to view the work now under way on the $1,000,000 structure. Most of the work completed has been excavation for the necessary rock foundations and the completion of the modern construction camp by the Amberson Dam Co., who are the contractors for the big job.

At 2 o'clock the Orland municipal band gave a number of selections, following which the preliminary exercises were held in the flat to the northwest of the dam site. R. C. E. Weber, project manager and president of the chamber of commerce, was the chairman of the day. George Sturm, president of the water users and mayor of Orland, spoke briefly on the four years' fight to secure the necessary appropriation on favorable terms to make possible the construction of the dam. Mr. Sturm reviewed the need of the work, the enlisting of the support of men in Washington, and the long up-hill fight which finally led to victory. He completed his talk with a strong plea for closer co-operation for the public good by all men and women interested in the land of Orland.

John D. Coffman, district forester of the California National Forest, gave a short address, pleading for preservation of the forest from which Orland receives its supply of water for irrigation. A number of others were introduced and congratulated Orland on the cooperative spirit which had made possible the construction of the additional dam and reservoir.

Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, the guest of honor of the day, spoke but a few minutes, and pointed out the advantage of small acreages intensively cultivated which were made possible by such construction work as the Stony Gorge Dam. Doctor Mead, who is the foremost authority on irrigation in the United States and the father of the Durham colony plan, which in a modified form will be established in the Orland project under his personal direction, made no glowing promises for the future, preferring to bring about the prosperity of the coming decade by deeds rather than words.

Following the exercises, the ceremonies of pouring the first concrete at the dam site took place. George Sturm and R. C. E. Weber had the honor of mixing the concrete, and Doctor Mead aided in the pouring. To Miss Mae A. Schnurr, secretary to Doctor Mead and associate editor of the Reclamation Era, went the honor of placing the bronze plaque in the concrete, commemorating the event.

This plaque contained the following inscription: "Orland Chamber of Commerce, May 3, 1927. Non Nobis Solum." (Not for self alone.) This slab of concrete with the plaque embedded in it will be placed on the solid masonry at the top of the completed dam.

The entire program went off without a marring note and resulted in columns of publicity in the valley newspapers and the metropolitan newspapers of San Francisco, Sacramento, and Los Angeles calling attention to the fact the Land of Orland will have a water supply by the spring of 1929 which will be adequate for all demands in the years to come. The event was the biggest single piece of publicity ever attempted by a chamber of commerce of a valley town and the dedication exercises were of an order never before attempted by a community in the Sacramento Valley.

Distinguished guests present at the dedication exercises included the following:

Dr. Elwood Mead, Commissioner Bureau of Reclamation, Washington, D. C.

William Cattenach, chairman State Rivers and Water Supply Commission of Victoria, Melbourne, Australia.

Miss Mae A. Schnurr, secretary to Commissioner Mead and associate editor New Reclamation Era, Washington, D. C.

Richard J. Coffey, district counsel, Bureau of Reclamation, Berkeley, Calif.

Garnett King, assistant passenger traffic manager, Southern Pacific Line, San Francisco, Calif.

J. R. Mason, president J. R. Mason & Co., irrigation securities, San Francisco, Calif.

John D. Coffman, district forester, United States California National Forest, Willows, Calif.

R. L. Kimmel, manager agricultural and mining department, Sacramento Chamber of Commerce, Sacramento, Calif.

Irwin Engler, advertising and publicity, formerly secretary, Sacramento Chamber of Commerce, Sacramento, Calif.

Van Bernard, assemblyman, fifth district.

Bureau Annual Report Not to be Printed

Under authority of the act of February 23, 1927, the Secretary of the Interior has issued an order discontinuing the printing of separate annual reports by the Bureau of Reclamation, General Land Office, Bureau of Pensions, Bureau of Education, Geological Survey, and National Park Service. Manuscript copies of these reports will, however, be prepared as usual and will be on file in the Secretary's office for public inspection.

The purpose is to issue a consolidated report for the Secretary of the Interior, giving a readable, running account of the work of the department by bureaus and subjects without the mass of detail that has heretofore characterized the annual reports. The textual matter will be a generalization of the work of the bureaus and the principal statistics will be given in tabular form in the appendix.

Irrigating an orange grove

Average Gross Incomes Determined by Crop Census[1]

By Geo. O. Sanford, Superintendent, Sun River Project

THE following question was once given in a school examination, "Who discovered the Pacific Ocean?" and one boy, with more imagination than an intimate knowledge of history gave this answer, "The natives along the shore." It will have to be conceded that this answer is correct and yet there is something lacking. The natives along the shore most certainly did discover the Pacific Ocean, but they neglected to tell the world about their discovery and as a result some one else got the credit. From this little story we reach the conclusion that it pays to advertise and when one does something worth while, the next step is to let the world know. This is one of the reasons why we have a crop census on reclamation projects. Of all the statistical records kept there can be no question that the crop report is the most important and has been of the greatest assistance in giving a conclusive answer as to the benefits of reclamation and why the policy should be continued. With the passage of the act of December 5, 1924, the compilation of the annual crop census is a matter of still greater importance for the reason that on many projects this report serves as a basis for determining the annual construction installment to be paid by the water users.

COMPETENT ENUMERATORS ESSENTIAL

On projects operated by the Reclamation Bureau the responsibility of securing and compiling the annual crop census rests upon the project superintendent, and it is his duty to select competent men to get the information from the farmers. Experience has shown that the most effective means of accomplishing this result is through personal interviews with the landowners or water users who produced the crop. The best and most economical method of taking the crop census seems to be to select a trustworthy employee of the Reclamation Bureau, either a water master or ditch rider, and have him make a complete canvass of all farms in a given district, laying out a prescribed route so as to avoid unnecessary travel. It sometimes happens that it is possible to interview a number of farmers at some public sale or gathering in the fall of the year and secure from them the information desired, and by such methods considerable time and expense may be saved in picking up the loose ends of the crop census.

The census card should be carried in the field and information filled out in the presence of the farmer and if possible his signature secured, showing that the data have been prepared with his knowledge. If the farmer does not sign the card, it should be signed by the enumerator. It is also advisable to encourage the farmer to keep a similar record for his own information, and where desired it is well worth while to furnish him with a Government card in order that he may have a record of his annual farming operations. Occasionally the census taker meets with a refusal to furnish the desired information, and though there are cases where it may not be possible to secure the information from the man himself it is usually possible to secure most of the crop data from men who have worked on the farm as in the case of threshing crews, or from grain elevators, sugar companies, or shipping associations. Ditch riders generally have an intimate knowledge of farming operations and can also make very close estimates as to what crops have been produced.

DETERMINATION OF UNIT PRICES

The unit prices to be used in determining the value of crops must be obtained from various sources. In the case of small grains it is possible to secure accurate information from the local elevators, as they are usually willing to show their records covering the amount of grain purchased and the prices paid. Alfalfa is not so easily priced because on many projects only a small portion of it is sold and in all cases very little of it has been disposed of at the time the crop census is compiled. On projects where there are alfalfa mills the price delivered loose at the mill can be used to determine the value of hay in the stack. By the last of December it is usually possible to get a fair idea of the value of alfalfa, but if it should transpire that there is a marked increase or decrease in price of the unsold portion of the crop it may then be necessary to revise the annual crop report. This condition prevailed on several of the Montana projects in 1920, and before all crops were sold on Sun River project there was an average decrease of $10 per acre in the average acre income for that year. It is always desirable to confer with the commissioners of the irrigation

[1] Address delivered before Reclamation Conference in Denver, March 16–18, 1927.

Strawberry patch on the Yakima project, Washington.

district for the purpose of getting their ideas as to unit prices and wherever possible an agreement should be reached, but the final determination must rest with the officials of the Reclamation Bureau.

The value of pasture on projects is a question on which there is not only a considerable difference of opinion but a wide range in the value of pastures depending upon whether they are native grass or a well prepared mixed grass pasture. At the time the crop census is taken the area and value of each pasture should be secured from the owner and from these figures the average value figured for the entire project, and in this connection it may be well to mention that a mixed grass irrigated pasture is frequently one of the most valuable portions of the farm.

PRELIMINARY CENSUS OF VALUE

It has been found to be of considerable value on some projects to take a preliminary crop census sometime in June for the purpose of determining about how much land is in cultivation and being irrigated. At that season of the year there is usually not a very strong demand for water on northern division projects and there is ample time to get the information without additional expense. It has been found that information relative to cropped areas is more readily furnished at that season of the year than in the fall after crops are harvested, and it is quite interesting to make a comparison between the areas covered by the June report and the final crop census. It quite frequently happens there has been a reduction in the area reported to be in crop.

CHECKING THE RETURNS

Another matter of considerable importance in this connection is a rather intimate knowledge of what each farmer has been doing during the irrigation season so that if there is an apparent erroneous report as to the yield on any particular field it can be detected. It is admitted that any water user may be able to make slight reductions in reporting crop yields, but to get by with any radical change is a matter that is very apt to be discovered, and furthermore, the man who is willing to submit returns with a small percentage of error stands a pretty good show of eventually being found out and the resulting slight financial gain to him is far out of proportion to the unenviable reputation he thus brings upon himself. Although it is well to have confidence in the integrity of the farmers on the project, there can certainly be no harm in using ordinary methods in checking up crop reports which can be done with the operators of threshing machines, elevator men, mill operators, and others. Where there seems to be some cause for believing the returns are not correct, such cases should be given further detailed consideration. On all of the projects alfalfa is one of the most important crops, and it will have to be admitted that the methods used to determine the quantity of hay produced are usually rather crude. Often it is only an estimate of so many tons per acre. It would be quite a task to measure every stack of hay on a project, but it might be advisable to measure the alfalfa on a few farms for the purpose of determining the probable percentage of error and applying this to the reported returns of the entire crop. One case on Sun River project showed 20 acres of alfalfa yielding 2 tons per acre. The hay was measured in the stack and computed to be 46.6 tons, or an error of 16.5 per cent. If this percentage were applied to the entire crop it makes an increase in the average value per acre for the season of 1926 of 46 cents, or an increase in the annual construction charge of 2 cents. This sounds like a very small amount but it means an increase of $800 in the annual installment on a project of 40,000 acres.

The crop census cards have been of great value to the Reclamation Bureau in determining whether there is reasonable ground for granting relief in some particular case, and the figures showing the total value of crops produced each year have proved the best evidence that can be used.

A RECORD OF ACCOMPLISHMENT

As has been the case in the past, the chief future value of the crop reports on reclamation projects is the definite showing of what has actually been accomplished in the way of the production of new wealth. When the returns of all of the projects have been compiled the results are really startling and there can be no question that these crop reports have had more influence in securing congressional appropriations for continuing construction work than any other argument that could be presented. Furthermore they are accurate and reliable, more so perhaps, than any other crop reports prepared under the supervision of the Government, and yet when we consider all the figures it is quite natural to ask why the average showing is not any better. It does not require much energy or ambition to reach only the average class. We must look to the farms that stand at the top of the list, find out what crops they have produced and the methods that have been followed, and then make an effort to have equally good crops produced on every farm. And here again the crop census gives us some very valuable data on which to base a program for bringing about a marked increase in the prosperity of our reclamation project farms.

Tornillo Canal and sluice gates, Rio Grande project, New Mexico-Texas

Poultry Production a Growing Industry in Western Colorado

Western Colorado Poultry Show to be held at Delta in January, 1928

By G. W. Dyer, Horticulturist and Pest Inspector, Cedaredge, Colo.

NOW that a satisfactory settlement has been perfected whereby the more serious burdens of the Uncompahgre project have been at least partially removed, settlers have a right to hope for a period of prosperity. I hope that it will not be considered out of place for a believer in the lowly hen to suggest that poultry is one of the very sure helps to success. The hen and the cow have pulled many a section out of a plight much worse than the Uncompahgre has faced. Here we have the advantages of the best climate and soil, with ample water now assured and with the help of poultry, we will be able to begin anew to build up a section greater than many others that have heretofore succeeded.

We have among us one of the most capable poultrymen obtainable, H. A. Ireland, county agent, Montrose County, who has been our valued secretary since the beginning of our association, an advantage not possessed by every community, and no one man is more responsible for the growth and development of the poultry industry than he.

I do not favor a headlong rush into the game without due and careful consideration; quite the contrary. I would advise those who are not entirely familiar with the production of poultry to begin in a very modest way, then gradually build up vigorous and productive flocks.

Purebred flocks are always preferable to mixed breeds from any standpoint. Eggs from mixed flocks never have and never will bring profitable or satisfactory prices, mainly because they lack uniformity in shape and color which consumers of fancy eggs demand. They must also be absolutely clean. We people of Colorado have much to learn before we can hope to secure the top prices realized by other producing sections.

PROFITABLE TURKEY SEASON

Just now we are enjoying a most prosperous experience with turkeys, the natural outgrowth of our organized effort to boost the poultry industry on the western slope. The market has been unusually favorable for a period of years, but naturally we must expect to encounter off years occasionally. Favorable conditions for growing this valuable bird are permanent with us; therefore there is no good reason why we will not eventually become one of the greatest turkey-producing sections in the entire West.

Probably there is no better way to encourage this enterprise than to begin at once to prepare for our next big western Colorado poultry show in Delta next January. We are working for the biggest exhibit of turkeys ever shown in Colorado. Begin now to give your young stock every attention, so that they may become blue-ribbon winners. We are enlarging our classes and our premiums, and our show is now an established success. Those who have not heretofore exhibited should plan to do so and bring their best. Hundreds of splendid sales are made each year at the show because fanciers are learning that it is far better to make their selections from our exhibits, where they can see what they are buying, than to send to unknown breeders and pay perhaps double the amount charged for better stock here. Western Colorado has as fine poultry as any section, and the money, amounting to perhaps thousands of dollars which is sent out of the country each season for stock, eggs, and baby chicks, could be used to better advantage at home.

In the early days of our first regular shows those of us who took the trouble to exhibit our birds did so because we were partial to some fancy breed. It was largely a matter of pretty feathers. The fact that the breed we fancied was practical did not enter largely into the matter. We were regular old chicken cranks. Our entries were few in number and our attendance even less because there was little interest.

EGGS OF MIXED FLOCKS BRING POOR RETURNS

Business men could not be persuaded that there was anything in poultry. They argued that eggs were an unprofitable commodity anyway. Mixed flocks of scrub hens naturally produced (if they produced at all) eggs of a conglomeration of shapes, sizes, and colors. These were gathered when convenient; if not, well, eggs were eggs anyway, regardless of age or condition, and all went to town in the same basket. Can we blame the merchant for not enthusing over the possible increase of such an undesirable commodity?

Our association began to realize that we had a real mission. We had to encourage more practical methods, more standard breeds that were capable of producing more eggs per hen, eggs that were uniform in shape and color, and something that would attract the eye of the consumer and compete with other sections. Mixed flocks must go. Conditions gradually improved, outside buyers came in, and clean uniform eggs became a cash product.

DELTA, PERMANENT HOME OF WESTERN COLORADO POULTRY ASSOCIATION

In those days we arranged to hold our annual shows in Grand Junction, Montrose, or Delta. Our success was not flattering, though our admission fee was small, and our attendance was smaller. Delta first saw the light and responded in a more hopeful way than the other towns and gave us our first real encouragement. I well remember that our first outside help came from Dr. A. E. Miller, who was an interested visitor. He said: "Boys, you are doing something worth while; every business man in Delta should see this exhibit. Just give me 50 tickets and I will see that the business houses are represented." He sold the tickets with the distinct understanding that they must attend in person and boost for the success of the show, which they did, and we soon felt the influence of the wider interest and consequently outgrew our cramped quarters, a small room on a second floor. This gave us our inspiration to make Delta the permanent home of the Western Colorado Poultry Association, and we further decided to make it more educational by selecting the most thoroughly competent judges we could secure. The agricultural college sent their poultry expert to deliver a series of lectures each day of the show, and the effect was spontaneous. We made everything free; no admission fee, no membership dues. Again interest increased. Then our county commissioners visioned the possibilities of our efforts and came to our financial assistance, realizing that hundreds of farmers would be encouraged to add poultry as a source of additional income.

As a still further inducement we gave back all entry fees as premiums to the exhibitors and, contrary to precedent at that time, we established production classes, having discovered that there were many who hesitated to show their birds against what they termed experienced

breeders. Production classes gave them an opportunity of participating without coming in direct competition with standard-bred fowls, and this oportunity encouraged them to make their first exhibit. As a conseuqence to-day most of these same people are among our best and most successful exhibitors of standard breeds. They have learned that a standard-bred bird is capable of high egg production if bred along proper lines and having access to egg-producing foods.

BOOSTERS MAKE POULTRY INDUSTRY PROFITABLE

As a result the Delta County Chamber of Commerce took a very decided stand in our favor and every member saw the necessity of lending his influence. They talked poultry, attended our meeting, and became our most ardent advocates. Practically every professional and business man is a regular attendant at our shows, a booster, who takes a genuine pride in our success, not only from a financial standpoint but because he realizes that he has been largely instrumental in making poultry a profitable enterprise for western Colorado.

I recall that W. E. Gaylord, a noted breeder of Reds, marveled at our showing of over 600 chickens, 70 turkeys, and our overflow of visitors that taxed the capacity of the big Armory Building, and asked: "What is the secret of this wonderfully successful show?" On the following day in the Grand Junction Sentinel he stated: "Before the day was over I learned the secret. One of our number counted over 200 visitors in the building at one time; 150 attended Professor Ufford's lectures on the phases of poultry keeping. Six hundred specimens of choice poultry and 78 turkeys—three more than were at the National Stock Show. Why all this enthusiasm? Simply because their county commissioners, chamber of commerce, business men, lawyers, and doctors were there and had a full realization that the poultry industry is one of the big things that can help the farmer and keep his head above water during these trying times." Mr. Gaylord made no mistake and his surmise is correct. Delta, with her characteristic energy, approved of our show, and by so doing has assisted materially in building up a new and important industry on the western slope.

Edward T. Barber, agricultural editor of the Grand Junction Sentinel, says: "The poultry business in Delta County has assumed such proportions that it heads the list of profitable lines of industry. Shipments last year totaled 15 cars of chickens and eggs and 12 cars of turkeys, to the value of $300,000. This enormous business was built up by the united efforts of all other lines of business cooperating with the poultry men and encouraging them in every way. It pleases the merchant because the poultry men can either pay cash or meet their bills promptly at the end of the month; it pleases the banker because the poultry men are as good risks as the stockmen, the sheepmen, the hog men or the beet farmer; and it brings in three or four hundred thousand dollars that is pretty evenly distributed among all classes."

Project Water Supply

Generally, an abundant irrigation supply is assured for the coming season. Weather conditions in April have served to retard the run-off and will insure good flows extending far into the irrigation season.

The Belle Fourche, American Falls, and Arrowrock Reservoirs are being operated in a way to provide a certain amount of flood control and mitigate flood damage.

On the Carlsbad project in New Mexico storage on hand is about sufficient to supply the irrigation demands for May. With the snowfall in the watershed area below normal, future supply will be dependent on rainfall.

The Okanogan project is assured of a better supply than for some years past.

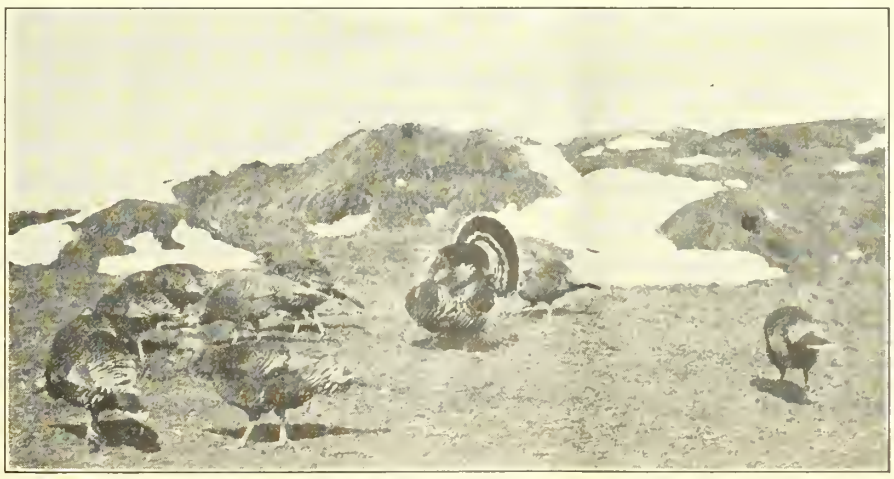
The results are all the more startling when one considers that only three or four years ago the shipments were practically nil. I feel that we are just getting nicely started in this industry. There is practically no limit to what can be done in this line of enterprise, with thousands of acres of cheap land that are especially adapted to turkey raising, and our generally dry seasons which are ideal for young poults. Apparently there is no limit to the demand for high-class turkeys that are produced here. The work is not laborious; they care practically for themselves after the first week or two, and on a good range the feed bill is negligible.

We do not hope to realize extreme prices each year for, like any other product, poultry will have its ups and downs; but with its constantly increasing use as food I do not anticipate in the immediate future that prices will be so low as to occasion a loss. Demonstrations by competent turkey raisers have proven that satisfactory profits have been realized at 21 cents.

I do not hesitate to prophesy that before many years the great Uncompahgre Valley will be devoted largely to the production of turkeys, chickens, and eggs, and that it will be compared with the Petaluma district, where over 51,000,000 dozen eggs were produced and 1,400 cars shipped at unbelievable prices to eastern markets last year. Add to this the vast amount that will be derived from our high-grade turkeys and consider what it will mean to Montrose, Olathe, and Delta. It truly is the "billion-dollar industry."

POULTRY EXHIBIT—DELTA ARMORY—JANUARY, 1928

Join with us in making our next show at the Delta Armory next January the biggest and best poultry exhibit in the West. More coops have been ordered, so there will be room for all. It will be a double-decker next time. Judge P. M. Pierce, of Denver, will again place the ribbons. This means that if your birds win a ribbon they are no longer just chickens; they are aristocrats, and their selling value is enhanced many times.



A few of Mrs. Howard Lathrop's flock of turkeys

The Boise Project and the Hen

By J. H. Lowell, Caldwell, Idaho

THE cattle and sheep men, the wheat and alfalfa farmers, the potato and fruit growers, the swine breeders, and dairymen, who developed and made productive the Boise project, could hardly have foreseen that so common an object as the farmyard hen could develop into an industry rivaling their own, and add greatly to the farmers' returns without diminishing the opportunities for other forms of agriculture.

Even the most enthusiastic poultrymen have been surprised at the rapid development which has been made possible not only by the highly favorable climatic conditions, the cheapness and ease with which suitable feeds can be raised, but also by the building of efficient marketing organizations insuring good prices for both poultry and eggs.

A modern poultry feeding plant at Caldwell, Boise project, Idaho

EGG INDUSTRY INCREASES

Not many years ago Idaho imported eggs. By 1921 the egg industry had grown until in that year 13 cars of eggs were shipped out of the State. In 1926 there were 268 cars. About one-half of the shipments originated in Caldwell, the assembling point for the Boise project eggs.

COOPERATIVE MARKETING OF EGGS

The first real attempt to stabilize the local egg market was by the formation of the Idaho Egg Producers' Association, a cooperative enterprise established in 1921. In 1924 the organization shipped for its members 69 carloads of eggs, valued at $220,000. In 1926 the association marketed 101 carloads of eggs, making returns of $360,000. This association handles eggs throughout southern Idaho, but about three-fourths of its business originates at the Caldwell station. Well-established concerns are also buying eggs, competition is keen, and there is a well-established cash market

DRESSED POULTRY

The development of poultry feeding and the shipment of dressed poultry have been even more rapid. Three years ago the market for poultry in this section was almost nonexistent. There was, of course, some local demand and some shipments of live poultry were sent out of the State. During the past two years there has sprung up a poultry feeding and shipping business to the extent that Caldwell firms during the year 1926 paid to poultry producers over $850,000 and handled an aggregate of 2,500,000 pounds of poultry.

TURKEY GROWERS UNITE

Included in the above is what is known as the "Turkey Pool." The turkey growers of southern Idaho are united into a cooperative organization and each year sell their product to the highest bidder for cash. Last fall one Caldwell firm purchased the entire pool, paying to the growers $375,000, or around 40 cents a pound. Idaho turkeys have established their reputation in the big markets of the East.

FEEDING DE LUXE

In order to prepare the poultry for market two strictly modern establishments have recently been erected in Caldwell. In these palatial homes the hen may end her days in luxurious feasting, cared for by trained attendants and served by dieticians and chefs. The result is all that any reasonable hen could ask for or that could be desired by any New York or Philadelphia epicure.

The plants now in operation have a capacity of 40,000 birds. The feeding period ranges from 5 to 10 days, so that about 6,000 fatted fowls may be put on the market each week.

Farm flock on the Boise project, showing type of chicken house in general use

INCUBATORS AND CHICKS

The time of the modern hen is too valuable to spend in raising a family and the "settin' hen" would be as old-fashioned as a sunbonnet. But chicks must be hatched and raised. Two years ago there was not a commercial hatchery in this territory. There are now commercial hatcheries using mammoth incubators with an estimating annual capacity of 1,800,000 eggs. Besides this, there are numerous smaller hatcheries and farm incubators.

POULTRY DEPARTMENT AT STATE UNIVERSITY

A rapidly expanding business such as the poultry industry, which requires skill and special knowledge in all its departments, must have expert guidance and advice to be successful. Fortunately this is supplied in Idaho through the extension department of the State University, and especially in the person of Pren Moore, specialist and director of the poultry department. Expert knowledge, practical skill, resourcefulness, tact, hard common sense, enthusiasm, the capacity for hard work, all make Mr. Moore invaluable in keeping the egg and poultry business on a safe, scientific, and profitable basis.

EGG DAY

In the summer of 1923, 20 or 30 of the egg producers on the project, in cooperation with the Kiwanis Club of Caldwell, conceived the idea of driving around to some of the farms and inspecting the poultry houses and then eating a picnic lunch with their families at the park in Caldwell. This established the first "Egg Day."

The picnic was repeated each year, growing rapidly in numbers and interest, and there was added a program, egg exhibits, and prizes for the best egg records.

DISTINGUISHED GUESTS

The governor of the State each year gave the address of welcome, and last year, in addition to the governor, Secretary of Commerce Hoover and Senator Borah were both on the program, Mr. Hoover giving the principal address. The program and the speeches were transmitted through amplifiers and broadcast.

FIFTH ANNUAL EGG DAY

This year the fifth annual egg day, to be held the latter part of June, again assumes national importance from the fact that Louis J. Tabor, master of the National Grange, will be the principal speaker.

German Credit for Colonization

GERMAN agricultural and social leaders have organized meetings recently to discuss the question of colonizing farmers from overcrowded districts in sparsely-populated sections of Germany and to explain the plans to the farmers. East Prussia and Pomerania in North Germany have been chosen as the most suitable places for colonization of farmers from southwest Germany.

According to the Federal colonization act of August 11, 1919, there has been set aside for the purpose of the act a total of 3,470,000 acres in East Prussia, Pomerania, Brandenburg, Silesia, Schleswig-Holstein, and Saxony.

In the promotion of colonization in these sections, the Reichstag appropriated a credit of $59,500,000 on July 1, 1926, to extend over a period of five years. This is intended to provide for an annual colonization of from 6,000 to 8,000 colonists. In order to exploit the present favorable opportunity for colonization the sum of $3,570,000 has been approved for immediate use.

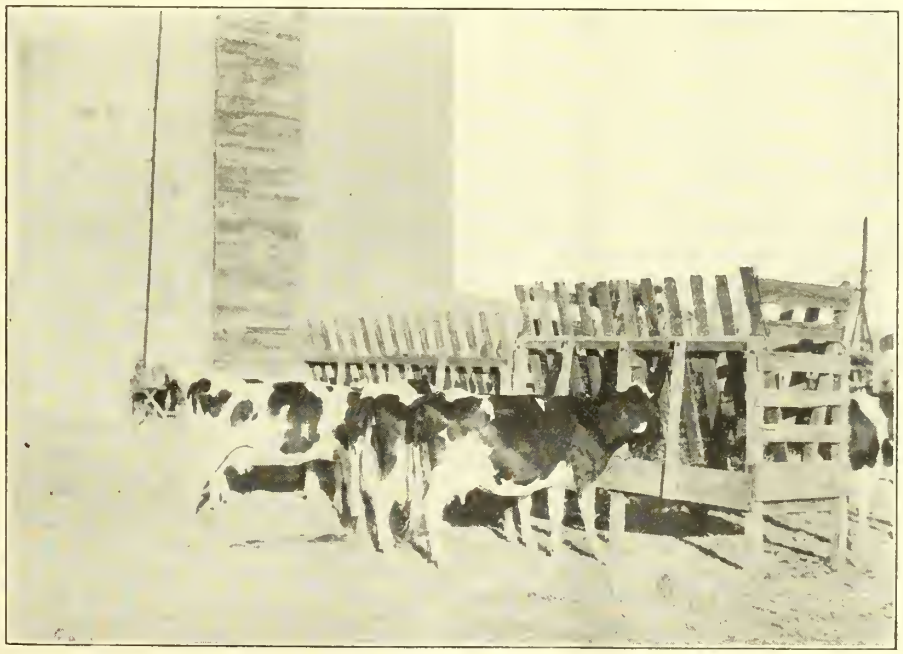
Enough land will be alloted to settlers to guarantee a livelihood. Where the soil is good, from 40 to 50 acres will be turned over to each settler, and where the soil is poorer, the size will vary between 70 and 80 acres.

Hitherto each settler has been required to have a cash capital of about $1,200. As many prospective colonists are not in possession of the stipulated capital, both the Reich and the States have reduced the interest rates on the loans so that skilled farmers, although poor, may derive benefit from the land offered by the Government.

ACTIVE SUPPORT EXTENDED TO SETTLERS

It has been estimated on the basis of past emigration that during the next decades from five to six villages, each comprising 40 to 50 farmers from southwest Germany, will grow up annually in northern Germany. The general scheme of the project includes the organization of a cooperative colonization association with its seat in Stuttgart, to be known as the South German Cooperative Association for Colonization in North Germany. The colonization company is to erect the dwellings and outhouses at an approximate cost of about $2,500 for each place.

Tle colonization project has for its chief aim to render relief to the congested agricultural sections in Germany, but a predominant factor is also to reduce emigration as much as possible by giving indigent farmers an opportunity to make a living in their native land.



Registered cows on the Rio Grande project, New Mexico-Texas

Contracts with Irrigation Districts[1]

By B. E. Stoutemyer, District Counsel, Portland Oreg.

DURING the past two years contracts have been prepared, negotiated, approved by the department, voted by the electors, and executed by the districts and the Secretary of the Interior in connection with the following irrigation districts in the northwestern legal division:

Burley irrigation district, Minidoka irrigation district, King Hill irrigation district, Nampa-Meridian irrigation district, Boise-Kuna irrigation district, Wilder irrigation district, New York irrigation district, Black Canyon irrigation district, Big Bend irrigation district, Gem irrigation district, Owyhee irrigation district, Slide irrigation district, Payette-Oregon Slope irrigation district, Warmsprings irrigation district, Vale (Oreg.) irrigation district, Hermiston irrigation district, West extension irrigation district, and Kittitas reclamation district.

In addition to the contracts referred to above, which have been completed, contracts have been prepared and are now pending with the following:

Okanogan irrigation district (two contracts, one for construction of power plant and one for adjustment of charges), Black Canyon irrigation district (for construction of Payette division of the Boise project), and the American Falls Reservoir district No. 2 (for construction of Gooding project).

The contracts with the Kittitas reclamation district, and the Warmsprings, Vale, Oregon, Owyhee, Gem, Payette-Oregon Slope, and the Slide irrigation districts, and the contracts now pending with the American Falls Reservoir district No. 2 and the Black Canyon irrigation district are for new projects. The other contracts referred to above are with various districts on old projects.

In addition to the contracts referred to above, Warren Act contracts have been made with a large number of irrigation districts and some irrigation companies in connection with the American Falls Reservoir. These Warren Act contracts in connection with the American Falls Reservoir differ from the ordinary Warren Act contracts mainly on account of the fact that the parties cooperating with the Government in the construction of the American Falls Reservoir are paying in advance for their share of the reservoir. So far as I know, the advance-payment plan has been adopted only in the case of the American Falls Reservoir and the enlargement of the Jackson Lake Reservoir.

We find on each of the reclamation projects some conditions differing from those on any other project, and in each of the contracts above referred to there are a number of paragraphs which are peculiar to the district and project in question and which deal with local conditions. But there are also a number of provisions which have become well established as standard provisions in such contracts and which are usually included in all cases.

Prior to the time that the recent contracts were made with the various irrigation districts in the State of Idaho, conditions were very unsatisfactory. Large sums were coming due each year as construction and operation and maintenance payments, but in most cases the payments were not being made and the delinquent charges had accumulated to astonishing proportions. On projects where the water users' association or other settlers' organization had no responsibility and nothing to do except agitate for relief from payment, agitators came into prominence and were elected on the boards of directors.

IMPROVED CONDITIONS

Since the new contracts have been made each of the Idaho districts has met its agreed construction charges in full and is collecting its own operation and maintenance charges in advance, and where district elections have occurred the water users have elected directors who are constructive and conservative in their attitude. Under the adjustment contracts referred to above the construction payments accruing each year are not so large as they were under the old individual contracts, but the payments actually made are larger than under the former plan, and there has also been a vast improvement in the relationship between the water users and the Government on these projects; and a spirit of cordial cooperation now prevails where formerly there was suspicion and controversy.

This change is not altogether due to any one thing, but the fact that this marked change has occurred in so many different districts on several different projects indicates that the change is not altogether accidental but due, in part at least, to the change which has been made in the form of organization, the provisions of the contract between the water users and the Government, and the manner of operating the works.

On the Boise project, where a number of these districts are located, the year 1926 was a year of water shortage, with crops below the average, so that on that project at least the improvement in the relationship between the Government and the water users is not due to any especially favorable natural conditions during the past year, but is in spite of an unfavorable water situation. One trouble with the former arrangement prevailing on the Boise project (and on many other reclamation projects) was that the Government was attempting to do business on an individual basis with each of the thousands of water users, both in the matter of operating and maintaining the ditches and laterals and in delivering water to individual water users, and also in the matter of collection of charges.

OPERATION OF LARGE WORKS

The Federal Government is well adapted for the operation and maintenance of large reservoirs, especially in cases where one reservoir, or one system of reservoirs, serves a number of different projects. This is also true of large diversion dams or other structures which serve several different districts. In such cases there is usually more or less jealousy between the several districts, or several projects, which use the same reservoir or same system of reservoirs, and no district or project is willing to trust the operation of the reservoir on which it depends for its water supply to a rival district or project. The Government furnishes a convenient and disinterested organization for operating the reservoirs and large diversion works in such cases, and has had a large experience in the operation of such works. Congress seems to have had this distinction between the operation of the large reservoirs and the operation of the ditches and canals in mind even at the time when the original reclamation act was passed, for it was provided in section 6 of the act of June 17, 1902:

> That the title to and the management and operation of the reservoirs and the works necessary for their protection and operation shall remain in the Government until otherwise provided by Congress.

But the Federal Government is not well adapted to the operation of ditches and laterals and the delivery of water to individual water users. The same principle seems to apply, too, with reference to the operation of power plants, where the best success has been obtained by the Government in operating the power plant but delivering the power at wholesale either to municipalities, such as the cities of Burley and Rupert, or to companies organized to distribute the power to the individual users.

[1] Paper read before the reclamation conference at Denver, Mar. 16-18.

OPERATION OF CANALS AND LATERALS

Secretary Work early adopted the policy of favoring the turning over of operation and maintenance of ditches and canals to the water users' organizations, and subsection G of section 4 of the fact finders' act provides, in part, as follows:

> That whenever two-thirds of the irrigable area of any project, or division of a project, shall be covered by water-right contracts between the water users and the United States, said project shall be required, as a condition precedent to receiving the benefits of this section, to take over, through a legally organized water users' association or irrigation district, the care, operation, and maintenance of all or any part of the project works, subject to such rules and regulations as the Secretary may prescribe, and thereafter the United States, in its relation to said project, shall deal with a water users' association or irrigation district.

Under the adjustment act of 1926 the above requirement of the fact finders' act was waived and it was left to the discretion of the Secretary to determine whether adjustment contracts under the act of 1926 should or should not provide for operation of irrigation works by the water users' organization. But up to the present time no contracts have been made in the northwestern legal division under the adjustment act of 1926 except for the construction of new projects, and the contracts for new projects have provided for the operation and maintenance of all or a part of the irrigation works by the district.

The adjustment contracts made in Idaho were made under the fact finders' act and in all cases required the districts to operate and maintain the canals and laterals, but the Government reserved the operation and maintenance of large reservoirs, such as the American Falls, Jackson Lake, and Lake Walcott Reservoirs on Snake River and the Arrowrock on the Boise River, and this was also true of the principal diversion dams where the dam serves more than one canal system. The same plan was followed in the contract with the Kittitas reclamation district, the district agreeing to operate and maintain the canal system, the operation and maintenance of the reservoir system being left to the Government.

Placing the responsibility for the operation and maintenance of the canals and laterals on the district, and also placing on the district the responsibility for making collections and for the payment of a lump sum to the Government, tends to develop a constructive and conservative attitude on the part of the water users. The water users, knowing that they must depend on the directors that they themselves elect for their water service, usually select good men, and under responsibility even the radicals tend to become conservatives. This is one of the factors which is partly responsible for the improved conditions on the Idaho projects since the new contracts were made.

DISTRICT ORGANIZATION NECESSARY

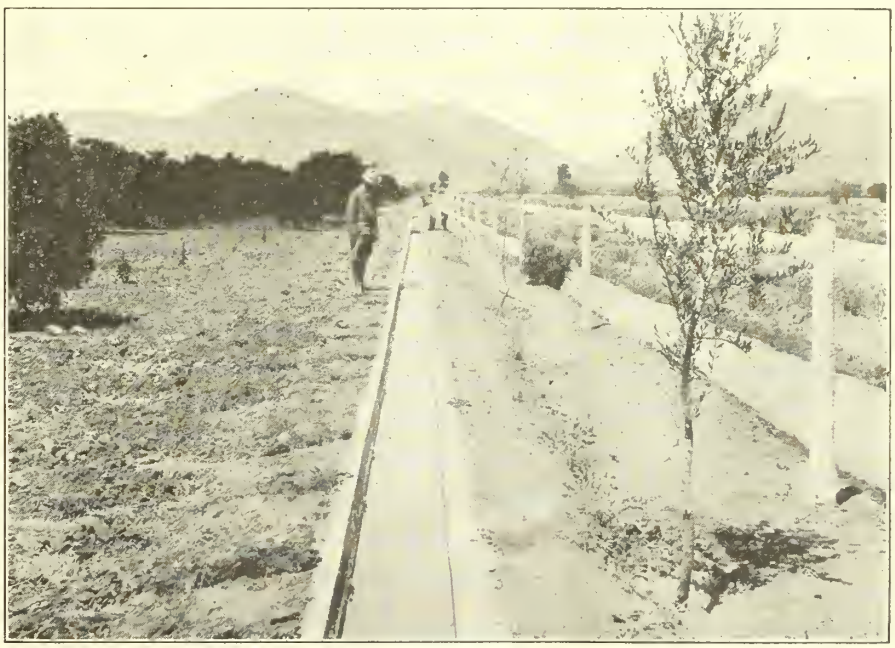
The Secretary of the Interior also very wisely adopted the policy of making adjustment contracts on the projects in the Northwestern States only with irrigation districts. Every division of every project in Idaho, Oregon, and Washington is now organized as an irrigation district. The Tieton division of the Yakima project still functions for some purposes through a water users' association, but an irrigation district has been organized and covers the same territory covered by the association. The Tieton division of the Yakima project is the only remaining division of any of the northwestern projects which now functions even to this limited extent through a water users' association.

By the use of the irrigation district form of organization the taxing power of the district is made available to assist in the collection of charges and the collection is also placed on a more automatic basis. In place of the guarantee given by the water users' associations there has been substituted a direct agreement by the district to pay the construction charges and also the charges for the operation of the reserved works in a lump sum, which obligation is a general obligation of the district; and provision is made in the contract for making assessments sufficiently large to provide a reasonable margin to cover such delinquencies as may be anticipated from past experience. This change is also, in part, responsible for the improved conditions.

So far as I can learn, the guarantees given by water users' associations were never of any practical effect except in the case of the Orland association. In that case it is my understanding that, while the contract provided for a guarantee by the association, the association voluntarily treated the contract as one providing for a direct obligation on the part of the association to make payments in a lump sum for the entire project. In other words, in the case of the Orland association the association voluntarily adopted the policy of making collections and payments on much the same basis which is now required under the new contracts with irrigation districts; that is, the association itself made the payments for the entire project in a lump sum and levied assessments with a sufficient extra amount to cover reasonable allowance for delinquencies.

COLLECTION OF CHARGES

While the new contracts provide for collection of charges by means of the taxing power of the district, the right to enforce payment by withholding delivery of water is not waived, but, on the contrary, the district is required to use all available means of collection, including both the use of the taxing power and the withholding of delivery of water from those who are in arrears more than one year. The contracts also contain a provision under which the amount of water delivered to the district may be reduced in proportion to delinquencies.



Concrete lined lateral on the Salt River project, Arizona

On each project there are many details which must be covered by special provisions in the contract, but, as I see it, the provisions above outlined are the main general provisions common to all of the contracts where improved conditions have resulted from the making of a new contract. Our experience indicates that important points to be covered by such contracts include the following:

(*a*) The contract should be with an irrigation district so that the taxing power may be available to aid the organization in making the necessary collections.

(*b*) The contract should require the use of all means of collection, both by the exercise of the taxing power and by the exercise of the right to withhold delivery of water in cases where payments are more than one year in arrears.

(*c*) The contract should avoid the folly of relying on a mere guarantee and should require the district organization to make a direct agreement to pay to the United States a lump sum covering their entire annual installment of the construction charge coming due each year from each project or division of a project, and should also require the district to collect and pay its own operation and maintenance expenses, including the operation and maintenance of the canal system, and to pay in advance to the Government the operation and maintenance cost of the reserved works.

(*d*) The responsibility for the operation and maintenance of the canals and laterals should be placed in the district, both for the reason that the Government is not well adapted to operate the ditches and laterals and deal with individual water users and also for the reason that this responsibility when placed on the water users' organization is very helpful in developing a conservative and constructive attitude on the part of the water users.

(*e*) In cases where there are large reservoirs serving a number of different projects, or large diversion works diverting water for two or more canal systems where the systems are under different management, it is usually best that the Government reserve the operation and control of such reservoirs and diversion works.

(*f*) Our experience also indicates that where power plants are involved it is usually best to handle the power plants under a similar system, the Government operating the plant but selling the power at wholesale either to municipalities which distribute it to the individual users or to companies formed for that purpose.

On several of the projects in the Northwest we are still struggling with contracts and organizations which do not meet all of the desired requisites. In such cases, even on the best projects, of which the Tieton division of the Yakima project is a good illustration, the amount of delinquent charges continues to increase from year to year, and, while a good record of payment has been made in some cases, the tendency is toward a less favorable rather than a more favorable condition both as to amount of delinquency and as to the relationship between the Government and the water users.

SUCCESS DEPENDS UPON PROJECT FEASIBILITY

While a proper form of contract with a district organization is very helpful in putting a fairly feasible project on its feet and in improving the relations between the Government and the water users, it should not be assumed that a contract containing the provisions above outlined is a panacea for all the ills of all reclamation projects. Unless the physical conditions as to soil and water supply, markets, etc., are sufficiently favorable so that crops sufficient to support the farmers and leave a surplus available to pay water charges can be produced, no form of contract can make a success of the project or secure the payment of the charges, and, regardless of the form of contract, it is also necessary that the terms of payment be within the ability of the average water user to meet. The mistake should not be made of picking out a few especially capable or especially fortunate individuals and assuming that the average irrigation farmer can meet the conditions which could be met by such exceptional individuals. Allowance must be made in each case for the peculiar local conditions which affect each of the projects and which can be determined and provided for only by means of a very careful study of the conditions applying to each case. We are still struggling with many projects on which there are many unfavorable conditions, some of which could be improved by better contracts and better organizations and some of which could not. The contracts for new projects contain a provision requiring that in the event of the sale of land at an increased price one-half of the increase in value shall be applied to the payment of water charges on the land in question.

REDUCING SPECULATION

This provision was first included in the contract with the Kittitas reclamation district and was later included in the various contracts in connection with the Owyhee project and the Vale project and in the proposed contracts for the Gooding and Black Canyon projects. This provision has caused more discussion than any other provision in the contract and has been the subject of many comments both favorable and unfavorable. In principle it is generally admitted to be correct, but as applied to specific cases it is often claimed that it is unworkable or that appraisals have been made at too low a basis and have depressed prices and loan values.

As it is one of the purposes of this provision to protect new settlers against inflated prices for raw lands, by providing that in case increased prices are paid for the land the new settler will at least have his water charges paid up for a number of years to come; some of the complaints that this provision is holding down land prices would seem to indicate that this provision and the appraisals made under it are already having some effect.

On many of the old projects prices of raw sagebrush land during boom times have been run up to as high as $100 per acre, which is in addition to the cost of the water and the expenses necessary for improvement and reclamation. As most of these sales were made on the partial-payment plan and the deferred payments bear interest, the land charges added to the water charges created a crushing burden. The arid land in itself was almost worthless and the high prices secured were due almost entirely to the prospect of securing water from works constructed with Government money furnished without interest. In this way land speculators often reaped the reward of the Government's bounty to the detriment of actual settlers and of the project.

This evil has been often observed and commented on, but it is very difficult to find a remedy.

Sheep in the Kittitas Valley, Yakima project, Washington

Irrigation in Central Otago, New Zealand

AN interesting publication has been received by Commissioner Mead through the courtesy of F. W. Furkert, engineer in chief of the public works department, Wellington, New Zealand, describing the growth and present status of irrigation development in the Province of Otago, in the southern part of the South Island.

Analogous to the irrigation history of most of our Western States, irrigation had its birth and spread from the placer-mining regions in the mountain valleys when the placer fields became exhausted. The author describes this transition period in the following paragraph:

In due course the gold boom died a natural death and the floating population attracted to central Otago by the gold lure gradually drifted away. A few miners living in hope or too old to break fresh trails remained on their claims, but finding that the amount of gold procurable would barely suffice to keep them in food and clothing, were forced to augment their scanty earnings by the growth of vegetables and such produce as they required for their own use. Realizing from bitter experience the futility of depending upon the rainfall for moisture sufficient to the needs of their crops, they utilized the water races primarily designed to facilitate the extraction of gold from the soil for the purpose of conveying water to their crops in time of drought. This, then, was the birth of irrigation in central Otago.

For many years irrigation was confined to the diversion of small streams over the adjacent lands by private operatives. The soil fertility and climatic conditions, combined with the human energies, resulted in the creation of a type and quality of agricultural output nowhere surpassed.

This process of development soon found its natural limitations in the lack of capital, and remained so restricted until during the past decade considerable progress has been made by the establishment of several fairly comprehensive Government irrigation works and numerous smaller project schemes. Considering the limited territory and the generally unfavorable topography of the region, this progress speaks well for the enterprise of these people.

HUMAN NATURE THE SAME

It is interesting to note the similarity in the human reactions to a given set of conditions. This is illustrated by the following paragraph taken from the pamphlet:

Although irrigation farming is older than any other kind of highly developed agriculture in the world, it is nevertheless a fact that the average settler in New Zealand has had no experience in its practice. Since the advent of irrigation in central Otago people of all sorts and conditions have been coming there to take up land. Most of them come with the purpose of making comfortable homes on the land and of earning a living by farming, but one finds among them many individuals who know little or nothing of farming, as well as those who lack the physical qualities necessary to cope successfully with the varying conditions of a settler's life.

It is not generally recognized that it takes as much capital and more agricultural skill to develop and bring into production an irrigated farm than is required to successfully farm in a humid district.

THE SOILS

From the general description the soils of this region are of high quality, having been built up from the softer portions of the metamorphic schists, the chemical constitution of which has imparted a happy combination of physical and chemical characteristics. Again quoting from the pamphlet, this situation is described by Mr. B. C. Aston as follows:

Mr. B. C. Aston, writing in the Journal for June last, gives it as his opinion that "the fertility of the mica-schist soils of Otago is due not to lime or potash or to the total amount of phosphoric acid they contain, but to the comparatively large amount of available phosphoric acid present, a point of great theoretical and practical importance." The fact that available phosphate is abundant in these Otago soils but deficient in most New Zealand soils, especially those of the North Island and northern parts of the South Island, suggests that some day central Otago, with its splendid summer climate and irrigation possibilities, will become one of the finest farming districts in New Zealand.

The same writer points out that this amount of available phosphoric acid would probably equal a dressing of from 8 to 16 hundredweight of phosphoric acid per acre, which would take from 2½ to 5 tons of superphosphate to supply. If the computation is correct, then the marvelous results obtained from this soil are explained.

RAINFALL

The rainfall over the South Island presents very similar characteristics to the rainfall in the North Pacific States, being rather excessive along the west coast and deficient east of the mountain ranges. The portion over which these irrigation projects extend in central Otago is generally favored with an average annual rainfall of about 15 inches, varying from 12 to 20 inches during the growing period, October to March, inclusive, with a minimum of two-thirds of an inch during the hottest month, which is February. During this month the mean shade temperature for the month is 79° F.

IRRIGATED AREA

The extent of irrigation so far developed and in course of completion as well as the additional tracts to be developed, are shown in the following summary:

	Area actually under irrigation on Jan. 30, 1924	Works under construction mostly expected to be completed during 1924	Areas investigated and considered feasible for development by gravitational water supply	Further areas estimated as probably irrigable when cheap power is available for pumping	Total
	Acres	*Acres*	*Acres*	*Acres*	*Acres*
Government	21,400	42,400	280,750	42,350	386,900
Individual	10,000				10,000
Company		5,000			5,000
Local body	4,350	3,350			7,700
Total	35,750	50,750	280,750	42,350	409,600

When one considers the restricted territory, combined with the rugged topography, the development which has taken place within the past decade is remarkable and the schemes which are proposed look ambitious. Its past success has been built on the basis of a diversified system of farming, including dairying and the raising of beef or mutton; in addition, certain favored areas are well adapted to fruit growing. These products find their principal outlet in the United Kingdom and consist, for the total of New Zealand, principally of wool, 25 per cent; meat, 25 per cent; butter and cheese, 20 per cent; and hides and skins, 9 per cent.

NEW ZEALAND A GREAT COUNTRY

Speaking of New Zealand as a whole, the importance of this Commonwealth is worthy of note. With a population of only 1,220,000, her total trade was $375,000,000 per annum during 1919–1921, giving a per capita exceeded by that of few other countries. Her imports average $180,000,000 and her exports $195,000,000. Of the imports the United States supplied 18 per cent.[1]

The first chapter of the pamphlet is a splendidly condensed narrative of human accomplishment made possible by well-directed Government aid. The remaining chapters are devoted largely to principles and practices of irrigation which are modern and equally appliable on our own projects.

[1] "Our Competitors and Market." Lahee.

Organization Activities and Project Visitors

DR. ELWOOD MEAD, Commissioner of Reclamation, returned to the Washington office about the end of May after an absence of two months and a half, during which he attended the Pan Pacific Conference in Hawaii and visited a number of the irrigation projects of the bureau.

Miss Mae A. Schnurr, secretary to the commissioner, returned to Washington the latter part of May. Miss Schnurr spent some time in the Lower Rio Grande Valley as secretary of the Commission on the Equitable Use of the Waters of the Rio Grande, later meeting Doctor Mead at Yuma and accompanying him to several projects and other points in the Northwest where water users' hearings were held. She will resume the woman's page in the July ERA.

The special advisers on the Colorado River, appointed by the Secretary of the Interior, including Governor Emerson, of Wyoming, ex-Governor Scrugham, of Nevada, Mr. Watterman, Senator-elect from Colorado, and Professor Durand, of Stanford University, met Secretary Work, Commissioner Mead, and Chief Engineer Walter at Yuma, Ariz., the latter part of April to consider the problems of the development of the Colorado River Basin.

A conference was held recently at Pullman, Wash., with Prof. George Severance relative to the investigations to be made of typical tracts selected for study of economic phases on the Columbia Basin project.

H. R. Pasewalk, formerly chief clerk on the Strawberry Valley project, has been appointed chief clerk on the Yuma project to fill the vacancy caused by the resignation of Marion J. Gorman.

A board of engineers comprising Consulting Engineer A. J. Wiley, Engineer B. W. Steele, Construction Engineer H. J. Gault, and Project Superintendent R. C. E. Weber, met recently on the Orland project to report on various construction details of the Stony Gorge Dam.

Charles S. Hoag, junior engineer on the Grand Valley project, has been transferred to the Gooding project, Idaho.

F. O. Osborn, chief appraiser for the Denver Joint Stock Land Bank, spent several days on the Uncompahgre project obtaining information with a view to making loans on the project under the amortization plan after the execution of the proposed contract providing for adjustments on the project.

G. H. Hogue, assistant engineer on the Boise project, has been transferred to the Minidoka project.

C. M. Day, mechanical engineer from the Denver office, was on the Boise project recently looking over Arrowrock valves and conducting tests of the Black Canyon pumps. He also visited the Minidoka project and inspected the work being done on the installation of the sixth unit at the power house.

C. A. De Kay, engineering draftsman on the Milk River project, has been transferred to the North Platte project.

Recent visitors on the Milk River project included J. McKittrick and C. A. Parkhill of the Spokane Branch of the Federal Land Bank; E. C. Leedy, general agricultural development agent of the Great Northern Railway; C. D. Greenfield, Leonard Ball, and P. J. Wagner, agriculturists and colonization agents of the Great Northern; and George C. Kreutzer, director of reclamation economics.

H. W. Lawler, general superintendent of construction for the Utah Construction Co., spent several days recently at Gibson Dam, Sun River project.

H. W. Byerly, general immigration agent of the Northern Pacific Railway, was a recent visitor on the Lower Yellowstone project.

John K. Rohrer, junior engineer on the North Platte project, has been transferred to the Minidoka project.

E. W. Kronquist, irrigation engineer of the Bureau of Indian Affairs, visited the Newlands project recently to look over the drainage work in progress.

The Italian aviator, Francisco de Pinedo, landed on Elephant Butte Lake, Rio Grande project, on April 4 and left on April 6.

George C. Kreutzer, director of reclamation economics, was on the Belle Fourche project recently to confer with the district board and local organizations on matters pertaining to industrial development and settlement of the project.

Federal Reclamation Laws Annotated

The legal division of the Washington office of the bureau has recently issued a revised edition of Federal Reclamation Laws Annotated. The volume embraces the enactments of Congress pertaining to reclamation from the organic act of June 17, 1902, to those of the recent session ending March 4, 1927, as well as some earlier statutes affecting irrigation operations of the Federal Government. The annotations include digests of decisions of the courts, the Comptroller General, the Attorney General, the Department of the Interior, and the Bureau of Reclamation. Copies may be obtained from the Bureau of Reclamation, Washington, D. C., at the price of $1 each for the cloth-bound volumes and 50 cents each for those bound in paper.

Discount Received for Prompt Payment

Reports received from all the projects relative to discounts received for prompt payment indicate that discounts are taken on a large percentage of the purchases. The extent of this saving to the water users is shown in the following:

Period	Purchases		Discounts realized	Per cent of purchases
	Number	Amount		
July 1, 1926, to Apr. 30, 1927	9,195	$1,265,258.22	$12,648.91	1
Prior to July 1, 1926	112,764	22,882,649.65	221,516.23	.968
Total to Apr. 30, 1927	121,959	24,147,907.87	234,165.14	.969

From the above it is seen that discounts have amounted to approximately 1 per cent of total purchases, a record of which the Bureau of Reclamation may justly be proud and undoubtedly a source of gratification to the water users.

U. S. GOVERNMENT PRINTING OFFICE: 1927

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards,** Assistant Secretary; **E. O. Patterson,** Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary; **J. H. McNeely,** Assistant to the Secretary; **W. B. Acker,** Chief Clerk

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — George C. Kreutzer, Director of Reclamation Economics — P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chahot	E. E. Chahot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	A. W. Walker		Miss E.M.Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr	H. C. Stetson	L. H. Mong	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weher	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	Adrian, Oreg	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [9]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg	H. W. Bashore	C. M. Voyen		B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	M. J. Gorman	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks [10]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [10]		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [11]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam.	Augusta, Mont	Ralph Lowry [11]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [11]	C. B. Funk		R. J. Coffey	Berkeley, Calif.

[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.
[2] Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.
[9] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.
[10] Resident engineer.
[11] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise	Boise, Idaho	R. J. Newell	
Middle Rio Grande	Alhuquerque, N. Mex	C. C. Elder	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.
Yakima project extensions	Yakima, Wash	J. L. Lytel	
Cache la Poudre	Denver, Colo	Thos. Hawthorne	Poudre Valley Water Conservation Association.
Columbia Basin Project	Lind, Wash	B. E. Hayden	
Truckee and Carson River	Reno, Nev	A. N. Burch	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.

First Cutting of Alfalfa, Rio Grande Project, New Mexico-Texas

I 27.5: 1927

NEW RECLAMATION ERA

VOL. 18 JULY, 1927 NO. 7

ONE OF THE RESERVOIR SITES ON THE PROPOSED COLUMBIA BASIN PROJECT

Clemson College Library
Government Publications

PRESIDENT COOLIDGE COMMENDS GOVERNMENT EMPLOYEES

I WANT you to know I appreciate what you have done. I am sure the people also realize and value your efforts. They are giving closer and closer attention to the operations of their Federal Government. Their interest is essential to its perpetuation. They know what has been done and what is being done in their behalf. There must be no relaxation of effort. Wiser from the lessons of the year just closing, we should the more intelligently attack the problems facing us the coming year and more scientifically appraise our needs for the year following. To do more work and better work with a smaller outlay of the taxpayers' money is the supreme test of successful administration.

—From President Coolidge's address before the Business Organization of the Government at its thirteenth regular meeting, June 10, 1927.

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 JULY, 1927 No. 7

Interesting High Lights on the Reclamation Projects

PRESIDENT Coolidge has selected for the location of the summer White House a spot only 85 miles from the Belle Fourche project, whose farmers have within easy distance the attractiveness and recreational opportunities of the Black Hills.

THE Belle Fourche irrigation district met all contract requirements by prompt payment of $50,000 in cash on May 20. This entitled the district to water service during the season, and all individuals who have paid the last assessment are eligible to begin irrigation. An associate reclamation economist was assigned to the project on May 1 to assist in the program mapped out for development along the lines of settlement and agricultural improvement.

AT Gibson Dam, Sun River project, 11,000 cubic yards of earth and loose rock and 2,000 cubic yards of solid rock were excavated from the north abutment during the month. Work was continued on the spillway tunnel and on the erection of the concrete plant. Excavation of the south abutment was nearing completion.

THE poultry and dairy industries are in a flourishing condition on the Newlands project. Approximately 100,000 turkeys will be raised this year. Six thousand dairy cows are now on the project. It is estimated that there will be 80,000 laying hens by fall.

AIRPLANE maps have been made recently of the territory along the Yakima River from Union Gap to Pomona, and along the Naches River from its junction with the Yakima River to the mouth of the Tieton River. The photographs were taken by Lieut. W. R. Taylor, of the Army Air Corps, at an elevation of about 10,000 feet, the scale being 633⅓ feet per inch. The maps will be used in the proposed adjudication of the waters of the Yakima River.

AT Stony Gorge Dam, Orland project, excavation continued and at the end of the month the screening and mixing plants were practically completed and ready to make concrete. The total amount of excavation was estimated at 14,042 cubic yards of rock and 9,240 yards of earth and loose rock.

FEES for the appraisal of lands, aggregating 1,910 acres, had been received at the end of the month by the Orland Unit Water Users' Association under the cooperative plan for advertising and selling project lands. About 1,800 acres had been appraised by the appraisal board and reports submitted to the landowners to sign the optional agreements, listing their holdings with the bureau for sale to new settlers. It is expected that at least 2,000 acres of the 3,500 acres available will be listed for appraisal.

THE organization of a cooperative livestock marketing association is being perfected on the Grand Valley project. A considerable number of hogs have been shipped to the Los Angeles market through this agency with very satisfactory returns.

THE organization of a poultry marketing association is in progress on the Grand Valley project, and it is believed that a flourishing organization can be formed. Poultry has increased greatly during the last few years, and the shipment of eggs, chickens, and turkeys has reached considerable proportions.

THE annual spring rise of the Colorado River continued throughout the month. The month's total run-off was 11 per cent above normal. Owing to cold weather on the upper watershed, discharges there were lowered 40 per cent with a resulting flat peak at Yuma the 1st of June of 74,000 second-feet.

THE Kraft Cheese Company, with headquarters in Chicago and a processing plant at Pocatello, has purchased three cheese factories on the Minidoka project. The Rupert factory is now installed at a new site about a mile south of the city.

THE Minidoka County Wool Pool sold its 1927 clip and loaded it out at Rupert on May 31. The deal involved 52,617 pounds of wool and the price received was 30½ cents a pound. The wool was contracted to Adams and Leland, of Boston.

SHIPMENTS of agricultural products from the Yuma project totaled 338 carloads valued at $65,385, making a total since the first of the year of 2,319 carloads valued at $1,237,485.

TWENTY acres of citrus fruit trees were set out on the Yuma Mesa during May, making a total of 170 acres planted up to that time this year and a grand total of 945 acres. This will practically close the planting season until after the hot summer months.

THE general optimistic attitude on the Belle Fourche project and the publicity regarding the agricultural opportunities have resulted in continued inquiries concerning the project. Two farms were sold during the month, one at $3,200 and one at $10,000.

THE sixth unit at Minidoka power house was put in operation in June.

DURING May 11 entrymen, making a total of 82 entrymen, had been awarded units and filed water-rental applications on farm units in the Tule Lake division, Klamath project. About eight applications were on file with the examining board at the close of the month.

Planning the Columbia Basin Development[1]

The greater cost of irrigation works and the larger expense involved in the development of farms are forcing reclamation authorities everywhere to give more attention to those things which will increase farm income, because it is the farmer who pays the bills

By Dr. Elwood Mead, Commissioner, Bureau of Reclamation

ALL who have watched the operations of the Columbia Basin League have a profound respect for the intelligence, persistence, patience, and tact with which it has advocated this development of the resources of the Northwest. It is entitled to, and is receiving, the sympathetic cooperation of the friends of reclamation. It has been a helpful influence in the cooperative work carried out by the State and the Bureau of Reclamation.

The Washington congressional delegation has been equally efficient. Without its persistent and effective action the appropriations for gathering information about the project and preparing plans for its development could not have been secured.

No reclamation development is simple. It includes the settlement of water rights, the solving of engineering problems, the improvement of farms, and the creation of an agricultural program. It takes in law, engineering, agriculture, and economies; and the larger the project, the more important it is that all these different factors be thoroughly thought out in advance and arrangements made by which each will contribute its share to a final successful development. This serves to explain the investigations made of this project in the past, and I hope to-day to point out the benefits which will come from continuing these investigations until satisfactory arrangements have been made for every detail of this scheme.

An interstate agreement is needed which will insure an adequate water supply for this project and provide for the largest use of the water supply of the Columbia River and its tributaries in all the States. A commission made up of representatives of the States of Montana, Idaho, Washington, and Oregon and of the Federal Government has been at work on such an arrangement. A conference held on Wednesday of this week indicates that a satisfactory agreement may be anticipated, but it also shows that to reach this, in a way that is most satisfactory to the States which furnish the water, some modification in the original storage plans will be necessary.

Too great a disturbance of the natural reservoirs, like Coeur d'Alene and Pend Oreille, would not have the approval of those who live around these bodies of water and should be avoided if alternative storages can be provided. Investigations indicate that this can be done and that the result will be less disturbance to existing conditions in Idaho and Montana and a decided increase in the reclamation development of those States as a factor in this huge program of conservation. But to know definitely what can be done, and to be able to submit reliable estimates of cost, further investigations of foundations and storage sites must be made and should be provided for at the next session of Congress.

The extensive experience of the Reclamation Bureau in carrying out engineering investigations of this character will make its cooperation a useful factor, and I believe that this can be arranged. The Bureau of Reclamation has built the highest dam in the world and is now preparing plans for another of still greater height. This accumulated experience can be made available in the determination of how the water of the upper Columbia should be conserved.

At the conference Wednesday there was a noted absence of desire on the part of any State to secure any narrow advantage, which leads to the belief that when an agreement is reached it will mean cordial cooperation and an absence of friction when actual construction begins.

Arrangements were made for a continuance of these studies. The need now is for additional facts, the collection of which will require the establishment of additional gauging stations to know what streams contribute the water supply of the Columbia and a study of reservoir foundations to know the best place to locate supplemental storages.

FINANCING THE PROJECT

If the Government builds this project it will have to do it under a plan of financing different from that employed at present. This and the Boulder Canyon project, on the Colorado, will require so large an amount of money that neither can be built out of reclamation income.

There is no difficulty in arranging for the financing of Boulder Canyon because of the fact that the largest irrigation district in the United States, already settled and wholly improved, will be the purchaser of water and will be benefited $1,000,000 a year by the removal of the silt problem alone. The project will generate more than a half million horsepower, for which there is, at present, a large and growing demand in the city of Los Angeles, insuring an immediate, long-time contract for its purchase.

The conditions here are entirely different. This project will have to depend mainly on the creation of a profitable agricultural development on an area hitherto dry farmed. It will be necessary here to show how that development is to be brought about and what results may be anticipated in order to convince Congress that the expenditure is justified. Here is an expenditure of more than one-half billion dollars, whereas the annual income to the reclamation fund has averaged only $8,500,000 for the past five years.

This income is derived mainly from sales of the public land, income from leases of oil lands, and the construction repayments made by settlers on existing projects.

Last winter the Secretary of the Interior submitted to Congress a construction program to extend over a period of 10 years. His purpose was to show the amount of money which would be required to complete works on which construction had already begun, and the time necessary if we have only the income to the fund to use. The Secretary recommended that no new works be made a charge on this fund until those under way are completed.

It happens that the State of Washington will receive a large share of the fund. That is due to the immense extent of the Yakima project, which has been under construction for nearly 20 years and which will require 10 more years to complete. The valuable natural storages on the stream will enable nearly the whole flow of the river to be used in a region of rich soil and favoring climate.

After the existing works are completed, there are a large number of favorable opportunities for the construction of new works of relatively small cost which will absorb the fund for many years to come. Great projects like Columbia Basin and the Boulder Canyon development of the Colorado must, therefore, look to appropriations from the Federal Treasury for their completion.

Nearly everyone familiar with reclamation conditions is coming to believe that

[1] This address was broadcast and delivered before an audience of about 750 people at a meeting May 20, 1927, of the Columbia Basin Irrigation League, Spokane, Wash.

the day of private development has passed; hereafter reclamation will be mainly carried out with public funds as a part of a public policy.

That is the history of other countries. India, Egypt, Australia, South Africa, Mexico, and Peru are illustration of the disappearance of private enterprise and making irrigation works a public enterprise. That being the case, means for financing the conservation of the great rivers of the arid region must be worked out and an early solution of this is desirable.

In 1924 and 1925 Congress, by the passage of the fact finders' and adjustment acts inaugurated a new era in our economic development through reclamation. These acts require that greater attention be given to the soil and its possibilities, the kind of crops and cultivation which ought to be adopted. The capital and experience of the settler are given their proper importance, and a beginning has been made in the creation of planned rural communities.

These changes were made in the belief that they would contribute to the creation of happy and prosperous homes and would speed up earning power of farms and the return of the money invested in works. Enough experience in the operation of these laws has already been gained to show this value. It has necessitated increased activity on the part of the Bureau of Reclamation in economics and settlement. The division of reclamation economics has been created and the chief engineer, Mr. Walter, and the director of reclamation economics, Mr. Kreutzer, work together, both in the preparation of plans for new projects and in the things necessary for the fuller development of the old ones.

FORMATION OF IRRIGATION DISTRICT ALONE NOT SUFFICIENT

It is the policy of the department to require the organization of an irrigation district and the execution of a contract with this district for the repayment of construction costs as a preliminary to beginning construction. These districts are organized under the laws of the different States, which vary somewhat in details, but all make the obligation to repay construction costs a first lien on the land, the payments being collected as taxes. The Reclamation Bureau is thus relieved of the task of collecting from individuals who are in arrears.

If this were done in the case of the Columbia Basin project, there would be no serious difficulty in securing a lien which would be legally superior to any private mortgages. The irrigation districts make their collections through the taxing power, and the tax lien is always superior to private mortgages and liens of all sorts.

From a practical standpoint, however, the success of the project may depend upon the total obligation which the settler is obliged to meet. If the mortgages are heavy the settler is likely to find the total burden of assessments for water charges and payments on the interest and principal of the mortgage indebtedness heavier than he can carry, and in that event the assessments for payment of the water charges are likely to become delinquent. Where the mortgages are heavy, the mortgage holder should be considered as the real owner and required to join in the same excess land contracts and recordable agreements as are required of the landowners.

Making construction costs a first lien on unimproved or badly farmed land does not insure the payment of these costs. Intensive cultivation of the soil is the only safe guaranty of solvency. The Bureau of Reclamation and the holders of millions of dollars of irrigation bonds of private projects are convinced that a district obligation has little value unless the land is settled and properly farmed.

What then must be done to insure the prompt settlement and cultivation of these lands? To answer this we must know who owns them; we must know something of the owners' views and plans. Do they intend to build houses, level land, sow alfalfa, and set out orchards, or do they intend to sell the land when the canal creates a demand?

If the same procedure is followed here as is being carried out on the Vale, Owyhee, and Payette projects, the land will be appraised and the owners will be required to agree in writing to offer their land for sale at the appraised price and on terms approved by the department.

In the light of reclamation experience it will not be sufficient to rely on a district contract which gives a lien on unsettled land. There must go with such district contract plans for settlement and farm development which the department and Congress will accept as feasible. That a district lien on unsettled land with no settlement program is not a safe basis for development is shown by what has happened in older districts where payments were so secured.

The reason for nonpayment is lack of good farmers. The reason for noncollection is that no one will buy the land when offered at tax sale. Year after year the tax debt against lands in some of the Federal districts has accumulated. Year after year the Reclamation Bureau has to keep the projects going with money from the Federal Treasury. The thrifty, successful settlers were discouraged and anxious; realizing that they could not pay all charges on their fraction of the district many of them left.

That situation will certainly arise on this larger project if adequate provision is not made for securing good farmers and for prompt development of the farms.

Under a cooperative agreement with the State, the Bureau of Reclamation is gathering statistics as to who owns this land, what use is being made of it without irrigation, mortgage indebtedness, and owners' selling prices. These will have an important relation to settlement plans.

Since coming here I have talked with those who are gathering this information. They report that the land is farmed mainly by tenants, that the owners are scattered all over the country. These renters farm from one to five or six sections. They report that their crop returns run from 8 to 15 bushels of wheat to the acre. There is no profit in this, simply a living, as the owner gets only one-fourth to one-fifth of the return from the crop. Farther west dry farming has been practically abandoned.

The owners of this land are looking to the building of an irrigation work and have fixed prices from $20 to $100 an acre. In the drier country a great deal of the land has been sold for taxes and is now owned by the counties.

In two reclamation districts the bureau has, during the present year, become a colonizing and selling agent for 10,000 acres of land on each project. The owners have agreed to sell at a price to be fixed by impartial appraisers, with 20 years in which to pay for the land; payments to be amortized, interest to be 6 per cent. It took a year to secure these agreements. It will probably require longer here.

One mortgage company put in 22 farms. Owners were scattered throughout the country. Coordinated action on any other plan would have been difficult, if not impossible.

The railroads reaching these projects are cooperating with the Government as they could not with individual owners. States and local chambers of commerce are rendering help. The bureau has issued publications giving lists of these farms, the improvements on each, the payments to be made, and advising as to the assistance which would be given. Agricultural and social conditions are carefully stated.

This experience is showing the value to settlers of having the farms partly improved. Improved farms on both these projects are being occupied and cultivated this year. It is hard, on the other hand, to sell farms wholly unimproved.

Many settlers would buy if a house was on the land, with its cost included in the purchase price, but they lack money to meet the first payment on the land, build a house, prepare the land for irrigation, and grow the first crop, and these things all have to be done to make the farm a going concern.

NEED FOR FUND TO MAKE ADVANCES TO SETTLERS

If we had money from which to make advances to settlers, equal to one-half the cost of a house after it was built, that advance money would enable the settler to level his land and then if an advance could be made on one-half of the cost of leveling the settler could use that reduced sum to make other improvements or help meet living expenses for the first year.

Experience of other countries has shown that such advances are essential to the success of reclamation. They should be made by some one in direct contact with settlers. Advances should not exceed one-half of the outlay in labor or money made by the settler on these necessary improvements. Unless some such assistance can be provided, the completion of huge projects like this one will be slow and the success of Federal reclamation uncertain.

On one project we have agreed to spend a million dollars for drainage. Much of the land is now unoccupied. The drainage will do no good unless the land is farmed. If we could, when the drains are completed, have a quarter of a million dollars to supplement the settlers' expenditures in fixing up their farms, the repayment of drainage costs would be much more rapid and certain.

At a recent reclamation conference in Honolulu the chairman of the State Rivers and Water Supply Commission of Victoria, Australia, said that the first step in their development was the purchase, by the Government, of land to be reclaimed; they sold the farms on 34 years' amortized payments, with 5 per cent interest. They required settlers to show experience, character, and the possession of $2,500 in cash or farm equipment, and to these settlers they had advanced up to $6,000 to enable them to complete the development of their farms. The Government aids settlers by the preparation of the land for irrigation; it makes advances on houses, on leveling and other permanent improvements up to 50 per cent of their cost.

In the discussion of this plan which followed, it was brought out that the Government has no misgivings about the results. It developed that in the State of Victoria the Government has not in 20 years lost anything in making these advances. Occasionally a settler fails to meet his payments, but he is promptly evicted and the Government has been able to sell these improved farms for more than enough to repay for delays and eviction expenses. The expenditures for improving farms are all being repaid. It is the feature of their policy, as stated by the chairman, which is doing much to enable settlers to meet irrigation charges.

The greater cost of irrigation works and the larger expense involved in the development of farms are forcing reclamation authorities everywhere to give more attention to those things which will increase farm income, because it is the farmer who pays the bills.

In the report of the special commission which reviewed this project in 1925, there is a recommendation that the Government buy all of the privately owned lands as a means of working out the best arrangement of farms and their more rapid and successful settlement. That is the policy in dealing with privately owned land in most other countries and it has great advantages. We are endeavoring to avert this by securing options, but it involves a considerable outlay and the exercise of much time and patience in bringing the different landowners to accept any plans adopted.

On the Kittitas project a subdivisional plan of a part of the area was worked out in which land lines are ignored. The controlling factor is the slope of the land; the farmers' roads and ditches are all fitted to the contours. Everyone who has studied this plan realizes that it is a great improvement over having farms follow the compass regardless of the slopes.

Over in the Tieton district the farmers are changing the shape of their farms by selling to neighbors areas which naturally irrigate from the neighbors' ditches, and purchasing from neighbors land which they can irrigate from theirs. This is bringing about a more effective scheme of watering and cultivation.

The agreement to become the colonizing agent for a large number of landowners at Owyhee and Vale will, of course, be followed by a study of how the best subdivision plan could be worked out regardless of private ownerships, and there is no doubt that in some cases the farms as sold will include land from the holdings from two or more owners.

The great size of the Columbia Basin project creates possibilities for the creation of an organized rural community planned to function most effectively with all its parts adjusted to each other as are the steel works at Gary, Ind., or the Ford works at Detroit.

The weakness of American agriculture to-day grows out of the fact that for the last 50 years each farmer has attempted to operate as an individual, whereas in every other industry mass production, scientific management, and the inclusion of all things needed to success have been studied and used. We must now, through the combination of skillful cultivation, the selection of crops best suited to the climate and soil, and marketing arrangements which will direct distribution to the best markets, work out plans to overcome this weakness in agriculture.

The studies being made this year on the Columbia Basin project of ownership, mortgage indebtedness, prices of land, etc., can not be completed with the present appropriation. Provision should be made for a continuance of these economic studies. The necessity for this is increased by the fact that the State of Washington last winter enacted an irrigation district law which is destined to be a very important factor in this development. I have not had time to study all of its details. What study I have given it shows that this act, like the Federal reclamation acts of 1924 and 1925, is a decided advance in the attention it gives to economic development and the things that create earning power.

It may seem to some that this detailed planning is unnecessary, that more could be left to chance. Correct judgment as to this will be helped if we visualize what this project includes.

It means the agricultural transformation of an area nearly twice the size of the State of Rhode Island; it means building over 7,000 miles of road and thousands of bridges over canals and ditches; it means finding 30,000 qualified farmers and building more than 30,000 farm houses on that many irrigated farms. If these houses cost $1,000 each, that will mean an outlay for houses alone of $30,000,000. To buy the land, provide farm equipment, set out orchards, and sow alfalfa will involve an expenditure of over half a billion dollars. It will cost over $3,000,000 a year to maintain and operate the project.

Once developed the area irrigated will be twice that now farmed in the State of Utah, including the lands farmed without irrigation, yet Utah is a great agricultural State.

If the acre crop income equals the average of the Yakima project, and it should, the yearly total will be more than $90,000,000, or more than the present crop income from all Government reclamation projects, if those irrigated under the Warren Act are excluded.

The country towns on the project will have as many houses and as many people as will live on the farms. More than 60,000 houses will, therefore, be needed.

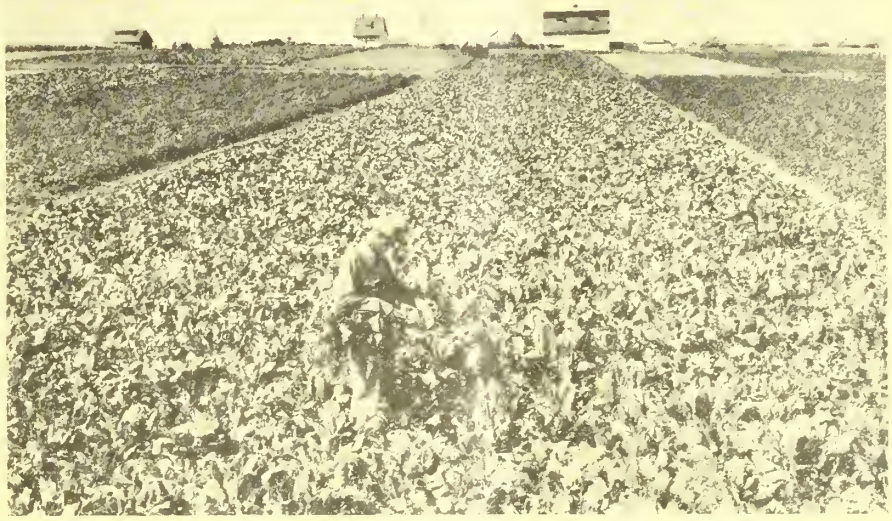
(Continued on page 101)

Settlement and Economic Notes from the Projects

Buildings and Improvements Required on Farms to Attract Settlers

During the past six months practically every farm on the Belle Fourche and Lower Yellowstone projects and the Malta division of the Milk River project having livable houses and some outbuildings have either been leased or sold. Yet other farms of equally good soil but without buildings have not attracted settlers.

Programs to secure settlers have been in effect on the Belle Fourche and Lower Yellowstone projects since the beginning of the year. This consisted of securing options on farms for sale effective until December 31, 1928. Options were secured on about 10,000 acres at Belle Fourche and 8,000 acres on the Lower Yellowstone project. The selling price of land was arrived at by independent appraisal. Terms of purchase were fixed at 10 per cent as a cash payment and the balance repayable on the amortized plan in 20 years, interest at 6 per cent. Booklets were printed describing the farms for sale, which were sent to or given to those interested in securing farms on the projects. The farms for sale on the Lower Yellowstone project were advertised by the Northern Pacific and Great Northern Railway Cos. A large number of inquiries were received.



Sugar beets on the Belle Fourche project, S. Dak.

Fifty-six settlers were secured for the Belle Fourche project, and with few exceptions they selected improved farms. Those interested in the settlement of the unoccupied farms on this project state that as many more desired to settle in this locality but were unable to find farms having suitable houses and outbuildings to shelter their families and livestock. These settlers drove over the project, looked at the farms, and went back home or settled elsewhere.

In general, they liked the country. Land prices or leasing terms were satisfactory. The permanent nature of the irrigation system and the abundant supply of cheap water appealed to them. They appreciated the fact that sugar beets, alfalfa, corn, and grain produced well at Belle Fourche and that sheep raising and dairying was profitable, but they were unable to find farms equipped with good buildings, so they could move in and devote all their time and money to growing crops and acquiring stock to consume the feed to be grown.

Late in the spring of 1927, 30 families came to Belle Fourche at one time. They were experienced beet growers. At the time of their arrival the locality was experiencing the heaviest snowstorm of the year. Houses had to be found for these families. Practically all of the substantial buildings were already occupied. These families had to take what was left or stay in town and incur the expense of boarding and lodging. The resourcefulness and patience of the local committee intrusted with the task of finding homes for these people were taxed to the utmost. One of the committee said, "Some agency simply must be found to erect houses and outbuildings on the unoccupied farms if we are to secure settlers for them."

On the Lower Yellowstone project 14 farms having a total area of 1,515 acres have been sold to 15 families. The demand by good tenants for farms on this project was four times what it has been during any of the last five years. The tenants desired to farm a year or two before purchasing. Some wanted to rent with the option of purchase. Those familiar with project conditions state that practically every livable house is occupied. The need of this project is some plan that will provide comfortable houses at modest cost and stables to shelter the livestock on all farms that are for sale or lease.

On the Malta and Chinook divisions of the Milk River project the same conditions are found. At Chinook two business men purchased 160 acres of sagebrush

Columbia Basin Project

(Continued from page 100)

To secure the approval of Congress for an undertaking of this magnitude, it must be shown, step by step, how this transformation can be made and what it will include. To attract 30,000 farmers we must show how happy and comfortable homes can be created. We must show farmers, their wives, and families that their welfare and success are the main object of all the plans.

By thinking out what is needed and providing for these needs in advance, much can be done to save time and money for the Government and for settlers. Plans of houses suited to the climate and of varying sizes and cost ought to be made. Buying at wholesale and erecting under some cooperative arrangement will save to settlers one-fourth to one-third of the cost of homes, and provide better homes in less time than if each settler is left to shift for himself. Cheap and comfortable homes will be a great factor in making wives and children contented and in lessening doctors' bills.

Here is a field of rural planning new to us and about which there is wide difference of opinion, but its relation to the feasibility of this, the largest and therefore the costliest enterprise of its kind in the world, is so direct that I have felt warranted in bringing it to your attention.

121852

land, erected two small houses and one small barn at a cost of $800, and assisted two new settlers to clear the land and get in their crops this year. The result is 25 acres of sugar beets and 130 acres of flax are growing in place of the sagebrush. This change of converting unimproved land to cultivated land has taken place in six months. The two settlers are satisfied and have agreed to each buy 80 acres and pay for the improvements and land under a contract based on crop returns.

Those giving their time and attention to securing settlers for the Malta and Chinook divisions of the Milk River project state they are in contact with a considerable number of settlers of experience and industry who are looking for improved farms which they can buy on long terms. This will permit the settler to put his money and time into growing crops. No time will be lost in making the farms profitable.

The need for these improvements is so urgent that the Commissioner of Reclamation has sent to the projects mentioned a circular and form to be sent out to all landowners who desire to sell their farms. The following is a copy of the circular and form:

United States Department of the Interior,
Bureau of Reclamation,
Washington, June 6, 1927.

To landowners of Belle Fourche, Lower Yellowstone, and Milk River projects:

During the fall of 1926 and this spring practically all uncultivated farms on the Belle Fourche, Lower Yellowstone, and Malta division of Milk River projects having houses and other suitable outbuildings were either leased or sold. What settlers especially sought were farms with houses on them to shelter their families and stables to shelter their livestock. There were more settlers seeking these developed farms than could be accomodated. At the same time farms with equally good soil but with no buildings remained untaken because it meant that the settler would either have to put his family in a tent with its discomfort and risk of sickness or incur heavy expense in boarding them in town.

It is believed that good farmers can be secured for these unimproved farms if some agency will erect suitable buildings. In some cases existing buildings can be remodeled or repaired to make them habitable. In most cases new buildings are required. These buildings ought to be financed so that their cost can be added to the selling price of the land and repaid with the cost of the farm over a long period with a low rate of interest.

The need of putting this program into effect is imperative. Sale of farms will be slow and selling expenses high unless these improvements are provided.

This improvement ought to be made before next winter in order that the railroads and the Government can advertise it in their efforts to secure settlers who will plant crops in 1928.

A blank is attached to this letter which you are requested to fill in and return to the superintendent of your project. It is hoped you can see your way clear to effect these improvements or if unable to do so yourself that you will cooperate in securing the needed money from some other source.

Very truly yours,
Elwood Mead,
Commissioner.

Department of the Interior
Bureau of Reclamation

To project superintendents:

I submit the following replies to questions concerning buildings on my farm:

1. Describe buildings on farm _____
2. If buildings are in poor condition, will you remodel or repair them for a tenant or purchaser on terms proposed in letter accompanying this form? _____
3. If there are no buildings on your farm how much will it cost to provide a small house and barn? _____
4. Will you provide buildings of about that value for a tenant or purchaser? _____
5. If you are unable at present to provide these improvements yourself, would you give a first mortgage on the farm as security if the money required can be secured from the Federal Land Bank, repayable in 20 years with interest at not to exceed 5½ per cent? _____

Remarks: _____

_____
(Name)

_____
(Address)

When the replies to these questionnaires are received the results will be published in the Reclamation Era. It is hoped that this will give information which will permit some plan to be formulated which will provide these necessary improvements.

Contracts with Landowners on Vale and Owyhee Projects

In the effort to have the land of the Vale and Owyhee projects, Oregon, disposed of to settlers on its unimproved value the landowners of these two projects are being asked to sign two classes of individual contracts. One contract, called the incremented value contract, binds the landowner signing it to divide with the project any amount for which his land may be sold in excess of the value arrived at by independent appraisal. One-half of the amount of the sale in excess of the appraised value must be turned over to the irrigation district to apply as a credit on the purchaser's irrigation charges. Any improvements on the land at the time of the appraisal are valued and added to the selling price of the land. Provision is made also that improvements which shall be effected in the future shall be appraised and likewise added to the selling price of the farm.

The other form of contract has for its object the subdivision and sale of land held in large ownerships, which in this connection means the ownership by one person or corporation of more than 160 acres. Such large landowners are by the contract obligated to select from their holdings the portion which they wish to retain (not exceeding 160 acres) and the remainder they are to dispose of at the prices stated in the contract.

When these contracts were first prepared it was believed that landowners would subdivide the land themselves and secure their own buyers. The owners of the larger tracts of land were reluctant to sign the contracts because they thought the selling costs, including advertising, would leave them very little for the land. This is generally true. If each owner is left to secure his own buyers a great deal of waste in time and money would result.

To overcome this and to provide a coordinated plan of settlement, the contracts were amended to give authority to the Secretary of the Interior to sell any of the land in question at the prices fixed. In other words, the Government could act as the settlement agency. The following article is incorporated in the contract to provide for this:

It is further agreed that the Secretary of the Interior and his successors in office shall be, and hereby are, duly authorized and empowered by power of attorney, irrevocable, to sell at the prices above specified any part of the above-described excess lands, legal and equitable title to which shall one year after the date of the notice from the Secretary of the Interior that water is ready for delivery to such land stand in the name of the landowner, and the said landowner, for itself, its successors and assigns, does by this agreement make, constitute, and appoint the Secretary of the Interior and his successors in office its lawful attorney, effective one year after the date of said notice, to sell and transfer any or all of the above-described lands to whom the Secretary of the Interior may deem best and on the terms and conditions herein defined, and at the appraised prices aforesaid, giving and granting unto the Secretary of the

Interior full power and authority to do and perform all and every act and thing whatsoever requisite and necessary to be done in the sale of said lands as fully and to all intents and purposes as the landowner may do, to effect full compliance with the terms of this agreement, this power, once becoming effective, being irrevocable.

With this article included in the contract, the two large owners of excess land on the Vale and Owyhee projects, namely, the Eastern Oregon Land Co. and the Oregon Western Colonization Co., owners of about 30,000 acres, have each agreed to sign the contract. Indications are that all the owners of excess lands will sign.

Economic Data Needed from Southern Farms

In connection with the preliminary investigation now being made of opportunities for planned group settlement in the Southern States on projects designated for study by the respective State officials of North and South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee, certain economic data are essential in order to plan to best advantage further investigations and conferences looking to a definite plan for carrying on the proposed organized community development.

The investigations thus far carried out on the seven tracts of land have sought to ascertain what were their agricultural possibilities if subdivided into farms suited to the efforts of the owners and their families and improved so as to be cultivated in accordance with plans recommended by the State agricultural experts, the settlers to be selected and organized as a community group and to have the benefit of competent and experienced leadership.

The areas submitted by the several States fall into two groups—one, farms like those offered in North and South Carolina, Georgia, and Alabama, where part of the area is not cultivated and where farming methods have tended to deplete the fertility of the soil. The other group includes Mississippi, Tennessee, and Florida, where there is now little or no agriculture and where drainage, land clearing, or other reclamation work is needed before settlement can begin. On all these areas, without some outside stimulus such as is afforded by the bureau's plans, settlement must come from a slow infiltration of people from the surrounding area, and the agriculture and farming methods would be much the same as those of the adjacent cultivated areas.

It is necessary, therefore, to show clearly the benefits which would come to these tracts through the introduction of different crops, better methods of tillage, a rural organization for teamwork in business, especially in the cooperative marketing of their products, and the influence which the example of these planned settlements will exert on the State as a whole. With this idea in mind the following census schedule has been prepared in order to obtain economic data which will give a complete picture of what now exists. This schedule will be used in obtaining the desired information concerning farms on the projects in South Carolina, Georgia, and Alabama.

UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

Data concerning farms cultivated in 1926

_____ Project.

Farm No. _____
(Locate farm by number on map.)

1. Name and address of farmer _____
2. Was farm operated by owner? _____ Tenant? _____
3. Was farmer white, Indian, or colored? _____
4. Married or single? _____
5. Number of children _____; ages _____
6. How many children assisted in farm work? _____
7. If other labor was employed, state number _____
8. Monthly wages paid for labor $_____ and total amount for year $_____
9. Total acreage of farm _____ Acreage cultivated _____
10. State why balance of acreage was not cultivated _____
11. How long has it been out of cultivation? _____
12. Acreage in each crop _____
13. Yield per acre of each crop _____
14. Price per bushel, per ton, etc., at which each crop was sold or could have been sold $_____
15. Number of horses and mules _____; cattle _____; sheep _____; hogs _____; chickens _____; turkeys _____; other fowls _____; hives of bees _____; other livestock _____
16. List the farming implements and tools, stating in each case whether in good, fair, or poor condition _____ Estimated value, $_____
17. Kind of house on farm, giving number of rooms, and present condition, whether good, fair, or poor _____ Estimated value, $_____
18. List barns and other outbuildings, stating size and present condition _____ Estimated value, $_____
19. If farm is fenced, state kind and amount of fencing and present condition _____ Estimated value, $_____
20. How is the domestic water supply obtained? _____
21. State kind and character of roads near farm _____

_____
(Signature of informant)

Date _____ 1927.

Economic Notes from Belle Fourche Project

Otto C. Batch, associate reclamation economist on the Belle Fourche project, South Dakota, makes the following report of economic progress on the project:

A movement has been started to have building sets erected on land available for settlement, but without improvements.

A local committee has been formed to handle livestock loans through the Minneapolis Agricultural Credit Corporation.

A cow census has been started with a view to the establishment of a cheese industry.

Work has begun on the Newell pickle salting station.

The Belle Fourche sugar factory is making fair headway. The force employed on construction is to be increased to assure completion by beet harvest time.

The following activities are suggested:

More extensive fall plowing.

Subdivision, wherever practicable, of the large farms into 80-acre tracts.

Purebred sires should be used exclusively and purebred breeding stock advocated in general.

Proper layout of farm ditches, both permanent as well as field laterals. Farm waste ditches should be required to conform with the contemplated drainage system.

More attention should be given to the plan of the farmstead, both from the standpoint of appearance as well as the economical use of time in handling farm chores.

The production of fruits and nuts on irrigated land has become an important part of the agriculture of the Western States.

The first cost of a reliable water supply forms a necessary part of an orchard investment, and the annual costs of maintaining a water system and applying water add to the yearly charges of operation.

Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

THIS section of the ERA did not appear in the May and June numbers due to my absence. I have just completed a field trip which brought me in contact with many of our project women. They have inquired verbally and by letter as to the absence of this section of interest to project women, which is a stimulus to greater effort in carrying on the work.

What is there to say about our project women? I could write pages and pages about my observations. Their progressiveness, thriftiness, and initiative are truly worthy of praise. They never seem to tire; there is always time to take part in some additional welfare activity or progressive movement. I never saw such interest as is evidenced in organization work. Arduous tasks have been made easy by labor-saving devices, and as a result the farm women are in a position to give time to matters of interest to the community.

It is a delight to hear you tell of your activities in and out of your homes. One group of women told me, "We read everything we can get our hands on, and all of our meetings, held to discuss home or community problems, are well attended."

The home-demonstration agents play a very important part in informing the housewife as to better methods to employ. This service is appreciated and made the most of.

Entrance to Yuma Country Club

Civic Pride

The Yuma project in Arizona and California boasts of this wonderful drive, lined on both sides with date palms bordering grapefruit orchards, which leads to a country club. The club is not far from the city of Yuma and one passes the Fly Aviation Field on the left—another boast of Yuma's assets.

At the entrance to the grounds of the club stand two giant cacti so typical of the region and so stately for the purpose. This is where Yuma plays. A very delightful clubhouse affords opportunity for diversions from the cares of everyday life. There are no strangers in this section. Everyone is a booster for the project—you are received with open arms. Their friendliness is contagious, and after you have been there only a very short time you feel thoroughly at home.

What an influence in any community such an attitude by the residents has on newcomers! And, after all, isn't it new settlers we want on the Yuma Mesa? Here is an important part for the project women. Just as you have been "sold" on the project, so can you make the settler feel when he comes to live among you.

Palm-lined highway to Yuma's Country Club

Community Goats Save Children

Milk for the baby, a real problem in rural New Mexico, is being solved by the community goat, which lives where a cow would not, and thus saves many a farm baby. To help get the milk to children most in need of it, the farm women of

Dona Ana and San Miguel Counties, under the direction of the home-demonstration agents, each procured a flock of county goats which are loaned out to farm families with sick or undernourished children.

One Sunday afternoon the agent of Dona Ana County carried two goats in her car a distance of 50 miles to families whose sick babies were much in need of milk. This method of supplying milk to farm children in a country where it is impractical and often impossible to keep cows is proving very effective and furnishes many touching incidents. One San Miguel County baby girl who was in a critically undernourished condition responded with a gain of 5 pounds in four months, and that in spite of the whooping cough.

Yakima Has Set the Pace

After urging the planting of shade trees and shrubbery on our projects, imagine my delight on visiting the Yakima project when I was informed many new trees have been set out in the city of Yakima and on the farms, and these were very much in evidence everywhere. One thoroughfare, originally laid out by the Northern Pacific Railway 40 years ago, is not only lined on either side with beautiful old trees, but in a center parking has a line of trees. These center trees touch those on either side and the arch effect over the street is truly something to be proud of. This is an example of what shade trees will do for a community.

The residents of Yakima advertise to all, by the appearance of their homes, that they are a home-loving people, and they don't care who knows it.

They have a lovely country club which they take great pride in showing to visitors. The view from the clubhouse alone is worth a trip to see. It has a wonderful setting, and if you keep in mind that nothing can survive very long without the application of water, you thoroughly appreciate the beautiful grounds, including golf links, surrounding the club.

The most impressive agricultural scene, however, on the whole trip was a panoramic view of the Yakima Valley and the surrounding country. From a vantage point the farms below formed checkerboard proportions. The water supply, the Yakima River (life's blood to the land) wound gracefully in its course; the distribution system in its miniature appearance forming small veins.

What more human picture could tell the whole story of reclamation—this veritable Paradise created out of the desert. Here is a wealth in orchards seldom seen from one point. The happy homes nestled in shade trees and the farms were adequately protected by windbreaks.

The Yakima is truly a wonderful project, and when you are thrown in personal contact with the people you come to realize why the physical advantages of this great orchard region were so completely taken advantage of and developed.

It was my privilege to meet with some of the farm women here and discuss their community and farm activities. With a tone of pride many claimed being in the pioneering class, having come to the valley before there was even a semblance of a single orchard, and only their vision to create out of the desert what is there to-day.

On the 17th of June reclamation as a Federal activity was 25 years old. Many of our present project farmers can boast of having been with us all these years, and, as a matter of fact, having been on the ground before that time waiting for the Government to take hold. I wish these pioneers would state their stories for others to read—they would be mighty interesting reading. Send them to our superintendent on your project to forward or direct to the bureau at Washington.

Saving for a Vacation

Are you going to have a vacation of some sort this year? You need a change, some fun, some rest, something new to think about, whether you happen to be a high-school student, a happy mother, or the father of a family. Everyone needs a holiday occasionally. Better work as well as better health is a result of even a brief change.

Don't say you haven't time or that you can't be spared. That ancient superstition has been long since exploded by that busiest of indispensable persons—the farmer's wife. Every summer hundreds of farm women now manage to get to mothers' camps for a complete change for a few days, returning to their families refreshed in mind and spirit, full of new ideas and happy recollections.

Don't say you can't afford a vacation. There are all sorts of vacations to be chosen—short ones, long ones, inexpensive ones, elaborate ones. It might be only a week-end trip or one over the Fourth of July or Labor Day. If you can't take a train trip, how about the family car? If you can't go to a hotel, try camping. Decide about what you could afford—if you could, put aside a little bit every week from now until midsummer. A vacation doesn't usually just happen. It has to be planned for and saved for. The sooner you begin to get ready for it, the more you will have in reserve to spend on pleasant things. Next year's fund can be started as soon as this one is over. That's the better plan, but if you haven't given the matter much thought before, do the best you can from now on.

Suppose, for example, you have your eyes on a two weeks' vacation in late August, to cost about $40—although lots of people would manage to have a fine time for a good deal less money. We'll suppose you need railroad fare as well as board money.

The next point is, of course, can you save that much? A few cents here and there—a little self-denial in small ways—perhaps going without something you would otherwise like to have—and the sum begins to grow. You have to make a choice almost daily. "Shall I have a soda, or put that much aside toward my weekly savings? Do I need new shoes, or shall I wear the old ones a little longer and be sure of my holiday?" If you are a home maker, you may be asking yourself, "Could I make some of the children's clothes and save a few dollars?" Or, "Are there ways in which I can buy the necessary supplies any cheaper?" Perhaps you could find ways to earn a bit here and there, too, to add to your funds, if you see no way to subtract anything from what you already have.

You are doing the best you can during these next few weeks. Suppose you are not able to put by as much as you had hoped before August. The only thing possible is to make your vacation plan fit what you have. You will find some pleasant way to take a vacation if you get yourself in a holiday frame of mind. Then, say to yourself, "Next year I shall be ready. I'll begin by deciding how much a really fine vacation should cost, and then save up for 50 weeks for it."

You can daydream on this practical basis for a whole year, whether you have fixed as your goal an inexpensive visit or a trip that takes you half across the continent. It isn't quite enough, however, to think only about the holiday savings. You have to think of them in relation to all your other expenditures. This means making a plan to cover everything you need, and then watching it to catch the odd pennies for the savings fund.

If you are the head of the family, you will have to include the entire family in your plans, fix on a larger sum, and get everybody to cooperate. It works out the same way as for an individual. If you have never lived by a budget, don't wait until the 1st of January to make one. You can begin any time.

Lamb Feeding Demonstration on the Uncompahgre Project, Colorado

Conducted by the extension service of the Colorado Agricultural College, under the direction of George E. Morton, head of the animal husbandry department; B. W. Fairbanks, livestock specialist; and R. H. Tucker, county extension agent

A DEMONSTRATION on lamb feeding, conducted by the extension service of the Colorado Agricultural College, began on the Uncompahgre project, Colorado, on November 23, 1926, and continued until March 10, 1927, when a "feeder's day" was held for the benefit of all project farmers, and explanatory talks were given by the men conducting the experiment, which was of vital interest to many farmers on the project interested in lamb feeding and its place in the agricultural program. A summary of the objects of the demonstration, rations fed, methods, and results obtained follows.

OBJECTS OF DEMONSTRATION

1. To demonstrate lamb fattening in the beet-growing districts of western Colorado.
2. To demonstrate the feeding value of barley and corn with alfalfa hay.
3. To demonstrate the utilization of beet tops when pastured in the field and hauled and fed in dry lot.
4. To demonstrate the feeding value of corn added to a beet-top-alfalfa-hay ration when beet tops are pastured in the field and when they are hauled and fed in dry lot.
5. To demonstrate the value of wet beet pulp added to a beet-top-alfalfa-hay ration.
6. To demonstrate the value of wet pulp added to a corn-alfalfa-hay ration.
7. To demonstrate the value of adding molasses to a corn-wet-beet-pulp-alfalfa-hay ration.
8. To demonstrate the value of the narrow-panel method of feeding.

LAMBS USED

The lambs were purchased from the Vernal section of Utah. They were typical Utah feeder lambs and were vigorous, thrifty, and in good feeder condition. These lambs were sorted into 10 pens of 50 lambs each, and all lots were uniform in weight and feeding condition when the demonstration started on November 23, 1926.

RATIONS FED

Lot 1. Corn, alfalfa hay.

Lot 2. Barley, alfalfa hay.

Lot 3. Beet tops hauled and fed in dry lot, alfalfa hay.

Lot 4. Beet tops pastured in field, alfalfa hay.

Lot 5. Beet tops pastured in field, alfalfa hay for 50 days. Corn, alfalfa to finish.

Lot 6. Corn, beet tops hauled and fed in dry lot, alfalfa hay.

Lot 7. Corn, beet tops pastured in field, alfalfa hay.

Lot 8. West beet pulp, beet tops hauled and fed in dry lot, alfalfa hay.

Lot 9. Corn, wet beet pulp, alfalfa hay.

Lot 10. Corn, wet beet pulp, molasses, alfalfa hay.

DEMONSTRATIONAL METHODS

Individual weights of the lambs were secured on three consecutive days at beginning and end of the test. Lot weights were taken every 10 days throughout the demonstration. All feed was weighed to the lambs, alfalfa hay being weighed to the individual lots. At the end of the demonstration a weigh back was made on the remaining hay. Beet tops fed have been computed on the basis of the amount yielded by 1 ton of beets. The fields used as beet-top pastures and those from which beet tops were hauled were fenced or staked and the beets produced on each area were weighed.

SUMMARY

Barley was 98 per cent as efficient as corn in the cost of putting on 100 pounds of gain at present feed prices. However, barley was only 89 per cent as efficient as corn in putting on gains; therefore, the barley lambs required a selling price of 15 cents a hundredweight greater than corn to break even.

Western Colorado lamb-feeding demonstration

[61-pound lambs; 50 lambs per lot fed 105 days (Nov. 23, 1926, to Mar. 8, 1927). Table based on one average lamb]

Lot number	1	2	3	4	5	6	7	8	9	10
Ration fed (alfalfa hay self fed in all lots)	Corn	Barley	Beet tops, hauled	Beet tops, pastured	Beet tops pasture, corn to finish	Corn, beet tops, hauled	Corn, beet tops, pastured	Wet beet pulp, beet tops, hauled	Corn, wet beet pulp	Corn, wet beet pulp, molasses
Initial weight ... pounds	60.9	60.4	61.3	61.7	61.1	61.4	61.3	60.9	60.8	61.1
Final weight ... do	91.7	87.8	82.6	83.4	86.2	95.2	95.3	84.2	92.9	93.7
Total gain ... do	30.8	27.4	21.3	21.7	25.1	33.8	34.0	23.3	32.1	32.6
Average daily gain ... do	.29	.26	.20	.21	.24	.32	.32	.22	.31	.31
Estimated shrink to market at 4 per cent ... do	3.7	3.5	3.3	3.3	3.5	3.8	3.8	3.4	3.7	3.8
Estimated gain at market ... do	27.1	23.9	18.0	18.4	21.6	30.0	30.2	19.9	28.4	28.8
Daily feed fed (pounds):										
Corn	.91				.83	.80	.82		.81	.80
Barley		.90								
Tops (from ton of beets)			.0073	.0100	.0107	.0048	.0078	.0054		
Wet pulp								3.61	3.43	2.99
Molasses										.38
Alfalfa	2.20	2.26	1.46	1.37	1.75	1.35	1.14	1.40	1.47	1.41
Feed required per 100 pounds gain:										
Corn	352.6				211.3	280.0	285.1		299.4	291.7
Barley		395.4								
Tops (from ton of beets)			4.26	5.71	2.48	1.68	2.71	2.85		
Wet pulp								1,904.8	1,268.1	1,090.1
Molasses										138.5
Alfalfa	852.4	992.9	851.7	781.8	850.7	472.5	396.4	738.7	543.5	514.1
Feed cost per 100 pounds gain	$8.73	$8.91	$4.69	$5.20	$7.49	$7.16	$7.52	$5.45	$8.07	$8.38
Initial cost of lamb ($12.73 cwt.)	$7.75	$7.69	$7.80	$7.85	$7.78	$7.82	$7.80	$7.75	$7.74	$7.78
Cost of feed	$2.37	$2.13	$0.84	$0.96	$1.62	$2.15	$2.28	$1.08	$2.29	$2.41
Interest on investment, lambs and feed, 8 per cent	$0.27	$0.26	$0.23	$0.23	$0.25	$0.27	$0.27	$0.24	$0.27	$0.27
Estimated shipping and selling expense	$0.63	$0.60	$0.56	$0.57	$0.59	$0.65	$0.65	$0.57	$0.63	$0.64
Total cost per lamb at market	$11.02	$10.68	$9.43	$9.61	$10.24	$10.89	$11.00	$9.64	$10.93	$11.10
Estimated weight at market ... pounds	88.0	84.3	79.3	80.1	82.7	91.4	91.5	80.8	89.2	89.9
Necessary selling price to break even	$12.52	$12.67	$11.89	$12.00	$12.38	$11.91	$12.02	$11.93	$12.25	$12.35

Feed costs: Corn, $35 per ton; barley, $30 per ton; beet tops, $0.50 per ton of beets; wet beet pulp, $1.90 per ton (delivered); molasses, $10 per ton; alfalfa hay, $6 per ton.

Lambs made as good gains on beet tops pastured as when the tops were hauled and fed in the lots. In pasturing, more tops and less hay were required to put on 100 pounds of gain than when the tops were hauled and fed in dry lot. In years when hay is high in price this will be an important factor in favor of pasturing the tops, but wet, stormy, fall weather will work to the disadvantage of pasturing. At present feed prices cheaper gains were put on when the tops were hauled to the lots, greater utilization of the tops was obtained, and the necessary selling price to break even was reduced 11 cents per hundredweight.

The tops from 1 ton of beets, when fed with alfalfa, equaled in feeding value 83 pounds of corn. The amount of alfalfa hay required to put on 100 pounds of gain was practically the same in both lots. Therefore, 50 cents' worth of beet tops replaced $1.45 worth of corn. However, it is doubtful whether the beet-top-alfalfa lambs will be finished enough to sell equal to the corn-alfalfa lambs.

The tops from 1 ton of beets, when fed with corn and alfalfa, replaced 108 pounds of corn and 226 pounds of alfalfa in putting on 100 pounds of gain. At present feed prices the tops from 1 ton of beets have a replacement value of $2.57. The addition of beet tops to a corn-alfalfa ration increased the gain, reduced the cost of 100 pounds of gain, and reduced the necessary selling price to break even by 61 cents per hundredweight.

Beet tops and alfalfa produced very cheap gains, but this demonstration shows the necessity of adding corn if the lambs are to be finished. The difference in selling price and resulting profits will be shown on the final report sheet, to be compiled after the lambs are marketed.

The addition of wet beet pulp to a corn-alfalfa ration proved very satisfactory, as has been the case always in previous tests with this feed. Wet beet pulp increased the rate of gain, reduced the cost of 100 pounds of gain by 66 cents, and reduced the necessary selling price to break even by 27 cents per hundredweight. Each ton of wet beet pulp fed with corn and alfalfa is equal to 84 pounds of corn and 487 pounds of alfalfa in putting on 100 pounds of gain. At present feed prices 1 ton of wet beet pulp has a replacement value of $2.93 per ton.

Tests conducted at the State experiment station proved the value of molasses added to a corn-alfalfa ration. At present feed prices its replacement value is $21.90 per ton. In this demonstration molasses was not a satisfactory addition to a full feed of corn, wet pulp, and alfalfa, as its replacement value was only $5.66 per ton. This is not an argument against feeding molasses. It merely shows that the molasses did not prove beneficial in this particular combination.

Economic Study of Minidoka Project

An economic study was made recently by John T. Montgomery and James W. Barber of the history, present situation, and outlook of agriculture on the Minidoka project, Idaho. The study was made in partial fulfillment of the requirements for the degree of master of science in agriculture in the department of agricultural economics of the University of Idaho. A review was made of the farm business of 109 representative farms, with respect both to production and to income. The farms were grouped into three classes—one designated as a general farm class, another as a livestock class, and a third as a crops class, depending on the source of the major part of the income. A summary of the study is given as follows:

1. The climate and soil of the area are such that the farmer has quite a range of enterprises to select from.

2. The present population of the project is of an adaptable type.

3. Credit facilities are ample for operating.

4. The weeds, pests, and diseases present in the area do not constitute a very great hazard, as they can practically all be readily controlled. The most outstanding exception is curly top disease of sugar beets.

5. The average size of the farms studied was 86.7 acres. The average investment per farm was $14,758, of which 82.5 per cent was in land and buildings, 7 per cent in machinery and implements, and 10.5 per cent in live stock. The average debt was 14.4 per cent of the total investment. An average of 16.6 months of family labor was available.

6. The average receipts from farm products was $6,339.20, the average expense $2,104.27, and the average margin of cash receipts over cash expense $4,234.93. Of the cash receipts 76.1 per cent was from crop sources and 23.9 per cent from livestock sources.

7. Crops are the primary sources of income on the project and livestock enterprises are supplementary.

8. The crops in the order of their estimated five-year margin of cash receipts over cash expenses per acre are potatoes, beans, sugar beets, clover seed, wheat, barley, corn, alfalfa hay, and oats. Livestock listed in the order of their net returns per animal unit are poultry, dairy cows, sheep, and swine.

9. A knowledge of the economics of the different enterprises on the Minidoka project and a knowledge of the best production practices, so that a farm organization that fits the farm and the operator's family might be built up and yields higher than the average of the project might be secured, are essential to success on the Minidoka project.

10. A surplus either in the form of livestock enterprises or cash should be built up during years of high crop prices, so that the farm can finance itself in years of low prices.

A third cutting of alfalfa on the Minidoka project, Idaho

Contracts With Irrigation Districts, Boise Project

To Pay Construction Charges On A Crop-return Basis

THE following contracts kave been executed on the Boise project with irrigation districts taking over operation and maintenance and receiving the benefits of the act of Congress of December 5, 1924 (43 Stat. 672), by which the water users on the Boise project will be enabled to pay the construction charges on a crop-return basis: Contract with the Nampa and Meridian irrigation district, dated March 2, 1926; contract with Black Canyon irrigation district, dated April 21, 1926; contract with Boise-Kuna irrigation district, dated March 20, 1926; contract with Wilder irrigation district, dated April 6, 1926; and contract with Big Bend irrigation district, dated March 25, 1926.

These contracts follow generally the same pattern, and that with the Nampa and Meridian irrigation district will be described as typical of the whole.

THE NAMPA AND MERIDIAN CONTRACT

The Nampa and Meridian irrigation district comprises within its boundaries about 40,000 acres of irrigable lands receiving their entire water supply from the irrigation works constructed by the United States, and about 24,500 acres of old water-right land, of which all but approximately 2,000 acres is irrigated from the Ridenbaugh Canal owned and operated by the district. By contract dated June 1, 1915, and amended November 15, 1918, the district had purchased from the United States water rights for the 40,000 acres of project land at an agreed price of $70 per acre, payable in 20 annual installments. In the same contracts the district had purchased supplementary stored water rights for the old water-right lands of the district. By previous contracts the district had also taken over the operation and maintenance of the part of the project system within the district.

The act of December 5, 1924, permitted the payment of construction charges on a crop-return basis; that is, the individual water user, instead of paying his proportionate part of the project-construction charges in 20 years as required by the act of Congress of August 13, 1914 (36 Stat. 686), was to be permitted to make payment of the construction charge in an indeterminate period of years, depending upon the crop returns from the land, as ascertained by the Secretary of the Interior. Each year 5 per cent of the gross crop return is payable to the United States. Subdivisions (a), (b), and (c) of article 5 of the contract are quoted in full, so as to show in detail the method fixed for the payment of the construction charges on a crop-return basis.

CONSTRUCTION PAYMENTS 5 PER CENT AVERAGE GROSS ACRE INCOME

(a) The installment of the construction charge per irrigable acre of project lands in the district payable each year shall be 5 per cent of the average gross annual acre income (as determined by the Secretary) for the 10 calendar years first preceding the year in which such installment comes due of the area of project land in cultivation in the district as found by the Secretary annually. The decision of the Secretary as to any such installments shall be conclusive.

DISTRICT LANDS AVERAGE GROSS ACRE INCOME

(b) The Secretary will determine the average gross acre income from said lands for the 10 years preceding the year 1925, and will notify the district of his findings thereon, and of the charge per irrigable acre based on 5 per cent of the said average gross acre income, and it is agreed that the annual construction installments for the project lands of the district shall be on the basis of the said rate per irrigable acre as determined by the Secretary multiplied by the number of irrigable acres as said irrigable acreage is shown on the official farm unit plats on the Boise project, until modified by notice from the Secretary of his findings in regard to average gross acre income for said project lands of the district during future years, and the district will pay each year to the United States (in addition to the payments provided for in article 11 hereof) as the construction charge on account of the said project lands of the district a sum determined by multiplying the rate per acre determined in the manner stated above by the total number of irrigable acres of project lands in the district (except lands described in article 11 hereof), which charges shall be assessed accordingly by the district to the project lands therein. Said annual payments shall continue until the full construction charge of $70 per irrigable acre of project lands in the district, plus any amounts added thereto on account of interest or penalties and any amounts added thereto under subsection L of section 4 of said act of December 5, 1924, on account of any due and unpaid construction or operation and maintenance charges added to the total obligation as provided in said subsection and other items provided for under articles 9 and 10 hereof have been fully paid by the district to the United States.

FUTURE ANNOUNCEMENTS AFFECTING CONSTRUCTION PAYMENTS

(c) After the close of each year hereafter the Secretary will notify the district in writing of his findings in regard to the average gross acre income for the project lands of the district for that year, and the average for the 10-year period including such year and the nine preceding years unless the Secretary shall find the average gross acre income for such year to be so near the average last determined as to make no material difference in the rate previously determined, in which event the rate last determined and stated by the Secretary shall continue. The failure of the Secretary to state his findings in regard to the average gross acre income for any future year will be construed as equivalent to a finding by the Secretary that the average gross acre income for such year is the same as the average of the last preceding 10 years and that the rate last stated will continue.

The contract authorizes the delinquent charges, the operation and maintenance charges for the current year, and the cost of operation and maintenance equipment transferred to the district to be added to the construction charge and paid as a part of same. Any landowner objecting to the change in terms of payment is to be permitted to remain subject to the old terms of payment.

An important part of this contract is that constituting and dealing with the board of control. It was necessary for the districts operating on the Boise project to set up some sort of machinery by which they could jointly manage certain project facilities serving more than one district. For this purpose the district contracts provide in considerable detail for a board of control comprised of representatives from the various districts.

The profits from an irrigated orchard are dependent upon a uniform distribution of water over the surface and a proper control of the soil moisture within the root zone of the trees.

International Water Group Adopts New Title

A joint resolution passed at the last session of Congress and approved March 3, 1927, increased the scope of the Commission on the Equitable Use of the Waters of the Lower Rio Grande to include the problems of the Colorado and the Tia Juana Rivers. The personnel of this commission is made up of Dr. Elwood Mead, chairman; Gen. Lansing H. Beach, of California, and W. E. Anderson, of Texas, commissioners, and M. A. Schnurr, secretary.

In view of this fact, the title "International Water Commission, United States and Mexico," has been substituted for the title heretofore used.

Reclamation Report for May, 1927

Work in progress.—The contractors at Stony Gorge Dam, Orland project, made fair progress on excavation during May, and the screening and mixing plant had been practically completed and ready for making concrete. The total amount of excavation done to the end of the month was estimated at 14,042 cubic yards of solid rock and 9,240 cubic yards of earth and loose rock. The Lynch-Cannon Engineering Co. continued work on the bridge over the American Falls Dam and made fair progress. Approximately 330 cubic yards of concrete, 64,000 pounds of reinforcing steel, and 43,000 pounds of structural steel were placed. At Gibson Dam, Sun River project, 11,000 cubic yards of earth and loose rock and 2,000 cubic yards of solid rock were excavated from the north abutment. Work on the spillway tunnel was continued with two shifts, the tunnel being driven about 65 linear feet. At Guernsey Dam, North Platte project, work on the gate and gate hoists was practically completed. All work on the concrete plugs in the diversion tunnel was also completed. At the end of the month the dam was 97.5 per cent completed on the basis of gross earnings. Work on the first division of the main canal, Kittitas division of the Yakima project, was continued by the General Construction Co. and the contract was about 54 per cent completed at the end of the month.

Weather.—Cold and stormy weather on practically all of the projects retarded planting and crop growth.

Settlement and development.—On May 11 public notice was issued opening to entry 54 public-land farm units on the Willwood division of the Shoshone project. Many inquiries concerning this opportunity are being received and it is anticipated that the units will all be entered shortly. During the month 11 additional entrymen, making a total of 82, had been awarded farm units and filed water-right applications on the Tule Lake division, Klamath project. In addition about eight applications were on file with the examining board at the close of the month. The Belle Fourche project reported that the general optimistic attitude in that section and the publicity regarding agricultural opportunities on the project had resulted in continued inquiries concerning the project and an increase in the number of sales. Two farms were sold during the month—one at $3,200 and one at $10,000.

Reclamation Bureau 25 Years Old June 17, 1927

As this issue of the New Reclamation Era *goes to press, the Bureau of Reclamation is quietly celebrating its twenty-fifth anniversary. On June 17, 1902, the reclamation act under which the bureau functions was approved by President Roosevelt. Many amendments to the original act have since been made, the later ones having to do mainly with the improvements of opportunities for success by the settlers, chief of which are the fact-finders act of December 5, 1924, and the adjustment act of May 25, 1926. Legislation has also been adopted providing for the direction of settlers in working out their agricultural programs. The next step is the adoption of legislation providing for financial aid to settlers in the early years of changing raw land into a producing farm. Such legislation must follow if the United States is to keep pace with the more advanced thought of foreign nations toward reclamation and successful agricultural development.*

Irrigation in the Madras Presidency

The importance of irrigation in south India may be seen from the fact that the value of the crops raised on irrigated land in the Madras Presidency during the year ended March 31, 1926, is estimated at about $200,000,000.

The Madras consular district may be compared with Texas as to area, and the area of the Madras Presidency—which comprises about 53 per cent of the total of the district, may be compared with the area of Montana.

In the official year ended March 31, 1926, the area of land under the chief food grains and industrial crops, both irrigated and dry, was 38,788,496 acres, an area about equal to the State of Georgia. Of this area, 7,412,879 acres, or 19.11 per cent of the total cropped area, was irrigated, the land under irrigation being comparable in area to the State of Maryland.

Potatoes and beans, Grand Valley project, Colo.

Grand Valley Potatoes Make Excellent Yield

Mrs. O. B. Garth, Loma, Colo., has very kindly sent in the accompanying illustration and writes as follows:

"Editor New Reclamation Era,
"*Washington, D. C.*

"Inclosed is a picture of the corners of a potato and bean patch. The potatoes, in bloom when taken, yielded 250 sacks to the acre in a 20-acre field belonging to J. W. Klein, Grand Valley project. This was formerly desert land and, under the irrigation project as seen here, was made to blossom as the rose.

"I would like to state we certainly enjoy the Era and are taking one of the reading courses mentioned last year."

Facts About the Strawberry Valley Reclamation Project, Utah

Here the real homeseeker is welcome and bidden to join in making this region a haven of contentment and plenty—The project described by an enthusiastic supporter of irrigated agriculture

By W. H. Olin, supervisor of agriculture, Denver & Rio Grande Western Railroad Co.

THE Strawberry Valley project lies within the fertile Utah Valley, stretching south from Provo, and skirts the shores of Utah Lake—the largest body of fresh water in all Utah. Strawberry Valley is the one Federal reclamation project lying within the Beehive State.

The water for the lands under this project are brought from the Strawberry Reservoir. This reservoir lies on the extreme west side of the Uintah Basin. It covers 8,000 acres and impounds 250,000 acre-feet of water. This water was first used for irrigation in 1915.

STRAWBERRY TUNNEL

The waters from Strawberry Reservoir are brought to the Utah Valley lands through a cement-lined tunnel 6½ by 7 feet, cut through the Wasatch Mountains. This tunnel lies 7,500 feet above sea level and is 19,000 feet long (3.6 miles). It has a capacity of 500 second-feet.

POWER DEVELOPMENT

The lands irrigated by the waters brought through the Wasatch Range by Strawberry Tunnel lie at an elevation between 4,500 and 4,800 feet. This gives a sufficient fall to generate power of considerable commercial value. Near the mouth of Spanish Fork Canyon, on the river of the same name, east of the town of Spanish Fork, is the hydroelectric power plant, which is a model of modern electrical construction. The present power developed and put to commercial use is 1,200 horsepower, with much greater development possible as needs shall be manifested. The power plant is operated by the United States and the income thus obtained helps to cut down water costs on the project. To protect the watershed, the project acquired a considerable area of land around the Strawberry Reservoir when the ground was purchased on which to store the water. The income now amounts to more than $10,000 per year for the grazing rental on the lands adjacent to the reservoir, now owned by the project.

Operation of the Strawberry Valley project passed from the Bureau of Reclamation to the water users' association on December 1, 1926. All water charges have been arranged satisfactorily, and irrigation is considered 100 per cent efficient.

LAND IRRIGATED UNDER THE PROJECT

The lands now under irrigation are divided into several primary divisions.

	Acres
(*a*) Those lands tributary to Payson as a trade center	15, 500
(*b*) Those lands tributary to Spanish Fork as a trade center	14, 200
(*c*) Those lands tributary to Mapleton and Springville as trade centers	4, 500
(*d*) Those lands reaching south through Santaquin and west and northwest toward Utah Lake	4, 000
Total acreage under Strawberry project	38, 200

This is the area of land either already in crop or for which water is available, with cement-lined laterals provided for water distribution.

SANTAQUIN DISTRICT LANDS

The writer wishes to call attention to the 4,000 acres of irrigated land not now under crop awaiting the coming of additional farmers to crop the land this next crop season, 1927. Here, in the southern end of Strawberry Valley project, a 40-acre farm is ample for the average man to farm. Here, then, in most desirable environment, is a prospective farm home for 100 families.

CLIMATIC ENVIRONMENT

Because of the altitude the maximum temperature of summer is not oppressive. The country does not have a dreary rainy season. The summers are long, averaging better than 200 days of growing weather. The evenings are always cool. The thermometer seldom reaches zero in winter and remains at that low temperature for only a few days at a time. The mountains on all sides protect Utah Valley from severe storms. Plowing is often begun in February and crops are well advanced when the early rains arrive. There are hardly any rains from June to September. Irrigation supplies the needed moisture for normal plant growth.

PROJECT SOILS

There are two general types of soils. The lower valley soils, lying below Spanish Fork, Salem, and Payson, are of a black sandy loam, extending down from 5 to 15 feet; under this is a stratum of coarse sand and gravel through which

Part of the highly cultivated land on the Strawberry Valley project, Utah

percolates pure fresh water. These lowland soils are quite fertile and retain moisture remarkably well. The higher or mesa land soils have a sandy clay loam texture with some fine gravel intermixed. On these soils are found the larger bodies of orchard fruits in Utah Valley.

CROPS GROWN

What are the crops of this project?

1. The foundation crop, for farm success, is alfalfa. Three and generally four cuttings are obtained per season, with a season's yield of 3 to 6 tons per acre.

2. Sugar beets we shall name as the second most important crop. Lorenzo Jewett, of the Santaquin section of the project, in 1925 was the champion grower of the whole Utah Valley region, averaging 24 tons per acre yield. The yield of beets runs from 10 to 20 tons, one year with another. Near-by dumps on the Orem Interurban Line and branch lines of both Union Pacific and Denver & Rio Grande Western Railroads insure a market for these beets at one of the four sugar mills within Utah Valley.

3. Early potatoes form a dependable crop, with yields ranging from 200 to 400 bushels per acre.

4. *Canning crops.*—
   - (*a*) Tomatoes, 10 to 12 tons per acre. Specially good tomato growers have made 20 tons in a single season.
   - (*b*) Peas, 2,500 to 3,000 pounds per acre.
   - (*c*) Beans, 1,500 to 2,000 pounds per acre.

Sweet corn, cucumbers, cauliflower, cabbage, and other truck crops can be produced of most excellent quality and in satisfactory tonnage per acre yields.

5. *Strawberries.*—Farmer Francom, near Payson, has proven this crop can be grown with profit and of unexcelled quality. "Francom's famous watermelons," grown by this truck farmer, are known for their excellence all over Utah. What one man can do another can at least *attempt* to do.

6. Celery is now a commercial crop on this project. It has a superior quality that is calling attention to this truck crop which has real promise. This is a crop that calls for a special truck experience, for it is our most expensive crop to grow.

7. Wheat, oats, barley, and rye are grain crops that do mighty well on the lands of the Strawberry project. Both yield and quality are surprisingly good.

8. Both bush and tree fruits are grown with commercial success on these lands. Apples, peaches, pears, plums, and sweet cherries are found in commercial orchards. Raspberries, dewberries, blackberries, gooseberries, and currants are all a commercial success in this district. Table grapes of all commercial types from Concords to Tokays can here be grown.

Salt River Project Power Development

The following is from the recent annual report of F. A. Reid, president of the Salt River Valley Water Users' Association, Salt River project, Arizona:

"The Horse Mesa development is now nearing completion and is in operation earning a substantial profit for our farms each day. The gross revenue of this new development for the month of April exceeded $80,000, or nearly $50,000 net profit above interest, depreciation, and operation and maintenance. On April 28 the power system showed 745,100 kilowatt-hours generated during the 24 hours. Previous to the starting of the Horse Mesa plant the highest day's output for April was 395,460 kilowatt-hours or but little over half the present. As you have often been heretofore advised, the Horse Mesa development when entirely completed will more than double the output of your entire system. By the end of this month the Horse Mesa development will be earning over $4,000 per day, and, with the exception of some unforseen delay or minor item, will be entirely completed and paying dividends in the form of reduced water assessments."

DAIRY, POULTRY, AND BEE INDUSTRIES

In this "land of plenty" the dairy cow, laying hen and busy bee are very much at home. The Provo district is the Jersey center of the Intermountain West. Within Utah Valley some most promising herds of Holstein and Guernsey cattle are also found. The Utah Poultry Association is one of the very best managed and most successful poultry associations in all this great Nation of ours. Everyone who sells his eggs and his poultry meats through this association automatically becomes a member of the association. Organized in 1922 it now sends to market 300 or more cars of eggs, with a net return to the grower of more than 30 cents per dozen the year round. The Utah Honey Producers' Association is likewise active in grading and marketing Utah honey in car lots at advantageous prices.

Here is a homeland known for its good schools and churches; its people, who work for present good and future prosperity; a region where community life is most ennobling and inviting; where the boy and girl club work, home demonstration and county agent workers are gradually raising country life standards; where the free rural delivery, the telephone, the radio, and hard-surfaced roads, with the auto, are eliminating distance and bringing the country and town into interdependent relationship. Truly, can we say, "Here the real home seeker is indeed welcome and bidden to join in making this region a haven of contentment and plenty."

Three-year old grapefruit orchard on Yuma Mesa

Organization Activities and Project Visitors

CHIEF Engineer Walter made a recent trip over the Colorado River drainage, visiting Glen Canyon, Boulder Canyon, Bullshead, Mohave, and Parker Reservoir sites in company with the special advisers appointed by Secretary Work to investigate the possibliities of the development of the Colorado River. Mr. Walter was in the Washington office the latter part of June to assist on the Budget.

Mary E. Walsh, formerly employed in the United States land office at Vale, Oreg., has been transferred to the Vale project as assistant clerk.

Allan Johannessen, transitman, has been transferred from the American Falls Reservoir to the Owyhee project.

L. M. Lawson, project superintendent of the Rio Grande project, New Mexico-Texas, has been appointed commissioner (American section) of the International Boundary Commission, United States and Mexico, to succeed George Curry, former Governor of New Mexico.

Mr. and Mrs. Hiram N. Savage were recent visitors to the Washington office.

General Foreman John Young, who has been in charge of the power distribution system on the Shoshone project since its inception, has resigned because of ill health and is going to southern California. Adrian Sowards, powerhouse foreman, has been placed in charge of the entire power system and Loyd H. Lasher has been appointed powerhouse foreman.

Julian Alcola Buendia and Procopio F. Eleazor, natives of the Philippine Islands, visited several of the reclamation projects and were later given temporary employment on the Kittitas division of the Yakima project.

Dr. Kanichi Kachi, of the Ministry of Agriculture and Forestry, section of land adjustment and reclamation, Tokyo, Japan, visited the Denver office to inspect plans for irrigation structures. Doctor Kachi was also a visitor at the Orland, Yuma, and Rio Grande projects, and the Washington office.

Mr. Gunjiro Takei, civil engineer, Government General of Chosen, Japan, was in the Denver office recently to study high-pressure outlet structures and valves.

William S. Arthur, for many years an employee of the Bureau of Reclamation, his last assignment being as chief clerk and superintendent of the Williston project, North Dakota, died suddenly in El Paso, Tex., on May 9 from acute peritonitis.

Assistant Engineer Peter Vier has been reinstated in the designing section of the Denver office.

William C. Matthews, special assistant to the Attorney General, spent two days recently on the Orland project in connection with the Stony Creek water right adjudication suit.

H. S. Diesem, of the Wichita Land Bank, spent several days on the Uncompahgre project, making an examination of the project and bringing up to date previous reports in connection with information desired by the bank prior to making loans on the project under the amortization plan.

L. N. McClellan, electrical engineer from the Denver office, and B. E. Stoutemeyer, district counsel, visited the Boise project recently and inspected the Black Canyon plant.

Among recent visitors to the American Falls Dam, Minidoka project, were G. E. Waesche, engineer for Sanderson & Porter, of New York, who made some investigations for a dam at that point in 1910; Gov. H. C. Baldridge, of Idaho, and John Welch, commissioner of agriculture; and Horace Addis, editor of the Idaho Farmer.

W. L. Lawson, formerly general manager of the Great Western Sugar Co., spent a day on the Sun River project to ascertain what the conditions are for sugar-beet culture.

Word has reached the Washington office of the death on June 21 of Clyde C. Dawson, former member of Secretary Work's Fact-Finding Commission.

A. N. Burch, engineer, has been appointed to take charge of Truckee and Carson River storage investigations, with headquarters at Reno.

E. B. Debler, hydrographic engineer from the Denver office; A. N. Burch, engineer; and A. W. Walker, superintendent of the Newlands project, have made a preliminary examination of the drainage problem in the Truckee Meadows and possible reservoir sites on Prosser Creek and Little Truckee.

E. E. Roddis, district counsel, was on the Lower Yellowstone project for several days in May and June in connection with rights of way and other legal matters.

C. M. Day, engineer from the Denver office, visited the Klamath project recently to conduct tests on the Dry Lake pumping plant.

Otto C. Batch has reported for duty as associate reclamation economist on the Belle Fourche project, S. Dak.

District Counsel Burke visited the Belle Fourche project recently to consider various legal matters and to meet with the irrigation district board relative to a final draft of the proposed contract.

Harold Prior, transitman, has been transferred from Gibson Dam to the project office of the Sun River project at Fairfield, and the vacancy filled by L. R. Dunkley, formerly employed on the Salt Lake Basin investigations.

Miss Viva Powers Black, underclerk at the Burley office, Minidoka project, has resigned.

Prof. G. R. McDole, soil technologist of the University of Idaho; E. N. Poulson, of the Bureau of Soils, United States Department of Agriculture; and J. A. Thompson, assistant in the soils division, Agricultural College, University of Idaho, made several visits recently to the Minidoka project in connection with a soil survey which may embrace parts of the gravity extension.

U.S. GOVERNMENT PRINTING OFFICE: 1927

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards,** Assistant Secretary; **E. O. Patterson,** Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — George C. Kreutzer, Director of Reclamation Economics — P. W. Dent, Assistant to the Commissioner

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. A. Bissell, Chief of Engineering Division

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher		E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	A. W. Walker		Miss E.M.Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr	H. C. Stetson		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	Nyssa, Oreg	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [9]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg	H. W. Bashore	C. M. Voyen		B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	H. R. Pasewalk	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks [10]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [10]		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [11]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam.	Augusta, Mont	Ralph Lowry [11]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [11]	C. B. Funk		R. J. Coffey	Berkeley, Calif.

[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.
[2] Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.
[9] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District on Dec. 31, 1926.
[10] Resident engineer.
[11] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Payette Division, Boise	Boise, Idaho	R. J. Newell	
Middle Rio Grande	Albuquerque, N. Mex	C. C. Elder	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.
Yakima project extensions	Yakima, Wash	J. L. Lytel	
Cache la Poudre	Denver, Colo	Thos. Hawthorne	Poudre Valley Water Conservation Association.
Columbia Basin Project	Lind, Wash	B. E. Hayden	
Truckee and Carson River	Reno, Nev	A. N. Burch	

The New Reclamation Era is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.

Part of the Exhibit by the Bureau of Reclamation at the Convention of the American Medical Association in Washington, D. C., May, 1927

I 27.5: 1927

NEW RECLAMATION ERA

VOL. 18 AUGUST, 1927 NO. 8

CONCONULLY RESERVOIR, OKANOGAN PROJECT, WASHINGTON

Clemson College Library
Government Publications

TEN COMMANDMENTS FOR THE IRRIGATION FARMER

1. THOROUGHLY PREPARE AND SMOOTH THE FIELD TO BE IRRIGATED.

   This will save labor, water, and time.

2. CONSTRUCT GOOD DITCHES OF THE PROPER SIZE IN THE RIGHT LOCATION.

   This will save labor and enable the field to be more thoroughly irrigated.

3. PLACE GOOD HEADGATES, CHECKGATES, AND TURNOUT BOXES WHERE AND ONLY WHERE THEY ARE PRACTICAL.

   This reduces labor and waste water during irrigation operations.

4. MAKE THE "RUNS" OF SUCH LENGTH THAT THE WATER WILL BE MOST ECONOMICALLY USED.

   "Runs" that are too long cause the water to percolate too deep. "Runs" that are too short do not allow the water to percolate deep enough. Test the depth of moisture percolation by using a soil auger.

5. KEEP ALL DITCHES AND STRUCTURES IN GOOD REPAIR.

   This saves water and labor at the time of irrigating.

6. AFTER THE WATER HAS BEEN APPLIED CULTIVATE THE FIELD.

   This will sometimes eliminate the necessity of another irrigation. Land that is not cultivated at the proper time will in time lose, by evaporation, all the moisture that has been applied by irrigating.

7. DO NOT PERMIT THE WATER TO REMAIN STANDING ON THE FIELD FOR SEVERAL HOURS IN SUCCESSION.

   It harms the crop by scalding it and damages the soil by puddling it.

8. DO NOT SOAK THE LAND TOO DEEP AT EACH IRRIGATION.

   This is a waste of time, labor, and water in most cases.

9. DO NOT WASTE WATER.

   Some one else will appreciate it. Your waste water will make a crop for some one else.

10. STUDY THE CROP—STUDY THE FIELD—STUDY THE DIFFERENT WAYS OF IRRIGATING.

    Each crop in each field is a separate problem.

PROFESSOR ALBERT S. CURRY,
Agricultural Experiment Station,
New Mexico College of Agriculture and Mechanic Arts

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 AUGUST, 1927 No. 8

Interesting High Lights on the Reclamation Projects

A MARKETING association for handling poultry products is being organized on the Grand Valley project, with an initial membership controlling 50,000 hens. The organization will include Delta and Montrose Counties.

GOOD rock has been found for foundations for practically the whole of Stony Gorge Dam, Orland project—much better than surface appearances indicated at the start. The total amount of excavation to June 30 amounted to 19,537 cubic yards of solid rock and 9,529 cubic yards of earth and loose rock.

ON the Klamath project the area planted to potatoes is estimated at 4,000 acres, or a 100 per cent increase over the 1926 acreage.

SHEEP shearing on the Klamath project has been completed. The clip for the Klamath country was the largest in years, amounting to about 900,000 pounds, practically all of which has been sold. J. Koshland Co., of Boston, purchased 400,000 pounds.

DURING the month of June, 31 entrymen, making a total of 113, had been awarded farm units and filed water-rental applications in the Tule Lake division of the Klamath project. About 10 units remained on which applications had not been filed. More than 70 per cent of the entrymen have started development of their units, and it is estimated that about 2,500 acres of these lands will be cropped or under cultivation this year.

THE Jerome B. Rice Seed Co. is conducting a small experimental plat near Fairview, Lower Yellowstone project, to determine the fitness of the locality to raise canning vegetables, such as corn, beans, tomatoes, cabbage, etc., and particularly to study the depth of planting seed, irrigation, and cultural methods.

CHECKING of the records in the office of the attorney for the Vale-Oregon irrigation district on June 30 showed that 6,450 acres had been signed up on the "incremented value" contracts and 2,000 acres on the "excess land" contracts, described in the New Reclamation Era last month.

THE Burley irrigation district, Minidoka project, has been very successful in making collections of construction and operation and maintenance charges. The first half of the 1926 construction charge was paid in full to the Government on December 31, 1926, and the second half on the due date, July 1, 1927, the total payment amounting to $95,981.78. The original assessment levied amounted to $118,378.79, of which more than $101,000 was collected, leaving a balance of about $5,000 above the amount payable to apply on next year's assessment. The 1927 maintenance assessment has been paid on 47,479 acres out of a total of 47,947 acres assessed, leaving only 468 acres not entitled to water deliveries this season.

THE annual report of the Mini-Cassia Dairymen's Association, Minidoka project, shows a marked growth in business during the year. A total of 352,568 pounds of butterfat was handled at an average price of 43 cents a pound. The association paid out during the year $151,604.24 in cream checks to the farmers for milk and cream. Expansion of business required additional quarters, which were obtained at the old Burley potato chip mill, which has been remodeled and where railroad trackage is available.

CLEAN-UP prices on last year's crop on the Yakima project have been much better since the first of the year than was expected, with the result that the returns from both apples and potatoes held in storage were practically $1,000,000 more than had been estimated.

PLANS are on foot for the establishment of a large chick hatchery at Rupert, Minidoka project. Machinery and equipment for a plant with a capacity for 47,000 eggs are reported to have been ordered.

THE State of Wyoming has begun cooperative advertising for settlers. One prospective settler visited the Riverton project during the month.

AT the recent Trans-Continental Highway Exposition at Reno, the Churchhill County exhibit, which embraces the Newlands project, received very favorable comment.

TURKEY thieves have been active on the Newlands project and it is believed that a well-organized gang with several avenues of disposition of stolen birds is at work. The loss to several growers has been considerable.

CONSIDERABLE interest is being shown by local organizations on the Milk River project in the questionnaire and circular relative to buildings on untenanted farms on the project. A thorough canvass is in progress, and it is expected that a sufficient number of farms will be offered for sale at definite terms to warrant more intensive advertising of the project, with a view to early settlement.

TOURISTS from all parts of the country are visiting the Belle Fourche project as part of a trip to the Black Hills, and inquiries are numerous concerning farming opportunities. A representative of the Chicago & North Western Railroad was on the project taking moving pictures of farm scenes as a part of their advertising program.

Economic Notes from the Projects

Fixing the Size and Shape of Farms According to Topography [1]

Subdivision and exchange of land in Badger Pocket, Kittitas Division, Yakima irrigation project, Washington

By Walker R. Young, construction engineer, Bureau of Reclamation

IN Badger Pocket, located at the easterly end of the Kittitas division of the Yakima irrigation project, Washington, there is a compact body of undeveloped land of which the Government, the State, and the Northern Pacific Railway Co., collectively, own about 50 per cent. Within the boundaries are 8,360 acres, of which approximately 6,000 acres lie under the Kittitas canals. According to recent maps, the privately owned lands are held by 24 individuals, but in some cases several tracts are controlled by one person with the result that negotiations in connection with subdivision will probably not involve more than 12 or 15 individual owners.

In general, the land is characterized by rough topography and is covered with sagebrush, so that an unusual opportunity is afforded for the application of a directed plan of settlement in which the size and shape of farms would be fixed in accordance with the topography and productive capacity of the land, keeping in mind, also, the limited capital of some of the prospective settlers.

Badger Pocket is a valley whose axis lies at about 45° with the compass. The bench lands on either side have a slope of approximately 5 feet per 100, but near the creek they are very much steeper. Over most of the area, particularly at the easterly end, side drainage has cut many channels to Badger Creek, resulting in typical "washboard" country with alternating ridges and draws transverse to the axis of the valley. If laterals and roads were constructed on legal subdivision lines, they would cross the ridges and draws, which, of course, is objectionable. It would be unusual to find a ridge or depression in coincidence with a land line as now laid out.

In subdividing an area without regard to legal subdivision lines the main laterals and roads, for obvious reasons, become the natural division lines between farms; and in an unsettled area it is possible to coordinate the layout of farms and roads to fit a lateral system designed to serve the area most efficiently. In this case there are three main laterals circling the valley.

There has been no need for building roads in Badger Pocket with the exception of a trail paralleling the creek. Advantage can therefore be taken of the opportunity to lay out a road system providing direct routes to shipping points, which, in this case, are the towns of Kittitas, on the Milwaukee Railroad, and Thrall, on the Northern Pacific.

The road system includes a trunk line down the axis of the valley, fed by secondary roads following the side depressions from all parts of the district. Roads were projected to give each farm an outlet to the trunk road, following the easiest grades and most direct practicable route to town.

The area has been divided into 120 farms ranging in size from 17 to 304 acres, the largest containing 197 acres of pasture lying above the highest lateral. Of the 120 farms 9 have less than 20 acres of irrigable land; 20 have between 20 and 30; and 22 between 30 and 40. On the north side of the valley, where the slopes are reasonably uniform, the land is considered adapted to general farming only; consequently farms were made comparatively large, the largest containing 107 irrigable acres. A number of local fruit raisers believe that as the adaptability to fruit raising is demonstrated farms gradually will be subdivided into sizes best suited for that purpose. The distribution system, therefore, has been so planned that little additional expense will be required to provide water for smaller subdivisions. As the more rugged slopes on the south side of the pocket probably will be devoted to fruit culture from the beginning, the farms in that region were made smaller.

Where boundaries between farms were not fixed by laterals or roads they were projected on ridges and in depressions in an effort to avoid the necessity of cutting through farms with laterals, which often results in leaving inaccessible patches of land.

As a result of disregarding legal subdivision lines, a large number of proposed farms include lands held at present by two or more owners. Therefore, in order to carry out the plan, it will be necessary for owners to exchange lands. One proposed farm is made up of public, State, railroad, and privately owned land. The complications attending the exchange of lands among so many owners will be annoying, but, we hope, not serious.

One complication results from the inclusion within the area of a section of school land granted to the State of Washington by the United States. Section 11 of the act of Congress, relative to the admission of Washington as a State (act of February 22, 1889, 25 Stat. 676) provides, in part: "That all lands herein granted for educational purposes shall be disposed of only at public sale and at a price not less than $10 per acre." Article 16, section 1, of the Washington State constitution states: "Nor shall any lands which the State holds by grant from the United States * * * be disposed of except in the manner and for at least the price prescribed in the grant thereof, without the consent of the United States."

In order to make exchanges of the State land possible it becomes necessary, first, to secure legislation from Congress permitting the State to dispose of its land in a manner other than by public auction and, second, to secure State legislation providing for such disposal.

During the recent session of the State legislature a bill was passed providing for the subdivision and disposal of State lands on Federal reclamation projects. The act authorizes the subdivision of State lands to conform to the division of farm units provided in the general plan; authorizes the sale of State lands in farm units as laid out; and provides for the exchange of State lands in Federal reclamation projects for public lands of the United States in the same project, or elsewhere in the State of Washington, of approximately equal appraised value, in the event such exchange is authorized by an act of Congress.

If the desired Federal legislation can be secured the problem will be simplified. If found desirable, the State's section 16 within the area selected for trial of the land-settlement plan could then be exchanged for public land either in the Kittitas project or elsewhere within the State; but it may be desirable to retain the State land within the Badger Pocket area, as it will afford an opportunity to demonstrate the practicability of State cooperation.

[1] Paper read at the Denver conference, March, 1927.

There are no problems connected with the subdivision of railroad lands for the reason that officials of the company are in sympathy with the plan and have offered to cooperate to the extent of exchanging lands.

The practicability of the plan rests largely with the individual land owners. Refusal of one owner to exchange land with his neighbor would cause the plan to be less attractive. So far, three meetings of representative owners have been held to discuss the plan and ways of overcoming the difficulties. Realizing that exchange of their lands must be worked out largely among themselves they requested that a map of the proposed subdivision be made available for their use. The reaction has been favorable, and the situation looks promising for carrying out the plan in its entirety. We have been requested to join the land owners in actually laying out and flagging a portion of the area according to the farmers' point of view. We feel confident that the result will be similar to the projected plan, but the practicability of the layout will be better illustrated if the farmers themselves have a hand in it.

Several methods of handling the exchange of lands have been discussed. The consensus of opinion seems to be that unguided transactions between individual owners would be doomed to failure. It has been suggested that all interested parties pool their lands with a trustee, who would be entrusted with their exchange and sale upon the basis of appraised values. Even though this plan might be acceptable to the United States, the State, and the railroad, it apparently does not appeal to the individual owners, as they insist on making their own deals. In the plan which at present appears to be the most practicable, the trustee would serve only as a medium through whom transactions between individuals would be consummated after they had agreed, in general, upon the terms. In transactions involving public, State, or railroad lands, the sale would be contingent upon the purchaser acquiring the portion of the farm lying on the other side of the legal subdivision line, and final action would be withheld until the purchaser actually had acquired it.

It has been claimed that departure from ordinary legal subdivisions will result in complicated land documents through the introduction of lengthy and involved descriptions of boundaries. A plan has been suggested, however, which promises to simplify transactions. Under this plan, the entire area would be platted, each farm being given a number. The plat would be filed in the county recorder's office and in all future transfers the land would be referred to as a certain tract in plat so and so. In the event the State subdivides its own land, the surveys would be made according to the adopted plan and, to avoid confusion, the tract numbers assigned would be those originally assigned by the Bureau of Reclamation.

Should the plan for Badger Pocket be adopted, an opportunity will be afforded to demonstrate the practicability of subdivision according to topography in a district which is particularly adapted to that method of subdivision. If the details can be worked out successfully, there are approximately 20,000 acres of irrigable land in the eastern end of the project susceptible to similar treatment.

Baker Project, Oregon, to Have Economic Examination by Three Special Advisers

IT has been agreed between the water users of the Baker project, Oregon, and the Secretary of the Interior that three special advisers be appointed to examine the project and make a report as to its feasibility under present conditions.

The secretary has accordingly designated George Severance, professor of agricultural economics, State College of Agriculture, Pullman, Wash.; F. B. Linfield, acting president, Montana Agricultural College, Bozeman, Mont.; and A. J. Wiley, consulting engineer of the Bureau of Reclamation, Boise, Idaho. The first meeting of the special advisers was held in Baker City, Oreg., July 14. The secretary's letter of instructions to each of the special advisers follows:

In accordance with your acceptance of an appointment as a special adviser to examine and report on the economic feasibility of the Baker project, there was sent you on July 2 the following telegram:

"Arrange to meet other members board Baker City July 14. Letter telling of arrangements for travel and compensation follows."

Your willingness to render this public service is appreciated. Arrangements will be made to enable you to make an examination and gather information needed to give an expert, unbiased opinion as to the economic feasibility of the project.

Your attention is called to the following legislative and economic conditions which have a bearing on this:

1. The cost of these works, if built, must be repaid in forty years, under the present law applicable.

2. The average construction cost will be more than $150 an acre.

3. There is at present no law, State or Federal, which provides for financial advances to settlers to aid them in improving and equipping farms.

You will seek, therefore, to ascertain what the improvement and equipment of farms on this project will cost, and to reach a conclusion as to whether sufficient settlers having the requisite capital can be secured without undue delay.

Feasibility, in the opinion of this department, depends on:

First. Whether settlers, qualified by experience and capital, can be secured;

Second. Whether in the absence of necessary capital possessed by the settlers, means for developing farms can be provided otherwise, under satisfactory conditions as to time and interest rate; and,

Third. Whether the farm, if properly equipped and improved, will enable irrigators to earn a living, meet taxes and other charges, and return the cost of these works to the Government in 40 years.

It is the view of the department that the project is not economically feasible under present conditions; that if built the cost will not be repaid to the Government in 40 years, and that it will not furnish satisfactory opportunities for settlers. The advocates of the project urge that it is feasible; that qualified settlers with adequate capital will promptly take up the land and that the cost of the works will be repaid within the contract period.

Your long experience in irrigation development in adjoining States will enable you to decide which of these two views is correct. It is the desire of this department and of Congress to act in accordance with the public interest, and to this end your report will have great value. It is proposed to submit it to Congress for its information and action.

The economic reports and the reports of hearings in Congress during the past two years are being transmitted to you through the chief engineer of the Bureau of Reclamation, who has been asked to be present at your investigations in Baker and render whatever assistance is needed to expedite your work.

Settlement and Development of Yuma Mesa

IN connection with the plans being considered for the settlement and development of the Yuma Mesa, Yuma project, Arizona-California, the following resolution has been adopted by a committee of six chosen from a mass meeting on the project called by the Yuma Chamber of Commerce:

Whereas Unit B of the Yuma Mesa auxiliary project is perhaps the best adapted body of land in our country for citrus and early grape culture, and also especially suited for the growing of early vegetables and melons, as well as all farm products; and

Whereas the United States Reclamation Service has constructed a costly, efficient, and permanent pump water system for 6,000 acres of said land; and

Whereas there are now only 900 acres of land in actual cultivation; and

Whereas the entire tract could be made highly productive and put on a profitable basis and must be brought into cultivation in order to take care of and reduce the present irrigation costs:

Now, therefore, this committee appointed by mass meeting called by the chamber of commerce and Office of United States Reclamation Service respectfully recommend that the United States Reclamation Service, the honorable Commissioner Elwood Mead, the honorable Secretary of Interior Hubert Work, and our representatives in Congress be requested to use every effort to secure an appropriation sufficient to properly clear, level, plant, and place in a state of cultivation each acre of land now owned by the Government in Unit B.

That each 10-acre unit be planted, approximately, 2 acres to citrus, 2 acres to grapes, both intercropped with alfalfa, the balance to alfalfa, or garden truck and melons, and in some cases date trees.

That same be offered for sale by the Government on an amortized plan covering a period of 20 years or more at a reasonable rate of interest.

That a syndicate or pool plan be worked out for a portion of the lands for such purchasers as do not desire to immediately live on the lands purchased, but who are willing to pay for its early development, in which case 100 to 200 acre tracts could be developed by them much cheaper than as individual units, as one expert could look after 200 acres as well as 10, and there would also be some saving in common labor; this would permit farmers, laborers, as well as salaried people and those desiring to make their future home there, to make their payments from their present income, and they would not have to move on to their tracts until the vines, trees, and crops were advanced to the stage of a paying and self-supporting basis.

We feel that the investor, as well as the actual homeseeker, should be appealed to in the sales literature, as the investors' holdings will mean actual homes in the future, and while the desired result of reclamation—that of immediate homes—is apparently delayed by selling to investors, we believe, if properly handled, the real object will be accomplished as soon, or sooner, by sales to investors as well as to actual homeseekers.

After thorough investigation, we are convinced beyond question of a doubt that alfalfa and all farm products can be grown profitably on this land—especially tomatoes, peppers, asparagus, early melons, peas, cucumbers, and onions—especially after the land has been cropped one year to alfalfa, and that as this warm, frostless belt will produce its crops so much earlier, it will find a market at many times the normal price, and that these crops have passed the experimental stage, both from the actual growing by those now cultivating the land, as well as the Government and State experiment stations.

We feel that any reclamation project is but half completed when the construction work alone is done, and that it is fully as vital to the success of the problem to see that those who pioneer the early settlement of any project should be selected with care, and finances and payments arranged in order to carry them through the earlier nonsupporting stages until the land is on a paying basis.

We also feel that the present individual owners of Mesa land not now in cultivation should be entitled to have their land also put into a state of cultivation by proper agreement with the Government.

We also feel that the railroad companies will be more than glad to cooperate in any logical advertising plan that may be suggested.

BERT CAUDRY, *Chairman.*
J. C. BARTER.
J. W. LONGSTRETH.
JOSEPH P. COREY.
J. GUY HAMILTON.
L. P. HAMILTON.

Barley crop in Yuma Valley, Yuma project, Arizona-California

Farm Laborers' Capital Reduced

On the Willwood division of the Shoshone project, Idaho, where 54 public-land farm units were opened to entry, recently, are 14 units varying in size from 9 to 9.8 acres, which were provided for homes for farm workers. The division is some distance from Powell or from other permanent source of reliable labor. It was desirable therefore that these units be taken by good farm laborers who would make their main incomes by working for others, but at the same time have a home of their own close to those farmers who employ them. The areas are sufficiently large to grow enough alfalfa to keep a cow and green feeds for chickens and pigs and provide a good garden to supply the farm workers' family with potatoes, root crops, and other vegetables.

The public notice as issued required that each applicant should have at least $2,000 in money free of liability, or the equivalent thereof in livestock, farming equipment, or other assets deemed by the examining board to be as useful to the applicant as money.

The requirement of $2,000 was, however, believed to be more than a farm laborer would need to become established, and that $500 would more nearly meet his needs. The Secretary of the Interior has accordingly amended the public notice to provide "that the applicants for farm units of 9.8 acres or less in area may qualify (if otherwise eligible) with the possession of $500 in money free of liability or other useful assets."

Oregon Has Placed 2,600 Settlers During Past Three Years

THE striking results of organized effort in obtaining settlers for unoccupied farm lands in Oregon is told in a recent letter to Commissioner Mead from W. G. Ide, manager of the Oregon State Chamber of Commerce. The work was carried on through the land settlement departments of the Portland and Oregon State Chambers of Commerce, and was financed by the state-wide Oregon development fund, especially raised for this purpose. The work received the active cooperation of the 90 affiliated chambers of commerce throughout the State, the agricultural college at Corvallis, especially through their extension service and county agents, and the officials of irrigation districts.

As a first step in the work a committee of 10 representative business men of Portland met each week to formulate plans. This committee traveled throughout the State, visiting the different chambers of commerce in localities where land settlement was necessary, assisting them to organize land settlement committees and also a separate committee known as an appraisal or approval committee, consisting of nine members—business men, farmers, bankers, and others who knew land values and who had large public interests but no interest in land sales.

This committee of nine was divided into subcommittees of three members each: A listing committee to select lands suitable for families; an approval committee to approve the prices put upon these lands by the owners; and a follow-up or welcoming committee, whose business it was to call upon the new settler, or cause some one to call on him and his family, making them feel at home, getting them acquainted in their locality, and assisting them in community affairs.

The next step was the placing of classified advertisements in selected farm papers in the Middle West, in California, and in some of the Southern States west of the Mississippi River. The result of the first year's advertising was only fair, the inquiries costing about $1 each. The second year's advertising was better, and the third year was still better, the cost being reduced from $1 per inquiry to 30 cents per inquiry.

When the inquiries were received each was answered by letter accompanied with a questionnaire designed to obtain information concerning the prospective settler's qualifications and desires in order to aid the committee in helping him to select a suitable location. At the head of the questionnaire was the following statement to the settler:

"We can come nearer to helping you get just the information you want if you will fill out the following questions and return to us. This information is confidential. We have no land to sell, but we want you to get the facts you need. If there are reasons why you prefer not to fill this out, write anyway. We advise that a part of your money be retained for expenses and equipment, and that a total capital of at least $2,500 is necessary to make a start."

Then followed space for the settler's name and address and the following questions: In which section of Oregon are you most interested? Would you prefer improved or unimproved land? How large a farm would you like? About how much would you want to invest? Would you be willing to assume some mortage? Are you farming now? Are you interested in irrigated land? Have you decided to make a trip to Oregon? About what time? What kind of farming interests you most—dairying, sheep, stock raising, poultry, fruit, general farming?

On the back of the questionnaire request was made for the names and addresses or friends of the inquirer who might be interested in the agricultural and industrial opportunities of Oregon.

Several thousand of these questionnaires were returned to the committee, which has a follow-up system extending over a period of a year. Each county in the State, where settlers are desired has been encouraged to print literature describing its own particular advantages, and each week the committee sends to the secretaries of the local chambers of commerce a list of prospective settlers who have stated in the questionnaire that they have decided to go to Oregon. This method gives every locality in the State a chance to present the opportunities they have to offer, with the result that hundreds of people have practically decided to what section of the State they would come before leaving their homes.

An additional service during the tourist season has been to place representatives at the gateways entering Oregon to interview tourists crossing the line, to learn whether they were prospective settlers and to advise them of what there is to see between the State lines and Portland.

As a result of this work the records of the committee show that 2,600 families have been located in the State, and this number is believed to be not more than half of the actual settlers who have come to the State through this work, but who have not been recorded by the committee. The new settlers have brought about $12,000,000 of new capital into the State, and it is estimated that they have increased the annual buying power of the farm population by at least $3,000,000.

Many orchard failures are directly traceable to the insufficiency of the water supply or the manner in which it is controlled and distributed.

Care and good judgment should be exercised in selecting an orchard tract. If the enterprise turns out well, the profits are high, but if it fails the losses are heavy.

Irrigated potatoes on the Shoshone project, Wyo.

Progress Report on Investigation of Reclamation and Rural Development in Seven Southern States

A MEMORANDUM submitted to the Secretary of the Interior by the Bureau of Reclamation shows the progress made on the reclamation and settlement investigations being carried on in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee in cooperation with the State officials and experts of their agricultural colleges. It outlines the progress made in carrying out investigations recommended by the special advisers appointed by Secretary Work and composed of Howard Elliott, Daniel C. Roper, and George Soule. Their report was transmitted to Congress and printed. (Doc. No. 765, pt. 1, 69th Cong., 2d sess.) This report recommended that in continuing the investigation, plans be worked out for the creation of an organized farming community of at least 100 farms in each of the above-named States, which plans would include the following features:

(*a*) Expert and experienced planning and supervision.

(*b*) Provision of money to be advanced to settlers to help complete improvement and equipment of their farms. These advances to be repaid on long terms at low rates of interest.

(*c*) Desirability of centralized responsibility and control in launching and guiding the experiment.

(*d*) Desirability and necessity for success of cooperation among the private local State and Federal Government agencies having related functions.

The tracts submitted by the States of North and South Carolina lie in the coastal plains region and are suited for general farming and truck growing. The reclamation work would consist of land clearing and extending drains.

The gross area of the North Carolina tract as tentatively selected is 6,000 acres. The tract selected in South Carolina comprises 8,015 acres. The area of the individual farm would be about 60 acres. Thirty to forty acres would be cleared, plowed, limed where necessary, and sowed to oats, rye, vetch, or other crops prior to the arrival of the settlers. The development aims to create a program so that a settler with small capital can make an adequate income for the support of his family the first year. The extension of his cultivated area could then be carried on by his individual efforts.

The tract in Georgia situated in Lee County comprises about 21,000 acres. The land has been cultivated under the prevailing tenant system. Agriculture has been unprofitable to both tenant and landlord.

The system of agriculture recommended by the State authorities is based on the "cow, hog, and hen program" and involves a farm unit of about 100 acres. The cash crops recommended are cotton, tobacco, and truck. The farm program provides for 10 acres of pecans on each farm. The only reclamation required to bring this plan into operation is some additional drains for the quick removal of surface water.

The Florida tract is located west of Fort Lauderdale in the edge of the Everglades. Its gross area is 6,500 acres. The tract is bounded on the north and south, respectively, by the constructed North New River and South New River canals; and the additional reclamation works required would consist of roads, dikes, ditches, and pumps to provide for the close water control required for lands of this type. The State of Florida has recently authorized the issuance of bonds to the amount of $20,000,000 to complete the drainage system of the Everglades and the chief engineer of Everglades district drainage is cooperating with the Bureau of Reclamation in the water-control studies as related to this tract.

The tentative agricultural plan is based on farm units of 20 acres each. The type of farming recommended is a combination of fruit, truck, livestock, and poultry.

In Alabama the area designated by the State authorities is in the "clover belt" or black prairie country about 20 miles west of Selma. It contains about 25,000 acres formerly devoted to cotton growing, which has become unprofitable since the advent of the boll weevil. The State agricultural authorities recommend dairy farming for this project. The typical farm would comprise 120 acres, 60 acres of which would be in permanent pasture and the remainder in hay and general crops. The land has practically all been in cultivation and little clearing or drainage will be required except tile drainage which may be required for certain types of soil.

The tract designated in Mississippi is near Richton on the Gulf, Mobile & Northern Railway, and comprises about 9,000 acres of cut-over pine land. It is a rolling country with good natural drainage, but the soil, being light, will require terracing on the steeper slopes.

The plan worked out here for farm operation by the State authorities contemplates a farm unit of 100 acres, 40 acres of which would be cleared, plowed, terraced, and planted to legumes in advance of the settlers' arrival. A program of general farming has been outlined, including livestock growing and crops, such as Irish and sweet potatoes, sugar cane (for sirup), cabbage, tomatoes, and turnip greens. A cannery for the latter product is in operation near the tract and has so

Stony Gorge Dam, Orland project, under construction, showing south abutment and mixing plant

far been unable to supply the demand for its output. Pecans, figs, grapes, satsuma oranges, peaches, and berries are among the opportunities for the settler who wishes to engage in fruit growing.

In Tennessee the tract selected is at an elevation of about 1,800 feet above sea level on the Cumberland plateau, adjacent to the station of Mayland on the Tennessee Central Railway. The project would include an area of 10,000 acres of rolling and somewhat broken land now covered with second growth timber of little or no commercial value. The fine sandy loam soils are susceptible of extreme crop diversification if properly fertilized. Reclamation work would consist in clearing part of the timber and in breaking, liming and seeding a portion of each tract. Some terracing may also be required.

The agricultural program outlined calls for the clearing of 50 acres of each 100 acre farm unit, and planting 20 acres of this in clovers and grasses. A type of general or mixed farming is recommended, including irish potatoes, sweet potatoes, sorghum, small fruits and the dairy cattle, sheep, pigs, and poultry essential to the self-sustaining farm here as elsewhere.

All these crop programs are tentative. More information regarding soil conditions is needed on at least three of the projects. A soil survey of the Mayland, Tenn., tract is to be made by the experts of the United States Department of Agriculture. It will determine the depth of soil and variations in character. On the Selma, Ala., tract the soils are of such a varied character that a detailed soil survey will be necessary to determine the crops suited for each farm. This will be made by the Bureau of Soils of the United States Department of Agriculture in cooperation with the State. The Florida tract lies in the edge of the Everglades with muck and sand soils intermingled and soil and agricultural studies will have to be made to determine the behavior of this soil under intense culture. The other tracts with the possible exception of North Carolina are located in counties which have been covered by the surveys of the United States Bureau of Soils.

The aim in these crop programs is to include crops for which there is a market and which if grown in the rotation worked out will maintain and increase soil fertility. They are crops which can be successfully grown by the average American.

If these colonies were established it would mean an average of 150 home-owning farmers in each colony. Statistics are now being gathered to show what is being grown on each tract and the yields and values of the different crops. This will include a census of the livestock on each farm and the character and value of improvements and implements. Part of the land is uncultivated. Information will be obtained to show why it was not cultivated and how long it has been idle. A census of the cultivators and their families will be undertaken to ascertain whether they are white or colored and whether they are owners or tenants and the kind of houses they live in.

This information will show the gain which would come to these communities through the introduction of different crops, better methods of tillage, a rural organization for teamwork in business, especially in the cooperative marketing of their products and the influence which the example of these planned settlements will exert on the State as a whole.

Following the completion of the agricultural and soil surveys as outlined, a study of the settlement problem will be taken up, to answer the question frequently asked as to where the settlers for these tracts will come from. In the course of this study it is planned to hold conferences in the different States where the representatives of the Bureau of Reclamation may meet the State authorities, representatives of the local chambers of commerce, railroad development agents large landowners and all others interested in the problem, so that plans may be worked out that will be adapted not only to general southern conditions, but modified to suit the local problems of each individual State. These conferences will probably be held in October, 1927.

George C. Kreutzer, director of reclamation economics, and C. A. Bissell, chief of the engineering division in the Washington office of the Bureau of Reclamation, left Washington on July 10, 1927, in company with S. L. Jeffords, agronomist, South Carolina State Extension Service. They will confer with the State authorities and visit the tracts in South Carolina, Georgia, and Alabama before the end of July.

Reclaiming More Land

Editorial from the Yakima Daily Republic

WE almost have no patience with the theory to which some of the farmers have become attached that more irrigation and more production necessarily must mean more competition for them, against which they rightfully should be protected. If that idea had prevailed throughout the years past there never would have been any western country at all. The Yakima Valley would have belonged to the Indians to-day and the population, aside from the aboriginals, would have consisted mainly of jack-rabbits. Our 70,000 or 80,000 people, who are enjoying a fair measure of prosperity and are making reasonable progress toward greater prosperity, would not be here.

All over this country of ours, from one ocean to the other, for 150 years we have moved along with the idea that if we could bring in more people and get them into industries of one kind and another, and build up industries, it would be a good thing for all of us then engaged in industry or business of any kind.

That theory, on which the United States of America has been built, is just as good to-day as it ever was before. If it was fundamentally false in the beginning, it is so now; and if it was sound 20 or 50 or 100 years ago, it is sound to-day.

The question of competition for the irrigation farmer who is here now really is nothing but a question whether, with the development which is possible, he should have the same number of neighbors that he has now or five times as many.

The notion that the development of our irrigation resources is merely a matter of production and sale of products is so wrong that it gives almost any thoughtful person the "willies." The Yakima Valley, under irrigation, first and above all other things is a place for homes and the rearing of children, and the building up of civic and community enterprises of all kinds. From the economic standpoint, after that it is a place where consumption will go along hand and hand with production.

There is not a farmer in the Yakima Valley who would not be better off, both as to the value of what he owns and as to the returns of what he produces, if we had here to-day—from Cle Elum to Kennewick—250,000 people instead of 100,000.

Our people should get the right slant on this matter, and they ought to stand together as one man for the further and complete development of the Yakima irrigation project, If they do not, they merely hold back and hurt themselves.

It is always better to begin dairying with a small herd of comparatively high-producing dairy cows than with a larger herd of low producers.

Reclamation Project Womena nd Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

ONE of the delightful contacts made by the writer in a recent field trip was with a young woman engaged in women's welfare work among the employees of the company she serves. Her alertness to every opportunity for betterment of conditions prompted me to ask for a short story for the ERA, and it is printed as she presented it.

Utility Girls Organized to Help All Housewives

By Alice Schuetze, general chairman, Central Power & Light Co.

One of the most noticeable events of the past few years has been the interest people have taken in the development of the resources of Texas. This wonderful State, so large in size and so rich in opportunities to those who are willing to work, is enjoying a period of development that is nothing short of startling.

To help in that development, one of the most interested and progressive utility organizations in the State, Central Power & Light Co., has recently organized its women employees into groups, meeting every month at their district headquarters for study. Each group of girls has a chairman and secretary who plan the programs that include only educational talks, demonstrations, and discussions. These educational talks on the better lighting of homes, proper refrigeration, sanitation, water supply, and kindred subjects are made often by the utility girls before women's clubs and other organizations.

The primary object of these meetings is to place the women employees of the company in a better position to serve the public. This is accomplished by educating them to understand the problems of the utility company and those of the public it serves. Thus each girl, as a representative of her company, may render assistance to the housewives of her community by bringing to them a better understanding of how their time and energy might be conserved by the introduction of modern conveniences.

One of the logical ways to make farm life less burdensome and more attractive is the introduction of modern labor-saving devices and other conveniences of city life. In bringing this fact home to the housewives the girls of the utility organization are rendering all assistance possible by demonstrations and suggestions.

In addition to the creation of a sympathetic and helpful understanding between the housewife and the utility girl, our utility girls are able to render valuable assistance in their communities by cooperation with the local Girl Scouts, girl reserves, home demonstration agents, and similar organizations. They are also qualified to teach methods of safety and resuscitation.

Many times they have presented playlets and programs to the women's church societies and other civic organizations to help them in their undertakings and at all times this assistance is given cheerfully.

Nothing can require too much time or trouble if it will help develop the community in which the company serves. One hundred and fifty girls, all members of the Central Power & Light Co.'s organization and a great many of them members of these local clubs, create a tremendous force for good in a closer and more intimate understanding of the needs of the women and the company which serves them.

They are all efficient business women, progressive and enthusiastically carrying out their everyday tasks, but never forgetting to be courteous and patient to their public and always glad to better serve them.

Will It Wash?

When a woman asks the clerk at the cotton-goods counter "Will it wash?" she usually refers to the fastness of the color. Neither she nor the clerk can be sure that the color is permanent unless a sample is washed under real laundering conditions. No one can tell by looking at a fabric whether or not it will run or fade. Even the so-called guaranty of a fast color may not mean much unless it has been given by a reliable manufacturer.

A washing test should show much more than fastness of color. It should tell whether the yarns will slip out of place when the fabric is laundered. Loosely woven materials often have this fault. Is the beauty of the fabric entirely due to the glossy finish? Will this be removed when the fabric is placed in water? Are the spots or figures put in by means of such short threads that they will pull out when the material is washed? Are they made of a paste which will be removed by washing?

These points can and should be determined by the purchaser herself. There are innumerable good fabrics available. Select a firm piece, well constructed in every detail, and your cotton dress will not only wash but wear well. If you are unfamiliar with the wide range of cotton wash materials from which to choose, visit the nearest large department store, and get a number of samples to try out at home before you make your purchase.

Facts

That the women contribute as actual farm producers is evidenced by data secured in a national survey conducted a few years ago by the Government. It was found that 26 per cent of the women helped with the livestock, 22 per cent helped with the field work on an average of nearly five weeks a year, 66 per cent took care of the gardens, 45 per cent helped with the milking, 93 per cent washed the milk pails, 76 per cent washed the separator, and 66 per cent made butter for sale, yet only 9 per cent had the butter money for their own use.

It was found that 89 per cent of the farm women took care of the poultry flocks which bring in an income to the farmers of America that is almost as great as that from the dairy business.

Simplifying Home Sewing

If you do much sewing at home for yourself or your daughters, a foundation pattern for each one will simplify the cutting and designing of simple dresses. By that is meant an individually fitted plain pattern with normal seam lines, neck, and

armholes, which may be used as a fitting guide for checking commercial patterns and as a basis for planning decorative features. Such a permanent foundation pattern is best made in a firm cotton material. Unbleached muslin, cambric, or gingham is satisfactory for the purpose. The commercial pattern that seems best suited to the individual type of figure should be followed. It must first be carefully tested before the cloth pattern is cut. Sometimes a pattern bought by bust measure does not fit any other part. It may, therefore, be advisable to find a pattern that fits the shoulder measurements and alter it to conform to the bust before cutting the dress. Measurements of the figure should always be taken and checked on the paper pattern. The length of the sleeve varies frequently, for example, and the paper pattern must be lengthened or shortened accordingly. Neck, shoulders, and other parts may need still further fitting when the guide or cloth pattern is basted together and tried on.

A large checked gingham is suggested for the foundation pattern, because the warp and filling threads of the material are most easily seen. When the pattern has been completely fitted you can mark the straight of the material in each piece of the cloth pattern for convenience in cutting by making a slash 6 to 8 inches long, exactly following a thread.

A woman can fit her own foundation pattern, but it is better to have help. After it has been fitted it may be cut down the center front and center back, and one-half used as a pattern for simple dresses, the other as a basis for designing. Almost any style of dress and many blouses can be designed from such a foundation pattern. Stitch all seam and dart lines with contrasting thread, making the pattern reversible. Also stitch all pieces one-eighth inch from the edge to prevent stretching. If the two sides are very different, save the whole pattern, marking right and left sides plainly.

Getting ready for the wool crop on the Carlsbad project, N. Mex.

Orchard trees are often set out before the land surface is graded, provided no brush or trees must be removed. This is not good practice. It is better to anticipate the planting of trees by a few years of preparation.

Some one's "home, sweet home" on an irrigation project

Contract for the Construction of the First Division of the Salt Lake Basin Project, Utah

THE act of Congress of March 3, 1925 (43 Stat. 1141), contained the following in connection with appropriations for the Bureau of Reclamation:

Salt Lake Basin project, Utah, first division: For construction of Echo Reservoir, Utah Lake control and Weber-Provo Canal, and incidental operations, $900,000: *Provided*, That any unexpended balance of any appropriation available for the Salt Lake Basin project for the fiscal year 1925 shall remain available during the fiscal year 1926: *Provided further*, That no part of this appropriation shall be used for construction purposes until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or with irrigation districts organized under State law, or water users association or associations, providing for payment by the district or districts, or water users' association or associations, as hereinafter provided: *Provided further*, That the operation and maintenance charges on account of land in this project shall be paid annually in advance not later than March 1, no charge being made for operation and maintenance for the first year after said public notice. It shall be the duty of the Secretary of the Interior to give such public notice when water is actually available for such lands.

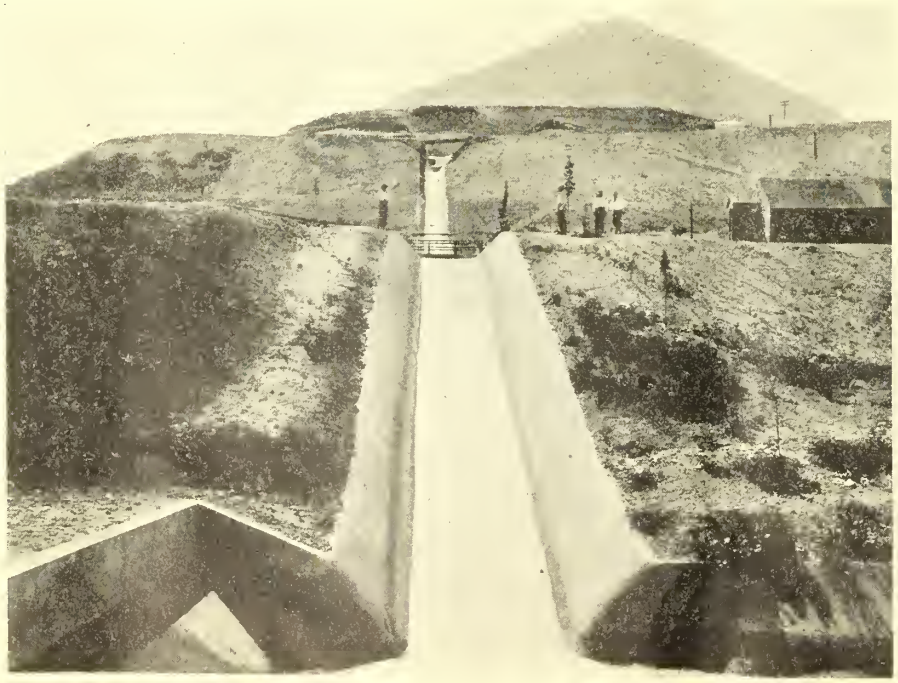
Substantially the same provisions were repeated in the appropriation act of May 10, 1926 (44 Stat. 453). The appropriation act of January 12, 1927 (44 Stat. 934) made the unexpended balance of the 1926 appropriation available for the construction of the Salt Lake Basin project during the fiscal year 1928.

The Weber River Water Users' Association was organized for the purpose of cooperating with the United States in the construction of the first division of the project, involving (*a*) the building of a storage reservoir on Weber River near Echo, in Summit County, Utah, and (*b*) the digging of a canal near Kamas, Utah, known as the Weber-Provo diversion canal, for the diversion of water from the Weber River to the Provo River. The Echo storage reservoir is to have an estimated storage capacity of 74,000 acre-feet. A large number of canal companies in the Weber and Provo River Valleys have subscribed for stock in the association, giving mortgages upon their irrigation systems to secure the payment of the assessments that will be levied to secure the construction charge payments to be due to the United States when the Echo Reservoir and Weber-Provo Canal are completed. The water users under the subscribing canals have a partial water supply at the present time, but need storage in order to supplement their natural flow water rights, so that crops requiring water late in the season may be successfully grown.

The Echo Reservoir lies lower down on the Weber River than the point of diversion of the Weber-Provo diversion canal, and the plan, so far as the irrigation of Provo River land is concerned, is to divert water for subscribers on the Provo watershed at flood times when the earlier priorities on the Weber River are receiving their full quota or at lower stages of the river when water can be released from Echo Reservoir to supply early priorities in lieu of the water diverted at the take-out of the Weber-Provo diversion canal. In the words of the contract: "The United States will furnish to the association * * * capacity in the said Weber-Provo diversion canal up to but not to exceed 210 second-feet, together with the right to divert surplus water from the natural flow of the Weber River from May 1 to August 1 of each year in such amount not exceeding 210 second-feet as is sufficient, when beneficially used for irrigation purposes through existing canals, diverting water from the Provo River above its confluence with the South Fork of the Provo River near Vivian Park at a duty not lower than 1 second-foot for 60 acres of land, to maintain the flow of the Provo River just below its confluence with the South Fork of the Provo River near Vivian Park, Utah, up to but not exceeding 510 second-feet after which said Echo Reservoir shall be filled once each and every yearly period from November 1 to the following October 31 as against the right to divert through said Weber-Provo diversion canal the difference between what is actually required to maintain said flow in the Provo River near Vivian Park, Utah, at 510 second-feet as aforesaid and said 210 second-feet and also as against the right to divert an additional 790 second-feet from the Weber River to the Provo River which may be required for developments which may be provided by the United States in the future in connection with the Salt Lake Basin project. It is expressly understood that capacity only in said Weber-Provo diversion canal is hereby disposed of by the United States, and that title to said Weber-Provo diversion canal remains in the United States, so that the United States may enlarge said canal for other possible developments which the United States may undertake in the future in connection with the Salt Lake Basin project."

The association agrees to distribute the water under the provisions of the reclamation law, and is not to furnish or deliver to any one landowner water in excess of an amount sufficient to irrigate 160 acres of land. After the Echo Reservoir and Weber-Provo diversion canal are constructed they are to be operated by the association.

The construction cost is to be paid in 20 equal annual installments, the first payable December 1, after the reservoir and canal are completed, and remaining installments on December 1 of each of the 19 years thereafter. The maximum construction expenditures under the contrate are $3,000,000.



Spillway, Strawberry Valley power house, Strawberry Valley project, Utah

McKay Dam Dedicated

McKay Dam, Umatilla project, Oreg.

THE following account of the dedication of McKay Dam is written by a participant in the celebration:

May 10, 1927, was a gala day for Oregon. Federal and State authorities, engineers, a good representative group of farmers and their families, and business men journeyed to the McKay Dam to take part in the celebration marking the release of the first storage water from the McKay Reservoir.

Dr. Elwood Mead, Commissioner of Reclamation, accompanied by Mr. William Cattanach, chairman of the State rivers and water supply commission of Victoria, Australia, Mrs. Cattanach, and others arrived in a business car of the Union Pacific. The car was set out at Pendleton and the trip to the dam, a distance of 8 miles, was made by automobile.

When the official party arrived there was a good-sized gathering. An address of welcome to the visitors, including expressions of felicitation and gratification at the completion of this monumental work, was made by Governor Patterson. He was followed by Commissioner Mead, Congressman Sinnott, and Senator Steiwer.

Mr. William Mulholland, chief engineer of the city of Los Angeles, gave a short talk. He was accompanied by his assistant, Mr. Van Norman. They made the trip specially to see this new type of dam, which has some unusual engineering features.

The dam is constructed of gravelly material of the largest volume ever used, with a heavy reenforced concrete face connecting with bedrock. It is 160 feet high and 2,600 feet long, and took a little over three years to build. The reservoir thus formed, has a capacity of 75,000 acre-feet. It was constructed by Government forces at a cost of $2,298,823, which is $200,000 less than the engineers' estimate.

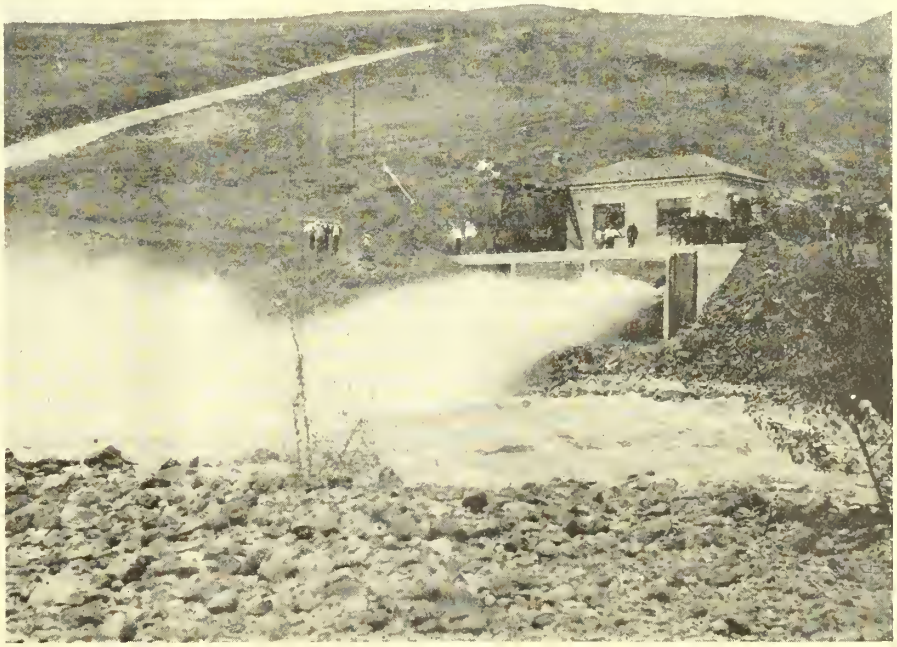
After these talks Governor Patterson and Commissioner Mead each turned a wheel operating the two needle valves which released the first storage water from the reservoir. A photograph was taken of this scene, which shows the back of the dam, with spillway to the left. It was a most impressive ceremony and one which must long linger in the memories of those who were present.

Following this the official party departed and a motor caravan formed for a trip through the territory to be benefited by the storage water in the Stanfield, Westland, and Hermiston districts.

Shoshone Water Users Will Conserve Water

The Deaver Sentinel states that the commissioners of the Deaver irrigation district, Shoshone project, Wyoming, adopted a resolution recently recommending that no small streams of irrigation water be allowed to run continuously, as it is their opinion that this practice is a very large factor in the seepage of the land. The water users of the division have been asked to cooperate with the Bureau of Reclamation in preventing waste of water. The commissioners also pointed out that the cost of operation and maintenance can be materially reduced if all water users will burn the weeds on their farm units and keep their chutes and flumes in good repair.

In Yakima Valley, Wash., the irrigation season for orchards extends from about April 15 to September 15. The number of irrigations runs from 5 to 10 and averages over 7 in the season.



Releasing the first stored water from McKay Dam, Umatilla project, Oreg.

Return Flow and Its Problems on Reclamation Projects

By E. B. Debler, Engineer, Bureau of Reclamation

WHEN water is applied to the earth's surface naturally through rains and snows or artificially by irrigation it is disposed of in a number of ways. A part passes away immediately or very soon as surface run-off or evaporation from the surface of the snow, ground, or from the exposed surfaces of plants which catch the moisture. Another part enters the ground and is in part returned to the surface by capillary action to replace water evaporated from the surface. Some is taken up through the roots of plants and evaporated in the growth processes of the plant or stored in the plant structure and hauled away as a plant product. The remainder passes beyond the limit of capillary action and joins the mass of water existing under the ground surface, there generally to form part of a moving stream seeking a lower level, and reappearing in the form of seepage, springs, or artesian flow, the particular name popularly applied being dependent on the concentration of flow and the pressure with which it reaches the surface. The reappearance of these waters may be but a few hundred feet from the source thereof, or it may be several hundred miles, depending entirely on the ground structure and topography.

In the arid regions the term "return flow" is more properly used in designating the increase therein due to the application of irrigation water. This includes waters lost by seepage from canals and reservoirs, as well as waters applied by the irrigator to his land. Such return flow is in these places particularly prominent, as the return flow from precipitation prior to irrigation development is usually so small that the stream in its passage through the region actually loses a part of the water it brings from its mountain sources, at times drying up completely. With irrigation development such conditions are materially changed and living streams often result therefrom.

The water lost by evaporation, including plant transpiration and water stored in the crops that are removed, is termed the "consumptive use" of water. It has been found generally that where sufficient water is applied to maintain the growth of plants at a near maximum rate the application of additional water results in a corresponding increase in return flow, as the consumptive use increases very little, such increase in use being due to slightly greater opportunity for evaporation. Consumptive use is not, however, uniform, as it is greatly affected by soil, crop, and climatic conditions. From the few investigations thereof, seldom sufficiently complete for well-grounded conclusions, consumptive use of water on cultivated lands is estimated to vary from 1 acre-foot per acre annually in high mountain valleys to 3 acre-feet in localities like Imperial Valley. Rice lands use much more water.

EFFECT OF IRRIGATION

The first result of the escape of unused irrigation water is to raise the underlying water table and thereby gradually increase the amount of pressure head available to force this water through the ground structures intervening between the point of application of such water and the natural stream channels which it seeks. In some localities the ground structure is so open through the existence of broken rock or coarse gravel delta formations that a very slight rise in ground water will provide all of the needed pressure head to carry away unused water, and drainage problems do not develop. In a great many localities and over large areas the ground structure is, however, such that the velocity of water flowing through it is very slow, with the result that the underground streams are incapable of carrying away the excess water applied and the water table is built up higher and higher until it reaches the top soils and affects plant growth or even reaches the surface and floods it. Artificial drainage is then necessary.

ANNUAL DISTRIBUTION AND AMOUNT

Where irrigated lands lie close to stream channels and the ground structures are open, return flow is heavily concentrated in the irrigation season, reaching a maximum shortly after irrigation diversions have reached a maximum and with winter flow but a small fraction of summer flow. With large irrigated areas underlain to great depths with permeable deposits, return flow continues throughout the year, in some instances at almost uniform rates. In this respect return flow acts just as do ordinary streams which in sandhill and lava regions often show remarkably uniform flow, whereas streams in clay, shale, or impervious rock regions will fluctuate with the precipitation. The most common condition found is one where winter return flow is from one-third to one-half of the maximum rate in late summer.

The average irrigation system delivers, at the farm, about 60 per cent of waters diverted. With ordinary irrigating methods about one-third of the delivered water escapes beyond the reach of plants. Of the diverted waters, 60 per cent becomes return flow and reenters the streams for further use unless intercepted. In extreme cases with diversions as high as 15 acre-feet per acre, return flow may reach 90 per cent of diversions and on concrete-lined systems with favorable soils may fall as low as 25 per cent.

UTILIZATION

In every case return flow augments the irrigation water available in the late summer after the stream flow, due to melting snows, has declined to less than the irrigation requirements of lands dependent thereon, and in that way serves a similar purpose as do storage reservoirs, but with the advantage over ordinary reservoirs that there is no loss from evaporation. In practice the effect has been to materially improve water rights on the lower portions of stream systems due to irrigation development on the upper reaches. In some cases the irrigation systems that have produced such return flow have been able to benefit in that less water is thereafter necessary to be passed down the stream to care for prior rights.

In many localities streams leave their mountain sources with sufficient gradient to move large masses of sand, gravel, and cobbles whenever in flood. These materials are deposited in the traversed valleys or in characteristic delta cones where the stream enters a large valley or the plains. Ordinary stream flows usually sink in these formations to reappear at some distance, under favorable conditions. The natural outflow from these underground streams and reservoirs has, in many places, been artificially increased by means of artesian wells and pumping, often to the point of excessive depletion as evidenced by permanent lowering of the water table. In places it has been found possible to materially increase the yield of such underground streams and reservoirs by facilitating increased stream losses during floods by spreading the flood water over the heads of the valleys and deltas.

RETURN FLOW ON FEDERAL PROJECTS

On the Boise project, Idaho, the Notus division is entirely supplied by drainage waters from another portion of the project and is therefore entirely dependent on return flow, the division having no canal connection with natural streams. The return flow in this case takes the place of storage which is supplied to other project lands from the Arrowrock and Deer Flat Reservoirs.

On the North Platte River in Wyoming and Nebraska, early irrigation and power development established rights to an amount of water materially exceeding the ordinary steam flow of the river in late summer. With the progress of irrigation under the canals of the North Platte government project, return flow has developed to such an extent that much less water must be by-passed at the Whalen Dam than formerly anticipated, with water supply for prior rights below the project limits much improved over conditions existing in earlier years. Return flow from lands under Government canals is supplied to a number of canals under Warren Act contracts in the vicinity of Scottsbluff and Bridgeport, Nebr., as part of a supplemental supply, in lieu of Pathfinder Reservoir storage water. Where the North Platte River, prior to the time of irrigation development, seldom discharged more than 500 or 600 second-feet during the winter at Bridgeport, the river now carries a stream of 1,600 to 2,000 second-feet throughout the winter, even though the natural flow of the river at Pathfinder Reservoir is entirely cut off.

On the Umatilla project in Oregon, the lands under the west extension division are almost entirely dependent on return flow from the Hermiston division and some smaller areas adjacent to Umatilla River in the immediate vicinity, with a large increase in this supply anticipated when the McKay Reservoir water is put to use on the lands south and west of Hermiston.

By an appropriate stipulation in the adjudication decree of Snake River, the Minidoka project in Idaho is credited with the net gain in Snake River from Neeley to Milner Dam, such gain being due to return flow from the project and amounting during the irrigation season to several hundred second-feet over and above reservoir evaporation losses through Lake Walcott. As the Minidoka project is underlain with lava formations of unknown depth and very open, a large part of its return flow returns to Snake River beyond Milner Dam and is not available for irrigation use.

On the Rio Grande project, New Mexico-Texas, the Hudspeth County water improvement district in Texas, comprising some 20,000 acres of high-class agricultural land, is entirely dependent on return flow and waste water from project lands, and largely so from the El Paso Valley lands in Texas alone, as the El Paso Valley in turn uses return flow from Mesilla Valley in New Mexico and Texas.

QUALITY OF RETURN FLOW

Precipitation reaches the earth in a comparatively pure state, but upon contact with or passage through the ground, products of mineral and organic decomposition are dissolved. It is only the inorganic or mineral salts that are of interest in this discussion. With ample precipitation, liberated soluble mineral salts are removed almost as fast as they become available without concentration in stream flows. In the arid regions, however, precipitation is usually insufficient to prevent highly mineralized soils and their effluent is often heavily charged with salts. The streams leave their mountain sources with notably pure water, which increases in mineral content in passing through the arid regions, due to influx of more highly charged water and concentration by evaporation of the stream itself. Upon applying such waters for irrigation, a negligible part of the salts carried to the lands are stored in the plants and removed. The water evaporated by the plants and soil leaves its salts and if these salts are of deleterious character they must be added to the salt content of the water passing away as return flow if irrigation is to continue indefinitely. The return flow in its slow percolation through the soil strata has further opportunity to become heavily charged with salts. In some cases the dissolved salts combine chemically with others found in place on the land to form insoluble precipitates that may be either beneficial or harmful. The suitability of return-flow water for irrigation purposes as indicated by the tolerance limit of crops, depends on the character and concentration of the dissolved salts in such water and in the soils on which it is to be used, the permeability of the soils and subsoil, provisions for drainage, crops to be grown, amount of water available for flushing purposes, and rainfall.

LEGAL STATUS

As stated, early irrigation development was largely confined to lands contiguous to streams from which they were served by short canal systems. The underlying soils were usually loose stream-washed materials which facilitated the quick return of unused waters to the stream without producing surface streams of material volume. Later developments of large areas, often at great distances from the source of water supply, resulted in many hitherto dry channels becoming living streams capable of supporting irrigation on material land areas. Artificial drainage to relieve alkali and seepage conditions also contributes large amounts of water. Increasing values of irrigation water and the exhaustion of water supply obtainable at moderate costs often furnished the incentive for recapture of return flow, including drainage waters, by the project producing it, and almost invariably resulted in litigation as other irrigators already using these waters were deprived thereof, although usually having made no expenditure to produce the water supply used by them. State irrigation laws having generally been framed before return flow became a recognized factor in irrigation supply are, on the whole, in a rather unsatisfactory shape. The decisions regarding return flow are therefore in conflict. The general tendency, however, is to regard return flow in all of its forms recoverable by the agent producing it until it enters a stream which in its natural condition supplied irrigation diversions, when it becomes a part of such stream and subject to appropriation therefrom as are other waters of the same stream. The result is a material aid to new projects which can be arranged to utilize their return flow by sale to other projects needing such supplemental supply or by project extension. At the same time such decisions do not strike at vested rights which have been built up from the use of return flow under earlier development when such return flow was rarely sufficiently concentrated in volume to become a bone of contention.

NEW PROJECTS

On new projects the consideration of the return flow becomes a very important factor. If materially impeded by flat topography or impervious strata, it must be supplemented by artificial drainage. The localities of appearance of return flow are most important. In general, irrigation was initiated along the streams in their lower courses with development spreading therefrom to adjacent higher lands and upstream valleys. With the irrigation of adjacent higher lands which in themselves are usually adequately provided with natural drainage, the limited underdrainage along the borders of the lower valleys becomes overloaded and seepage follows, requiring protective border drains to avoid destruction of valley property.

Project return flow, if of suitable quality and properly located, may be used to replace stream flow belonging to prior appropriations and which under such circumstances can then be diverted for the project. Or project return flow may be used to extend the project area, usually with material reduction in project acre construction costs. Where runoff is limited and arable lands are in excess of the available water supply, development plans should have in view the greatest practicable use for all return flow. The solution of these problems requires careful estimates of the quality, quantity, and seasonal distribution of return flow.

Bureau of Reclamation Receives Diploma and Medal of Honor

Sesquicentennial award of high honors for excellence of exhibit at International Exposition, Philadelphia, 1926

Medal of honor awarded to the Bureau of Reclamation (reduced about one-half)

THE Bureau of Reclamation has received recently a diploma of award and a medal of honor from the bureau of awards of the Sesquicentennial Exhibition Association for the excellence of its exhibit at the Sesquicentennial International Exposition at Philadelphia. Reproductions of these are shown in the accompanying illustrations. (See back cover page.)

The diploma of award was designed by Frank V. Dumond, artist. Its significance is in the dominant figure of "Spiritual and National Consciousness," offering the palm of peace and the wreath of laurel at the National Altar upon which is the Liberty Bell emitting the eternal flame of Liberty from which the Arts and Sciences light the lamps and torches of creative imagination and pass them into the hands of Industry and Commerce to illuminate and inspire their activities. The upright panel to the left represents the year of Independence. The upper half of this panel is a portrait of George Washington with a background of the flag of his day. Beneath him are the supporting human elements of his struggle—the Patriot Soldier, the Woodsman, and the Pioneer.

The panel to the right in its upper half presents the figure of Liberty at the moment of the Centennial Exposition against a background of the flag at that time. Beneath her are the contemporaneous supporting human activities of Agriculture, Metal Working, and Mining. A slight Pennsylvania note is given through the keystones employed in these panels.

In the main central part of the composition are epitomized suggestions of mining and of modern blast furnaces and also Agriculture as a background to the figure of Industry. As a background to the figure of Commerce are the modern railway and the grain elevator, with freight and ocean shipping seen against the skyscrapers of a modern city. The whole idea stresses the irresistible spirit and the unlimited achievement which still arises from the inspiring flame of Liberty. The excerpt from Roosevelt's St. Louis speech is apropos since the design sets forth an idea of what he refers to as the "Higher Life"—or as one might say, Spiritual Guidance.

The medal of honor was designed by Albert Laessle, sculptor. The Spirit of America, awaking to the full potentialities of its 150 years of its independence stands watchful, resourceful, protective, symbolized by the alert and decorative form of a young bald eagle, the mother of freedom who guards the home nest of peace and prosperity.

To stress the fecundity of America and its promise for the future the sculptor has purposely chosen the mother eagle and has placed within the nest the eggs which are the symbol of continuing productivity.

The nest itself, fashioned of oak, bespeaks the strength of the American home and the American Nation, while in the background, whence sprang the eagle of freedom, Independence Hall is outlined against the rising sun of American prosperity, happiness, peace, and contentment.

Charges Collectible Though Water Cut Off

The case of United States *v.* Parkins (Wyoming Federal District Court, 1926, 18 Fed. (2d), 643), although coming up from a reclamation project under the Bureau of Indian Affairs, is of interest to the Bureau of Reclamation and to the irrigation districts and water users' association operating Government reclamation projects.

Defendant Parkins owned 106 acres of irrigable land under the Wind River Indian irrigation project. The act of Congress of August 1, 1914 (38 Stat., 582), provides that the Secretary of the Interior may fix maintenance charges on Indian irrigation projects, "which shall be paid as he may direct." For the Wind River project the maintenance charges for 1914 to 1919 were fixed at 60 cents per irrigable acre, for the years 1920 to 1923 at $1 per irrigable acre, and for 1924 at $1.50 per irrigable acre "for each and every acre of irrigable land under said project."

Defendant Parkins in 1921 failed to pay these charges, and the water was shut off. He made application for an extension of time to pay the charges then due, which he agreed to pay before October 1, 1921. He was then given water, but failing to pay either the back charges or the charges for later years, the water was again shut off, so that the defendant received no water for the years 1922 to 1924. The suit was brought by the United States to recover maintenance charges, including charges for 1922, 1923, and 1924. The defendant maintained that for the years 1922, 1923, and 1924, he did not receive water, and therefore that for these three years he could not be charged for the use of it.

The court says:

The answer to this by counsel for the Government is that the Secretary of the Interior being authorized by Congress to make rules and regulations for the government of such projects, and fix maintenance charges, providing the manner in which they shall be paid, which in this instance is admittedly upon the basis of irrigible acreage under the project, the obligation of the defendant became fixed and definite, and is recoverable in an action brought for that purpose. In this we see no defect in establishing the obligation of the defendant, he having been during all the period the owner of the land for whose benefit the water was used or might have been used. That he did not have the use of the water for the years 1922 to 1924 was owing to his own fault in either failing to pay the assessed charges or in making satisfactory arrangements for the use of the water upon agreement to pay in the future.

United States may not by Contract Assume Liability for Death or Personal Injury

IN a decision dated July 13, 1927 (A–19031), and addressed to the Secretary of the Interior, the Comptroller General holds that the United States may not by contract assume liability for claims based upon personal injury or death. In connection with the Salt Lake Basin project, Utah, the construction of the Echo Reservoir is planned. Within the flow line of the reservoir there are certain tracks of the Union Pacific Railroad Co. that must be moved to higher ground before the reservoir is filled. In negotiations with the railroad company for the moving of its tracks, the company insisted upon the insertion in the contract of an article by which as a part of the cost of the work the United States would reimburse the company for all cost and expense because of liability growing out of personal injuries or death or property damage incident to the work of moving the tracks.

The Comptroller General says: "It is recognized it might be argued as you state, 'that the reclamation laws have authorized the Secretary to construct reclamation works and to make such contracts as are reasonably necessary to accomplish this purpose, and that the indemnification of an indispensable contractor for the loss and expense he may incur in the doing of work for the United States is reasonably necessary for the accomplishment of work,' but this office can not agree with your suggestion that the argument is plausible in view of the fact that legislation for many years has authorized payment of claims under certain circumstances for loss or damage of property but has failed to include claims for physical injuries and death. The Congress has reserved to itself the consideration and disposition of such claims. * * * You are advised that you may properly stipulate for the assumption by the United States, not to exceed the amount of available appropriations of claims for loss or damage caused to owners of land or other private property in the removal of the railroad tracks, etc., in question in connection with the construction of the Echo Reservoir, but unless and until Congress shall have authorized stipulations to indemnify payment of personal injury and death claims, you are not authorized to enter into such a stipulation in the instant matter."

State Highway Systems In Reclamation States

More than 13,600 miles of earth roads included in the State highway systems of the 48 States were surfaced by the several highway departments in 1926. The following tabulation gives the figures for the Reclamation States:

State highway systems in reclamation States

State	Total mileage in State systems	Existing surfaced mileage at end of 1926	Mileage of new surfacing placed during year, including reconstruction
Arizona	2,031.4	1,421.5	75.0
California	6,582.1	3,537.9	265.4
Colorado	8,966.6	3,499.3	295.3
Idaho	4,668.4	2,437.6	269.4
Montana	7,957.2	926.9	119.2
Nebraska	6,256.0	2,764.1	833.8
Nevada	2,996.0	1,022.6	189.7
New Mexico	9,214.4	1,684.8	73.9
North Dakota	6,837.8	1,335.4	539.4
Oregon	4,468.6	3,220.4	293.6
South Dakota	5,923.5	2,467.8	444.8
Texas	18,728.0	9,256.3	497.1
Utah	3,248.7	1,189.8	150.0
Washington	3,283.6	2,607.3	96.2
Wyoming	3,136.2	929.1	129.4
Total	94,298.5	38,300.8	4,272.2

EXCAVATION for the foundation of Gibson Dam, Sun River project, continued during the month on both north and south abutments, resulting in the removal of 5,500 cubic yards of solid rock and 2,600 cubic yards of earth and loose rock.

Yuma Mesa Grapes Bring $200 a Ton

Thompson seedless grapes grown on the properties of Dr. Harry Reese, on the Government experimental station land and the Morrell and Lane vineyards on the Yuma Mesa have been contracted for at $200 a ton, on the vine, according to the Yuma Morning Sun.

Mulford Winsor purchased the grapes and intends to ship them to the eastern markets.

It is believed that the Yuma Thompsons are the first of this variety to move, first shipments having been made about the middle of June.

Crop Prospects Good For Idaho Projects

With soil and climatic conditions ideal, the rapid filling of reservoirs, and the arrival of warmth and sunshine to counteract the backward spring, general conditions in Idaho have been reported by A. H. McConnell, secretary of the Central Western Shippers' Advisory Board of Idaho, to be the most favorable, as reported in the Burley Bulletin, Minidoka project.

Estimates furnished Mr. McConnell by commodity committeemen place shipments of lambs at 3,300 cars, fruits and vegetables 6,500 cars, prunes from 1,800 to 2,000 cars, cherries 20 cars, onions 500 cars, early potatoes from 12 to 15 cars, lettuce 15 cars, potatoes 20,000 cars, beans 1,600 cars, canned goods 80 cars, and cattle 1,000 cars.

Increased production of dairy products, eggs, and dressed poultry is indicated. Increased acreage and ideal weather conditions furnish the basis for the prospect that Idaho will have a larger tonnage of small grain to move this year than at any time during the past 10 years.

Payment of Irrigation District Taxes

In the case of Horsefly Irrigation District *v.* Hawkins (decided by the Supreme Court of Oregon, April 5, 1927, 254 Pac. 825), it was held that an Oregon taxpayer may not divide his taxes, paying his other taxes, but leaving his irrigation district taxes unpaid. The court says: "The law contemplates that all the taxes against lands, in such a district, should be paid together. An owner of lands in a district of either kind mentioned (irrigation or drainage) does not have the right to pay the other taxes upon his property and leave the district taxes unpaid, and then defeat their collection in the regular manner."

Organization Activities and Project Visitors

DR. ELWOOD MEAD, Commissioner of Reclamation, left the Washington office on July 10 for a short trip to the West. He will accompany Secretary Work over several of the projects. On August 1 Doctor Mead plans to sail for Palestine for a study of and report on the reclamation work in that country under the jurisdiction of the Zionist Organization.

P. W. Dent, former assistant to the commissioner, has been appointed Assistant Commissioner of the Bureau of Reclamation. He remains in charge of the legal work as chief counsel.

George C. Kreutzer, director of reclamation economics; Charles A. Bissell, chief of the engineering division of the Washington office; and R. T. Bladen, jr., photographer, left the Washington office by automobile on July 10 to visit and photograph a number of the properties in the South suggested for study as typical examples of opportunities for planned group settlement.

E. R. Dexter has been reinstated as instrumentman on the Grand Valley project.

F. H. Henshaw, district engineer of the United States Geological Survey, was among the recent visitors on the Klamath project.

Rhea Luper, State engineer of Oregon, and B. E. Hayden, reclamation economist, visited the Vale project during the month.

Ray P. Teele, Porter J. Preston, and Charles A. Engle who are making an engineering and economic survey of reclamation and Indian irrigation projects, spent several days recently on the Okanogan project.

Alan B. Sheldon, of the Denver office, has been transferred to the Kittitas division of the Yakima project.

C. W. Wood, junior engineer, has been transferred from the Guernsey Dam, North Platte project, to the Kittitas division, Yakima project.

Ex-Governor J. G. Scrugham, special adviser on the Colorado River development, was a recent visitor at the Denver office.

Karl Keeler, formerly in the drafting section of the Washington office, has been transferred to the Truckee-Carson investigations.

Standardization Basis of Better Marketing

Standardization of farm products is the definite foundation on which rest most of the individual functions which make up the whole process of marketing, according to Lloyd S. Tenny, Chief of the Bureau of Agricultural Economics of the Department of Agriculture.

"Standardization facilitates the settling of disputes between shippers nad dealers; it is the only safe basis upon which equitable inspection services can be built at shipping points and markets; it is especially useful in cooperative marketing by affording a basis for pooling the products of various growers; it is a prime requisite in administering the United States warehouse act."

Barry Dibble, former project manager of the Minidoka project, was on the project recently collecting data for a report on credits for the Burley and Minidoka irrigation districts.

J. H. Jacobsen, crop statistician of the United States Department of Agriculture, with headquarters at Boise, Idaho, visited the Burley office of the Minidoka project recently to check up on the crop situation.

An appraisal of the Payette division lands on the Boise project has been completed by a board comprising B. E. Hayden, reclamation economist, representing the Department of the Interior; O. A. Cox, farmer, representing the Black Canyon district; and Frank T. Morgan.

Among recent visitors to the Riverton project were Gov. Frank C. Emerson, of Wyoming; Fred W. Sargent, president; G. B. Vilas, general manager; C. T. Dike, engineer of maintenance; F. W. Hillman, assistant engineer of maintenance; H. E. Dickenson, general superintendent of lines west; F. J. Byington, assistant general superintendent of lines east; and seven other officials of the Chicago & North Western Railroad.

John S. Conway, Deputy Commissioner of Lighthouses and a former employee of the Bureau of Reclamation, spent two days on the Lower Yellowstone project. He was particularly interested in inspecting concrete work, of which he was in charge about 1906.

Frank Hill, chief dragline operator, Newlands project, has resigned to accept a position with the Truckee-Carson irrigation district.

Carl Knutson, chief dragline operator, and Andrew Springer, dragline operator, Newlands project, have resigned to accept positions in Mexico.

Recent visitors to the Milk River project included Hon. Scott Leavitt, Member of Congress; W. H. Wattis, general manager, and W. Y. Cannon, local manager of the Utah-Idaho Sugar Co.; C. D. Greenfield, agricultural development agent of the Great Northern Railway; and C. B. Philips, entomologist, State extension service.

Lansing Su, a Chinese student at the University of Idaho, spent two days on the Yakima project inspecting irrigation structures on the Sunnyside division.

W. D. Wood has been employed at Gibson dam, Sun River project, to take charge of the concrete testing laboratory and to act as concrete inspector.

E. J. Bell, jr., of the agricultural college at Bozeman, Mont., accompanied by County Agent Clarkson, visited the Sun River project recently to secure preliminary information concerning the economic survey that is to be made of the irrigated farms on the project.

A. Mitchell, manager of the Western Labor Agency at Sacramento, has made an inspection of the Stony Gorge reservoir site, Orland project, with relation to clearing the timber suitable for fuel purposes.

U. S. GOVERNMENT PRINTING OFFICE: 1927

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards**, Assistant Secretary; **E. O. Patterson**, Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — P. W. Dent, Assistant Commissioner — George C. Kreutzer, Director of Reclamation Economics

W. F. Kuhach, Chief Accountant — C. A. Bissell, Chief of Engineering Division — Hugh A. Brown, Assistant Director of Reclamation Economics

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher		E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	A. W. Walker	Erle W. Shepard	Miss E.M.Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr	H. C. Stetson		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	Nyssa, Oreg	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River [9]	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [10]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg	H. W. Bashore	C. M. Voyen		B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	H. R. Pasewalk	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks [12]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [11]		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [12]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam.	Augusta, Mont	Ralph Lowry [12]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [12]	C. B. Funk		R. J. Coffey	Berkeley, Calif.

[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.
[2] Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District and Gering and Fort Laramie Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.
[9] Operation of Fort Shaw Division assumed by Fort Shaw Irrigation District on Dec. 31, 1926.
[10] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District informally on July 1, 1926, and formally, by contract, on Dec. 31, 1926.
[11] Resident engineer.
[12] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Middle Rio Grande	Albuquerque, N. Mex	C. C. Elder	Middle Rio Grande conservancy district.
Rush Lake	Salt Lake City, Utah	E. O. Larson	State of Utah.
Yakima project extensions	Yakima, Wash	J. L. Lytel	
Pecos River Storage	Denver, Colo	S. O. Harper, Oro McDermitt, and L. C. Hill.	Pecos Water Users' Association and Fort Sumner Irrigation District.
Columbia Basin Project	Lind, Wash	B. E. Hayden	
Truckee and Carson River	Reno, Nev	A. N. Burch	

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.
HUGH A. BROWN, *Editor.*

Thomson College LIBRARY

CERTIFICATE OF AWARD OF MEDAL OF HONOR TO THE BUREAU OF RECLAMATION

(SEE PAGE 126)

I27.5: 1927

NEW RECLAMATION ERA

VOL. 18 SEPTEMBER, 1927 NO. 9

BACK TO SCHOOL. THERE ARE NEARLY 700 SCHOOLS ON THE FEDERAL IRRIGATION PROJECTS

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
WASHINGTON

July 30, 1927.

To the officers and employees of the Bureau of Reclamation:

BEFORE my departure on a two months' vacation in Europe I desire to express my appreciation of your services and my gratification at the increased prosperity of the farmers on the Federal reclamation projects and the satisfactory relations which exist between the bureau and water users on Federal projects. This is due in a large measure to the tact, industry, and interest of the administrative and other officers of the bureau. I feel sure that this year is to be an outstanding one in Federal reclamation, and desire to bear testimony to the contribution made to this by the bureau's staff.

ELWOOD MEAD,
Commissioner.

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 SEPTEMBER, 1927 No. 9

Interesting High Lights on the Reclamation Projects

ONE of the farmers on the Newlands project, Nevada, harvested a crop of $20 gold pieces recently while digging post holes for a corral fence. About $1,200 was found, and it is supposed that the money was buried about 40 years ago by some one who had stolen it. Most of the farmers on the projects are digging gold out of the land in the form of agricultural products.

AT Stony Gorge Dam, Orland project, California, an average force of 163 men was employed during the month in placing 2,344 cubic yards of concrete, excavating 241 cubic yards of earth and loose rock and 3,695 cubic yards of solid rock, and in placing 59,300 pounds of reinforcing steel. At the end of July the dam was 38 per cent completed.

THE season's apricot crop on the Orland project was disposed of largely to Sacramento canneries through the local marketing association of apricot growers.

ON the Uncompahgre project, Colorado, the Colorado Potato Growers Cooperative Association is planning to handle the bulk of the potato crop and also a large part of the onion crop.

THE recent closing of the Boise Creamery Co.'s plants at Boise and Meridian, Boise project, Idaho, on account of insufficient capital will probably result in reorganization on a cooperative basis and on a much larger scale, including powdered milk among the products.

THE Boys and Girls Junior Farm Bureau Camp was held at the University of Nevada farm at Reno recently. The Newlands project had a representation of more than 60 members out of a total of 319, and succeeded in capturing several prizes.

DAIRYING continues to maintain an important place among the industries on the Minidoka project, Idaho. Practically all the milk and cream produced on the project is marketed through the Mini-Cassia Dairymen's Association or sold direct to the cheese factories and small creameries on the project. A milk condensary at Burley, to be known as the Idaho Star Milk Co., is being promoted by San Francisco interests.

THE Southern market for certified seed potatoes from the Milk River project continues firm, and a visit of potato men from the Louisiana district to the project is anticipated shortly to inspect the crop and complete delivery contracts.

WORK has been commenced by the Northern Pacific Railway on a branch line from Glendive to Brockway, Lower Yellowstone project, a distance of 62 miles. This will open up a territory heretofore without railroad facilities.

THE Malin Cheese and Produce Co., Klamath project, had added improvements to its plant to the value of about $8,000, and now manufactures butter, ice, and ice cream in addition to its regular output of 40,000 pounds of cheese a month.

THE Belle Fourche project is decidedly on the upgrade. The sugar factory has completed the installation of machinery, and housing erection is making excellent progress. The three new pickle stations at Newell, Vale, and Fruitdale are completed and ready to receive the cucumber crop. Laying of rails on the Vale beet spur will be completed shortly. A new elevator is to be erected at Vale by the Tri-State Milling Co. to receive this year's crop. Graveling of State highway 212 through the project began early in August.

AT least $90,000 is invested in poultry houses on the Newlands project; and the 70,000 hens are producing on an average 75,000 dozen eggs a month, worth approximately $22,000.

DURING the month 10,000 posters, advertising opportunities for homeseekers on the Tule Lake division of the Klamath project, the Willwood division of the Shoshone project, the Pavillion division of the Riverton project, the Interstate, Fort Laramie, and Northport divisions of the North Platte project, the Belle Fourche project, and the Lower Yellowstone project, were sent to a selected list of post offices in the States of Washington, Oregon, California, Idaho, Utah, Montana, Wyoming, Colorado, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Arkansas, Minnesota, Mississippi, and Louisiana. Large numbers of inquiries are being received daily by the Washington office.

GROWERS on the Okanogan project, Washington, estimate that the apple crop this year will amount to 800 to 1,000 cars.

THE general agent of the Northern Pacific Railway, located at Yakima, has completed recently a summary of the shipments of hay and grain from the Yakima Valley, for the fiscal year 1927, which he estimates have brought returns of $3,000,000 for 1,250 acres of wheat and 7,500 cars of hay. In addition, he estimates as "by-products" of alfalfa hay, $1,500,000 worth of cream, which is marketed annually through the creameries.

ON the Frannie division, Shoshone project, 14,512 pounds of cream were shipped during the month, and on the Garland division the Castberg Creamery purchased 12,200 pounds of butterfat, manufacturing 13,700 pounds of butter and 1,600 gallons of ice cream. Other agencies purchased 3,464 pounds of butterfat.

Economic Notes from the Irrigation Projects

Salt River Irrigation Project Creates Railroad Tonnage

By T. A. Hayden, assistant engineer, Salt River Valley Water Users' Association

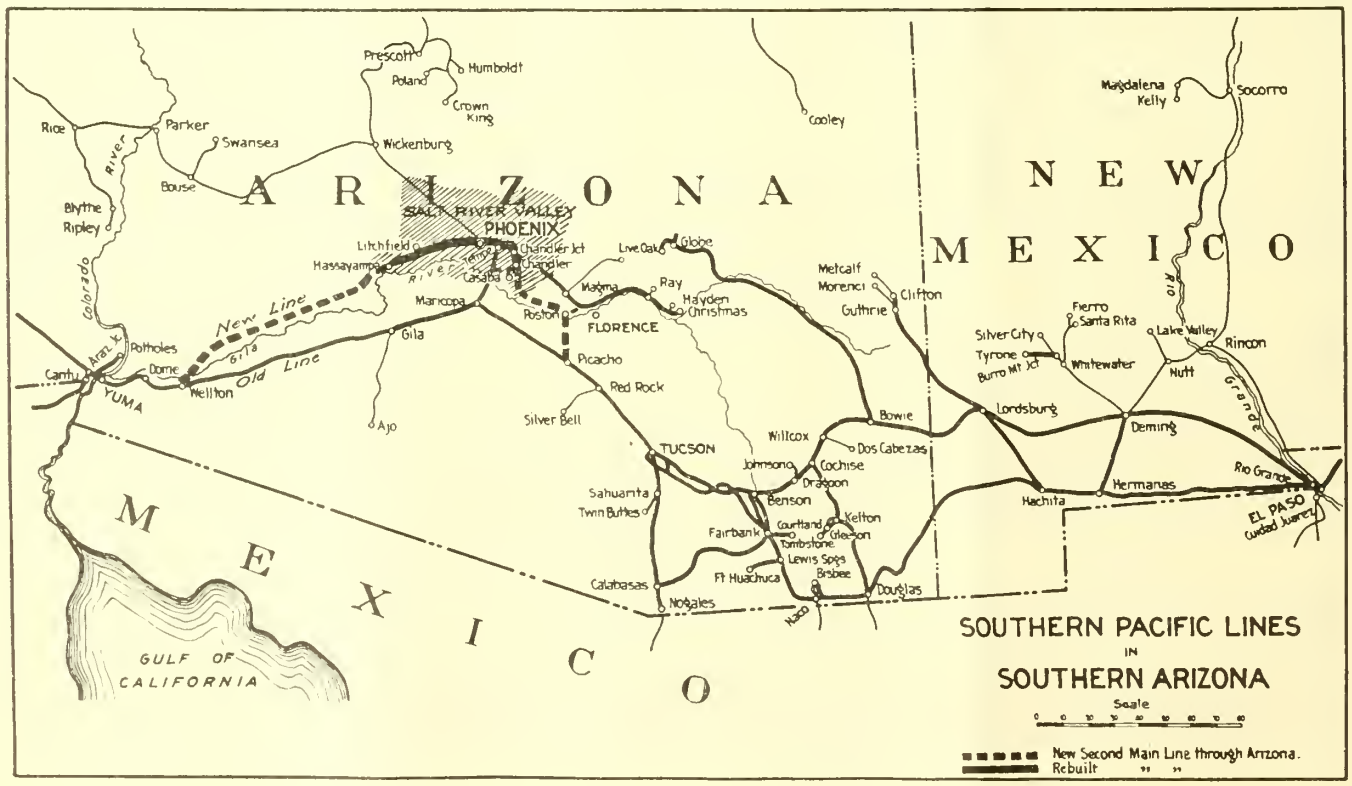
AN expenditure of $15,600,000 was made by the Southern Pacific in 1925 and 1926 in building a new main line through Phoenix and the rich agricultural territory around it. This development was made in spite of the fact that this railroad already had a main line crossing southern Arizona nearly paralleling the new one, the distance between the two being not greater than 40 miles at the farthest point. A branch from the old road connects with Phoenix from Maricopa Junction, 35 miles distant. The apparent duplication of expenditure was made necessary by the enormous advancement in the development of the Salt River reclamation project under the great Roosevelt Dam. Where the old line traversed an unbroken stretch of arid desert, the new one for nearly 100 miles passes through one of the most highly developed agricultural communities in the world.

The total length of the new main line is 163.72 miles, not counting 18.31 miles of old main line double tracked. This is 42 miles longer than the old line, but grades and curvatures on the new line are enough better to practically offset the additional distance. Work was begun January 6, 1925, and the entire 164 miles was placed in service November 1, 1926. All through passenger traffic and the great bulk of freight now pass over the new line.

Construction involved the excavation of 2,700,000 cubic yards of earth, 510,000 cubic yards of cemented material, and 385,000 cubic yards of solid rock. The Gila River is crossed twice, one bridge being 5,000 feet long and the other 3,800 feet. Other major structures are the 4,700-foot bridge across the Agua Fria River and the 2,700-foot bridge over the Hassayampa River. The new line is 88 per cent tangent, one tangent alone being 40 miles in length. The maximum curvature is 3 degrees. The line is fenced throughout and heavily ballasted. Ninety-pound rails and 7 by 10 creosoted ties were used.

Prior to the building of this new line Phoenix and the Salt River Valley were served by a branch from both the Southern Pacific and the Santa Fe. It was inevitable that an agricultural area of nearly 400,000 acres of land, 240,000 acres of which are included in the Salt River project alone and served with water from Roosevelt Dam, should have main-line service. Not only the vastly increased freight tonnage but also the great interest attached to the scenic, climatic, and other features of this area made it certain that sooner or later one of the great roads would build directly through this territory.

The Roosevelt Dam was begun by the United States Reclamation Service in 1906 and was completed in 1911. In November, 1917, the project was turned over to the Salt River Valley Water Users' Association, the farmers' organization comprised of water users under the project. Since that time the water users' association has built two additional dams on the Salt River below Roosevelt, mainly for the generation of hydroelectric power, and has increased the capacity of Roosevelt Reservoir by installing gates in the spillways. The original storage of 1,367,000 acre-feet has been increased by these developments to nearly 2,000,000 acre-feet while the total generating capacity of the project's hydroelectric plants has been increased to 84,000 horsepower. One of the dams mentioned, at Mormon Flat, was completed in 1925. The Horse Mesa Dam, 305 feet high from bed rock to coping and nearly 50 feet higher above



stream bed than Roosevelt Dam, has just been completed. The 7,000 farmers of the Salt River project have a gross income assured from the project power system under existing power contracts of more than $2,000,000 a year. The total investment in project works aggregates $25,000,000

The gross annual returns from field crops alone on the project varies between $16,000,000 and $25,000,000, and for the entire area around Phoenix reaches as high as $40,000,000. The development of more than 300,000 acres of irrigated land in addition to that now under cultivation is actually in progress in the vicinity. A fourth dam is proposed as an additional major power unit of the Salt River project on the Salt River at Stewart Mountain, about 10 miles below Mormon Flat Dam. When this is completed there will exist a string of four lakes stretching along the river for a distance of nearly 60 miles from the lowest dam to the head of the highest lake. Each of the upper dams stands with its foot in the water of the lake created by the dam next below it. Nothing in America exceeds this in scenic properties. The Southern Pacific operates a line of big automobile busses over the famous Apache Trail which traverses the rugged mountains surrounding these lakes. This area bids fair to rival Southern California and Florida as a winter playground, but in this case the tourist attractions have been developed only as an incidential to the creation of a prosperous farming community and a great hydroelectric power system.

Eight hundred rural homes in Salt River Valley are now equipped with electricity for domestic and farm use. The Stewart Mountain development will carry with it the construction of transmission lines for the electrification of every farm on the project. Maricopa County has 500 miles of concrete-paved roads representing an investment of more than $10,000,000. Not a single farm is more than two miles from pavement. The community is developing with great rapidity from the standpoint of population as well as physical improvements. Phoenix has a population of 50,000 and that of the surrounding farm area is about the same. The visitor from the East with a previous conception of Arizona as an arid desert, has a decided surprise in store for him when he finds that he can drive for days through highly developed farm land green 12 months in the year and growing everything from cotton and alfalfa to citrus fruits and grapes.

It is no wonder that Salt River Valley is attracting to it such men as Frank O. Lowden, who, among others, recently purchased a farm and home there. Governor Lowden is quoted as saying that he considers Salt River Valley the finest spot on the globe. Reclamation, based on a sound physical and economic foundation, is solely entitled to the credit for the creation of the most successful irrigation project in the world—a $25,000,000 development that is paying for itself. This is literally true, since *the power revenues of the project will not only pay all operation and maintenance costs, but, in addition, retire all capital-investment obligations.*

The Southern Pacific did not require any special visionary powers to see the handwriting on the wall. It could not sit idly by and watch the growth of a great empire which its main line merely touched along the outer edge. Self-defense, as well as the desire to promote development, required that its line be located through the heart of the field. In this way it will reap the benefits of the improvement which it helps create.

Southern Pacific main line crossing Gila River and serving Salt River project

Thoroughbred Dairy Cattle for the North Platte Project

THREE carloads of thoroughbred Holstein cattle arrived in the North Platte Valley recently from Brighton, Colo., and have been distributed among various herds to aid in building up a better dairy stock and further the dairy industry in general. One car was left at Melbeta, one at Gering, and one at South Morrill. The 107 animals have been allotted in groups of two to four to a farm. The stock was imported through the dairy finance corporation which was organized recently.

This makes three shipments which have come into the valley from the Brighton section in recent weeks. The first carload was sent to Henry, and later another shipment of two carloads, with 58 head, was sent to Minatare. Orders have been placed for 15 additional carloads. These are to come from Wisconsin herds, since the available stock at Brighton has been exhausted.

Eben S. Warner, Phil Rice, and N. M. Lawritson will go to Wisconsin to purchase the stock that has been ordered. Mr. Lawritson has charge of the purchasing operations for the finance corporation. Mr. Rice is cow tester for the county and active in building up the dairy industry.

It is hoped that with the fine, high grade stock added to the various herds the dairy industry in the valley will grow even faster than it has in past years, and that this section will out distance other famous dairy centers.

The Brighton district from which the recent shipment came is famed for its fine Holstein stock and for its output of dairy products. There are said to be 37,000 thoroughbred cattle in that immediate vicinity, with a cheese factory in operation there and a condensing plant only a short distance away, at Fort Lupton. The Brighton herds supply a large part of the dairy products and milk to Denver.

Klamath County Agricultural Economic Conference

AN exceedingly interesting bulletin is the report of the Klamath County Agricultural Conference, held at Klamath Falls, Oreg., February 9 and 10, 1927. The scope of the conference is indicated by the following chapter headings in the report: Boys' and girls' club report; dairy committee report; farm crops committee report; farm management and economics committee report; livestock committee report; poultry committee report; rabbit raising committee report; truck crops committee report; some facts about Klamath County agriculture. Every water user on the projects could reap some benefit from a perusal of this report, and certainly it should be in the hands of every water user on the Klamath project.

The Farm Management and Economics Committee report considers the present resources of the Klamath project from the standpoint of land utilization, available labor, available capital, and the selection of crop and livestock enterprises "in the hope that these resources may be utilized to the best advantage in adopting and developing profitable systems of farming in the district." Many analyses of existing conditions and pertinent suggestions are made by the committee from which the following are quoted:

From the analysis made the committee believes there are many farmers on the project who could materially increase their incomes by making minor adjustments in the organization of the farm. Some minor adjustment in the business may increase the returns, or in some cases it may be profitable to reorganize the farm completely.

The objective in the selection of a combination of enterprises is to obtain the greatest income for the labor of the farmer and his family, and for his investment. This may be accomplished in general by the adoption on individual farms of enterprise combinations which will accomplish the following results:

1. Employ to full capacity, the year round, all available labor on the farm.
2. Minimize the risk of one-crop farming.
3. Utilize all waste and by-products of the farm, as well as all fixed resources, such as buildings, labor, equipment.
4. Make possible a large gross volume of business.

In selecting the enterprise combinations for a particular farm the major enterprises should be supplemented by sufficient minor enterprises to utilize the remaining supply of labor. All enterprises should be in harmony with the collective interest of the district. The following list of enterprise combinations will be found applicable to the respective types of individual farms on the project:

1. Major enterprises: Dairy and poultry. Minor enterprises: Potatoes, alfalfa, grain.
2. Major enterprises: Dairy farm, sheep. Minor enterprises: Alfalfa, hogs.
3. Major enterprises: Potatoes, alfalfa, clover. Minor enterprises: Farm, sheep, dairy, or poultry.
4. Major enterprises: Diary, poultry, alfalfa.
5. Major enterprises: Farm, sheep, alfalfa, potatoes. Minor enterprises: Dairy, poultry, hogs.
6. Major enterprises: Range sheep or cattle, irrigated pasture, and alfalfa.

On each farm the plan should include production of enough alfalfa to meet requirements and sufficient irrigated pasture to supply farm needs. On all farms livestock should be kept to supply fertility and to maintain a steady income the year around. A good home garden should be produced to supply family needs.

The committee makes the following pertinent remarks concerning credit:

The present sources of credit to farmers are as follows:

1. Charge accounts at stores.
2. Local banks.
3. Federal farm loan association.
4. Joint-stock land bank.
5. Private loan companies.
6. World War Veterans' State Aid Commission.

It is the belief of the committee that farmers in general could strengthen their credit in the following manner:

1. File a credit statement based on farm accounts kept by farmers.
2. Talk plans over with banker.
3. Borrow only for production purposes.
4. Pay cash and obtain discount.
5. Work out with existing agencies a plan properly to fund the farm business on a long-time loan basis.
6. Live within income.

It is the belief of the committee that in general bankers are in position to render great service to the community and especially to farmers:

1. By recognizing farming as the ultimate base of prosperity.
2. By keeping in close touch with farm conditions and the farmers' problems.
3. By making farmers' notes, in so far as possible, correspond to time of growing crop.

The members of the farm management and economics committee were as follows: U. E. Reeder, chairman, Pine Grove; G. J. Hilyard, Klamath Falls; R. E. Geary, Klamath Falls; A. C. Cooley, Salt Lake City; J. W. Kerns, Klamath Falls; Leslie Rogers, Klamath Falls; L. P. Sabin, Klamath Falls; and R. S. Besse, secretary, Oregon Agricultural College.

Irrigated Crop Rotations in Western Nebraska Studied

THE value of crop rotation on irrigated lands in western Nebraska is indicated by a series of experiments conducted under the direction of the United States Department of Agriculture at the Scotts Bluff Field Station, results of which are reported in Technical Bulletin 2–T, Irrigated Crop Rotations in Western Nebraska, issued recently by the department.

The experiments included the more important field crops of the region and were so arranged as to afford comparisons as to yield between continuous cropping and simple rotations, and between simple rotations and rotations to which manure was applied or in which alfalfa was included.

With oats the yields from simple rotations have not been much larger than from continuous cropping. The use of manure or alfalfa in the rotation has given substantial increases in yield, and of these two treatments alfalfa has been the better.

With potatoes the yields from the untreated rotations have been larger than from continuous cropping, though the differences have been less during the last five years than during the longer period. Both manuring and the use of alfalfa have given marked increases in yield, with the increases from alfalfa much larger than those from manuring. The crops from the alfalfa rotations have also been less injured by scab than those from the other rotations.

It appears that corn grown in rotation with other crops gives better yields than when grown continuously on the same land. When grown in a rotation where it follows three years of alfalfa the yields are very satisfactory and appear to be increasing with the progress of the experiments.

A summary of five comparisons involving manure and seven comparisons involving alfalfa shows that by devoting the land to alfalfa for two or three years in each rotation the increased yields are substantially the same as those obtained from an application of manure at the rate of 12 tons per acre.

A copy of the bulletin may be obtained by writing to the United States Department of Agriculture, Washington, D. C.

Ten-Year Crop Value One Billion Dollars

The gross value of crops grown during the last 10 years on land irrigated from works constructed by the Bureau of Reclamation amounted to more than $1,000,000,000.

A tabulation recently prepared shows the cropped acreage, value of crops, and the average value of crops per acre for each of the years 1917 to 1926, inclusive. In 1917 the cropped area was 966,784 acres and the value of the crops $56,462,000. Since then there has been a gradual but steady increase in the cropped area, until in 1926 the area was 2,264,600 acres, and the value of the crops $109,118,300. The yearly value of crops fluctuated widely during the 10-year period, owing to conditions created by the World War. These values reached their peak in 1919, totaling $152,978,890.

The average acre value of crops for the 10-year period was $53.42, which is far greater than the acre value of crops in the United States as a whole. Statistics show that during the 10-year period the average value of the 10 leading crops in the United States, which represent nearly 90 per cent of the total area of crops, ranged from $14.45 to $35.74. The high area average on reclamation projects is the result of an adequate water supply and improvements and cultivation above the average. The State of Washington, in which the Yakima and Okanogan projects are located, showed the highest per-acre value of crops during the 10-year period, ranging from $77.30 to $385. In contrast, the lowest per-acre value is shown in Montana, where the Huntley, Milk River, Sun River, and Lower Yellowstone projects are located, ranging from only $8.06 to $49.14. These statistics furnish a striking indication of the part Federal irrigation has played in building up a self-supporting population on what were desert solitudes and creating a satisfactory economic life on the land.

Irrigated Crops Worth $60,664,900

One-third of the cropped acreage on the Federal irrigation projects in 1926 was in alfalfa and more than half the acreage in hay and forage crops, according to crop data recently compiled by the Bureau of Reclamation, Department of the Interior. The value of the 1,291,300-ton alfalfa crop was $11,639,000, or nearly one-fifth of the total value of all crops. About one-fourth of the total value is represented by all hay and forage crops.

Cotton was grown on 209,850 acres on five projects, producing 165,670 bales of 500 pounds each, and 76,800 tons of seed, the two products being valued at $13,625,000, or 22½ per cent of the total value of all crops.

Other crops valued at more than $1,000,000 each were corn ($1,056,500); wheat ($4,219,000); onions ($1,354,000); white potatoes ($5,961,000); garden truck ($5,664,000); apples ($2,570,000); citrus fruit ($1,053,600); and sugar beets ($4,512,600).

The total cropped area was 1,361,470 acres, producing crops valued at $60,664,900, or $44.56 per acre.

Tieton Growers Have Fine Crops

The Yakima Morning Herald, in a recent article, sizes up the crop situation on the Tieton division of the Yakima project, Washington, as follows:

With a good pear crop and a 100 per cent apple crop in sight Tieton growers are looking forward to the opening prices with complacency.

A canvass of the situation made recently indicates that they are expecting $2 a box for their pears and holding for $2 a box for their Jonathans.

Pears will be ready to come off the trees about August 20 according to recent estimates. Apples are making a good growth and are beginning to show color. In many places props are being placed to help the trees bear the loads. The apple crop will be a record one for the district, in quantity, size, and color, it is predicted, and growers feel that they can demand the best the market has to offer.

Is Yakima Prosperous?

The answer to the above question is found in the following 11 reasons why Yakima Valley residents have reason to be happier than usual, as printed in a recent issue of the Yakima Valley Progress:

1. From 10,000 to 11,000 cars of apples with one of the shortest national crops in 20 years and only a 46 per cent crop in the United States.
2. A potato tonnage increased from 8,000 cars to at least 9,000 and possibly 12,000 cars.
3. Substantial soft fruit crops with high prices.
4. The taking of long-time leases upon business property totaling hundreds of thousands of dollars.
5. Establishment of numerous new business houses and many changes and enlargements.
6. City building permits amounting to $563,385 during the past six months.
7. City bank deposits $94,153 greater than last June 30. Total deposits are $10,078,000.
8. Announcement by the Federal Government that its program calls for the spending of $25,000,000 in the Yakima Valley toward placing water on arid lands during the next 10 years.
9. An adequate water supply for all crops, 611,000 acre-feet in storage.
10. A school building program for the county totaling $578,000 with like activity being carried on by the churches.
11. An increase of 6 per cent in the county school census. Total now 23,193.

Reclamation Project Livestock Inventory

A recent inventory of live stock and farming equipment on the Federal irrigation projects shows a total value of $32,515,900, an increase over the preceding year of $2,086,200. Livestock was valued at $20,391,100 and equipment at $12,124,800. Horses and mules numbered nearly 90,000 and were valued at almost $5,000,000. The 67,000 beef cattle were valued at $2,398,800 and the 112,250 dairy cattle at $7,447,200. The projects reported 274,700 sheep valued at $2,323,100; 92,260 hogs at $1,215,000; 1,844,300 chickens, turkeys, ducks, and geese at $1,894,000; and 37,870 hives of bees valued at $246,450.

The largest livestock value, amounting to $3,423,600, was found on the Salt River project, Arizona. Other projects reporting livestock valued at more than a million dollars each are the Boise and Minidoka projects, Idaho; North Platte project, Nebraska-Wyoming; Newlands project, Nevada; Rio Grande project, New Mexico-Texas; Strawberry Valley project, Utah; and Yakima project, Washington.

Engineering Board Studies Owyhee, Deadwood, and Gibson Dams

A. J. Wiley, D. C. Henny, and W. H. Nalder constitute board

A BOARD of consulting engineers has been appointed for the purpose of considering and reporting upon various matters in connection with the design and construction of three large dams planned for early construction or already under way by the Bureau of Reclamation, as follows: Owyhee Dam in Oregon, Deadwood Dam in Idaho, and Gibson Dam in Montana.

The members of this board are: A. J. Wiley, of Boise, Idaho; D. C. Henny, of Portland, Oreg.; and W. H. Nalder, of the Denver office of the Bureau of Reclamation. Associated with these in the consideration of the respective dam sites will be the following: At Owyhee, F. A. Banks, construction engineer; at Deadwood, R. J. Newell, project superintendent, Boise project; and at Gibson, George O. Sanford, project superintendent Sun River project, and Ralph Lowry, construction engineer.

Owyhee dam site. It is about 400 feet from the water to the top of the first cliff on the left and about 800 feet to the main land table

The Owyhee Dam is to be located in a canyon section of the Owyhee River about 20 miles above its mouth and will have a total height from foundation to parapets of 360 feet, making it 11 feet higher than the world's highest existing dam, namely, Arrowrock, completed by the Bureau of Reclamation in 1915. Owyhee Dam will provide a storage capacity of 595,000 acre-feet of water, to be used for the irrigation of 124,000 acres of land, a portion of which is now afforded a partial water supply from the Owyhee and Snake Rivers.

The problems to be considered by the engineering board in connection with the Owyhee Dam are outlined by Chief Engineer R. F. Walter, of the Bureau of Reclamation, as follows:

(*a*) Suitability of the site for a dam of the proposed magnitude in view of the foundation conditions as disclosed by geological reports and drilling and testing at the dam site.

(*b*) Additional foundation exploration not now definitely contemplated that should be performed before final designs for the dam and related works are prepared.

(*c*) Best approximate position for the dam, taking into consideration all features including the probable future construction of a plant for the development of electric power.

(*d*) General type of dam most suitable for the conditions to be met. It is anticipated that a definite recommendation can be made at this time as regards the choice between the arch dam and the gravity dam. In the event an arch dam is recommended, further study will be necessary before decision is made regarding the type of arch, and this decision can await later consideration by the board members.

(*e*) Recommended controlling stresses to be permitted in the detailed design of the dam.

(*f*) Source of concrete aggregates to be used, particularly as to the choice between shipped-in and manufactured aggregates, taking into consideration the transportation and construction conditions. Final decision in this matter, especially as to the choice between the sources of shipped-in material, will be affected by the results of tests not yet completed.

Dr. Warren H. Smith, geologist, of Eugene, Oreg., has been appointed as a consulting geologist to examine and advise as to the geological conditions disclosed by the recent diamond drilling. It is expected that he will make his examinations of the field conditions immediately in advance of the meeting of the board, and it is hoped that he will

be present at the time the board meets to give advice.

Deadwood dam is planned to raise the water surface of the Deadwood River, a tributary of the Payette, 113 feet, forming a reservoir with a storage capacity of 101,000 acre-feet, to provide storage for the Black Canyon division of the Boise project and adjacent lands. Estimates have been prepared for two types of dam, a concrete arch and an earth and rock fill embankment. The principal duty of the engineering board will be to advise as to the more suitable of these two types.

The points to be considered by the board at this site are outlined as follows:

(*a*) Availability of suitable sand and gravel for concrete construction. In this the question of the amount of such material that is available is believed to be of great importance. It is estimated that a concrete arch dam of the required height will contain not to exceed 65,000 cubic yards of concrete.

(*b*) The availability of sufficient suitable material for an earth and rock fill embankment as an alternative to a concrete masonry dam. It has been estimated that such an embankment would require about 313,000 cubic yards of clay, sand, and gravel material and about 140,000 cubic yards of rock-fill material.

(*c*) Foundation conditions as disclosed by test pits and surface conditions and the effect of these foundation conditions on the type of dam to be built.

(*d*) Effect of the short construction season and the long haul for construction materials on the type of construction to be adopted.

Gibson dam, contract for the construction of which has been awarded to the Utah Construction Co., will be of the massive concrete arch type with a maximum height of 195 feet and a crest length of 900 feet. It will store 90,000 acre-feet for the irrigation of lands on the Sun River project of the Bureau of Reclamation. Excavation for the base of the dam and the spillway was begun by the contractor in December, 1926, and has progressed to a point where it is desired to start concreting in a short time.

The matters to be given consideration here by the engineering board have to do with the suitability of foundation conditions as now exposed, the extent of additional work to be done on the foundations before concreting is begun, the suitability of the contractor's plant for producing from the available materials uniform concrete of the required strength and durability, and the precautions that must be exercised by the construction engineer to insure the best quality of concrete in the structure. The work that has been done for the foundation grouting is also to be considered and any advisable changes outlined.

Frame for tying reinforcing bars at joints, Main Canal, Kittitas division, Yakima project, Wash.

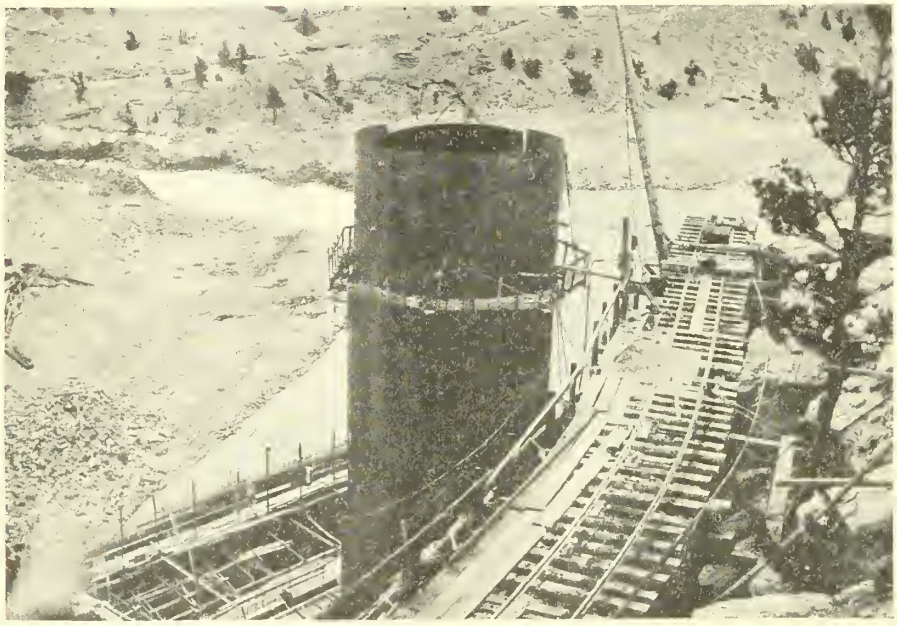
Gibson dam site, Sun River project, Mont., showing excavated foundation on south abutment

Peruvian Conditions For Colonization

A recent issue of the bulletin of the Pan Pacific Union states that in order to determine the advantages which will be granted to national or foreign colonists settling in the mountainous region of Peru the Chief Executive recently published a decree setting forth the terms that will be given them as follows: Ten hectares of land will be granted to each individual settler and 30 to every family. During the first six months a daily allowance of 1 sol will be made to each adult colonist and of 50 centavos to every child under 15 years of age. The colonists will receive free medical care. The Government will provide transportation for them from the port of Callao to their ultimate destination. Agricultural tools and seeds for planting will also be supplied by the Government. The price of the tools, seeds, and transportation shall be refunded to the Government when, in the opinion of the Administration of Colonization and Immigration, the colonist, through the development of his crops, is able to do so. The colonist shall engage to contribute toward the development of a town, having the option of a lot in said town 50 meters deep by 40 in width, whereon to construct a house. (One hectare equals 2.47 acres; one sol equals $0.487 at par.)

The Guernsey Surge Tank, North Platte Project, Nebraska-Wyoming

By R. E. Glover, Associate Engineer, Denver Office



Guernsey surge tank during construction. Workmen on inside were supported on a floating platform.

THE Guernsey surge tank is one of the vital elements of the Guernsey power plant, the first unit of which has recently been placed in operation. This plant develops power from water released from the Guernsey reservoir, and together with the Lingle plant supplies power for industrial, municipal, and project uses in the territory along the North Platte River in eastern Wyoming and western Nebraska.

The location of the plant at the outlet of a reservoir whose primary purpose is for the storage of irrigation water, makes it necessary to operate under widely varying heads. The use of power by various flour mills and for domestic lighting makes it necessary to hold the frequency and voltage fluctuations within narrow limits. Power is supplied for industrial uses to motor units as large as 800 horsepower, whose intermittent use causes heavy load fluctuations. Water-power plants are inherently difficult to regulate, so that the exacting requirements in this case gave rise to a problem in turbine regulation of unusual interest.

The Guernsey plant is supplied with water through approximately 170 feet of 25-foot horseshoe tunnel connecting with 700 feet of 12-foot circular tunnel. About 5,200 tons of water are inclosed within this conduit, and this great mass must be accelerated or checked each time the load on the turbines increases or falls off. The turbine gates are controlled by a sensitive mechanism which opens the gates if the speed of the turbine drops, or closes the gates if the speed rises above a predetermined value. If the turbines were connected directly to the power tunnel and an increase of load caused the speed of the units to drop, the governor would react by opening the gates. Under this condition the head required to accelerate the water in the tunnel to its new velocity would be taken from the effective head on the turbine, and the first result of a demand for extra power is an actual falling off of the output of the turbine. On a decrease of load the converse is true, in that the closing of the turbine gates causes the pressure to rise, and the first result is an increase in the power output of the turbine. To gain an idea of the magnitude of the transient power deficiency for this plant, a computation was made on the basis of an instantaneous load addition of 1,360 horsepower, or 20 per cent of the full load capacity of the completed plant. The calculation showed that the power supply would be deficient for nearly eight seconds with an accumulated deficiency of 27,000,000 foot-pounds of energy. This is a somewhat greater load change than is expected, but the computation shows that a flywheel some sixty times as large as could be obtained would be necessary to provide satisfactory service. The need for shortening the distance from the turbines to a free-water surface, as well as the necessity for limiting the pressure rise following a release of load to what could be safely borne by the power tunnel, made the installation of a surge tank imperative.

As finally designed, the surge chamber is a steel tank 85 feet high with a uniform inside diameter of 22 feet and rests directly on the concrete anchor at the junction of the power tunnel and the penstocks. This arrangement is mutually beneficial since the anchor not only supports the surge tank but the surge tank and the water it contains provides a large proportion of the weight necessary to insure the security of the anchor. The uniform diameter from top to bottom is necessary both to provide the required area throughout the total range of head and to shorten the effective penstock length as much as possible. The resulting appearance is somewhat unusual and is said to have caused one engineer to remark that "the Guernsey plant is the only water power plant in the world with a smokestack."

The proportioning of such a tank so that it will properly perform all its functions and at the same time be as economical of material as possible is no small undertaking in itself, since the mathematics is very much involved. The fundamental physical relations governing the action of surge tanks are expressible in two parametric differential equations of the first order, involving the three variables—tunnel velocity, departure of water surface from the normal level in the surge tank, and time. These equations are of peculiar interest to the mathematician since they apparently belong to that class of equations for which no general solution is known. For any particular case, a close approximation to the correct solution may be found by applying the original equations successively over small increments of time. This method is laborous in the extreme and is made doubly so because the desired dimensions can not be solved for directly but must be found by cut and try.

The mathematical difficulty is due to the fact that the frictional resistance to the flow of water is proportional to the square of its velocity, since if the assumption be made (at the expense of accuracy) that the resistance is proportional to the first power of the velocity the equations become manageable and if the frictional resistance be neglected entirely they are easily solvable. The simplicity of the formulas derived on the above bases and the known fact that they give, or can be made to give, results on the safe side, have gained them a wide acceptance among engineers. This is especially true

in the case of the formulas derived by neglecting the friction entirely, because by their use the size of tank required can be solved for directly. It is also usually possible to design the penstock and connection so that the condition of negligible friction assumed is substantially justified in fact, it being highly desirable to reduce friction in the flow line in any case to save power.

It has come about, therefore, that the peculiar mathematical difficulties have caused an important point to be obscured, which is, that friction properly employed may here be turned from a liability into an asset, and may be used not only to decidedly decrease the size of tank required but to improve its operation. These two desirable features are secured in this case, not by increasing the friction to flow in the power tunnel or penstocks but by throttling the connection between penstock and surge tank sufficiently to introduce a calculated amount of resistance to flow. This resistance does not interfere in the least with the normal operation of the turbines, but does materially reduce the amplitude and duration of the surges caused by changes of load. An experienced turbine manufacturer recommended a tank of 35 feet diameter for this installation, based presumably on the accepted formulas and practice. A comparison of the 35-foot open tank with the 22-foot throttled tank shows the profound effect of providing resistance to flow in the surge tank connection. In this case it is provided by bolting an annular ring to the top of the connection to the surge tank, thereby restricting the area through which the water must pass on entering or leaving the tank.

Argentine Land Settlement

An item in a recent issue of the Timberman states that representatives of the principal railway companies in Argentina have been in conference with Doctor De Alvear, President of the Republic, to discuss ways and means of putting into practice an important railway land settlement plan. The scheme is to have a Government concern working with the support of private capital. It was stated that 10 railway companies concerned would set aside $1,650,000 each for land-settlement purposes. The idea of inducing Italian, Hungarian, Austrian, Spanish, and German settlers was discussed. The working basis of the plan is the fostering of agricultural progress in the regions served by the railway lines. A joint organization, to be known as the Railways Colonization Consortium, is to be formed to take charge of the lands received for that purpose.

Farm Electrification in California

From Review of the Pacific

A STRIKING contrast to the rest of the United States is presented by the progress of agricultural electrification in California, where more electricity is used on farms than in all other States combined. Of the power used for agricultural purposes in this State, 42 per cent is electrical and only 18 per cent is furnished by work animals, as compared to 5½ per cent and 60 per cent for the country as a whole, and about 60 per cent of California farm homes have electric lights and running water. Each farm worker in this State utilizes over three times as much power as the average for the United States, and for every hour of human labor used on California farms 1½ horsepower hours are similarly employed. Advocates of agricultural electrification point to the fact that the average net income of the California farmer is larger than that of farmers in any other State and over twice the average for the United States.

FARMERS ENJOY LOW POWER RATES

The extensive employment of electricity for power purposes on California farms has been made possible by a number of factors that have made the rate for electricity in rural districts only one-half that in other States. In the United States as a whole, 70 per cent of the electricity is generated by steam plants, which are usually situated in the large cities in which most of the power is used.

In California, on the other hand, because the high mountains and rapid streams provide an easy means of obtaining power, 80 per cent of the electricity comes from this source and must be transmitted from the ranges in the eastern part of the State to the cities on the western coast. Consequently, on its journey from the generating to the receiving station, electricity must be carried across the large valleys where most of California's crops are grown and is thus available in farming districts.

The second reason for the progress of agricultural electrification in this State is the extensive acreage under irrigation, which is more than 20 per cent of the total irrigated area of the United States. Although about half this area is watered by gravity flow, this method is limited in capacity and distribution and there are about 2,000,000 irrigated acres in California requiring water pumped from rivers or wells. Wherever electricity is available electric motors, because of their ease of operation and maintenance, have replaced gasoline engines or other forms of power for pumping. These operations consume 80 per cent of the electricity used for agricultural purposes in California and provide the major or base load, making it possible for power companies to extend their lines in rural districts.

Still another cause for the low rates for electric service on farms in California, as compared with other States, is the local power companies' policy of placing some of the cost of rural distribution on urban consumers, who ultimately benefit by the subsequent agricultural development.

Drainage by Pumping on Boise Project

Much interest has been aroused on the Boise project in the question of drainage by pumping in the valley by a local engineer and a well-sinking firm. Districts with less than an ample water right and with areas seeped from irrigation on higher lands have been especially singled out. An initial contract has been signed between the Pioneer irrigation district and the company which sinks the wells for one well in the edge of Nampa to discharge directly into the Phyllis Canal. The basis of payment is to be $30 per inch for the yield of the well with a maximum drawdown of 35 feet. It is understood to be the plan to sink a hole 36 inches in diameter and pack the space around it with screened gravel.

Rio Grande Project Plans Exposition

It is understood that instead of a county fair this fall the Rio Grande project, New Mexico-Texas, will hold a project exposition from October 19 to 22. Plans are being made to have exhibits from both the upper and lower valleys. The El Paso County Farm Bureau will join Las Cruces and Dona Ana Counties in preparing for and carrying out the exposition. Committees are busy preparing a premium list which they expect to have completed shortly.

Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

Good business methods in handling crops on irrigation projects afford good homes

Cooperation

It ain't the guns nor armament nor the funds that they can pay,
But close cooperation that makes them win the day;
It ain't the individual, nor the army as a whole,
But the everlasting teamwork of ev'ry bloomin' soul.
—*Rudyard Kipling.*

WHAT meager results we often obtain by working singly as compared to joining our efforts with those of others!

This applies with equal force to each activity in farming operations, as evidenced by the "network" of cooperative organizations operating in this and in foreign countries.

Research into this subject discloses the fact that co-ops exist to such an extent that even an exhaustive survey did not reveal them all. They are organized along lines of every conceivable movement of products.

Cooperative marketing organizations assist materially in the standardization of a product, in improving grading and packing methods, and, as increased production warrants it, broadens out into bigger fields.

Judicious advertising plays no small part in creating a greater demand not only of specific commodities but certain grades; and once a reputation is established for select qualities the demand increases, prices are stabilized, and success of the association is practically assured, if these factors which constitute success are jealously guarded.

Trade names should be properly protected so that there may be no infringements after a demand is created.

One of the outstanding advantages of a cooperative association is the placing of the marketing problem in the hands of experienced men, selected as officers of the association, whose business it is to keep posted on the best methods to employ in the handling of the product to be marketed, on market prices, develop new and broader markets, and relieve the farmer of this worry. He is then free to devote his undivided attention to the production of a good crop that will represent both quantity and quality.

Experience has shown that a successful cooperative marketing association must be founded on a special industry.

Making the Most of the Farm Products

Food, textiles, and other materials used in every home are produced on farms. It is becoming increasingly apparent that the success of agriculture does not rest solely on efficient production and distribution. There must be a closer fit between consumption and production. This means that American home makers must know how to make the best use of the commodities supplied by farms.

Statistics at Washington show that there is a widespread desire for scientific facts on home making. It comes both from home makers and from the agencies that produce and handle the materials the home requires.

Volume production figures show that this country has an abundance of food, yet undernourishment is prevalent. Food habits are being studied to find out whether the difficulty is geographic, economic, or due to lack of knowledge of the simple facts of nutrition.

Many of the fundamental principles of nutrition are not being applied in everyday diets because they have not been translated into forms that can be used by the home maker. Figures on food composition must be compiled and kept up to date, since these are the basic terms used in translating nutrition facts. The close relation between vitamins and health is increasingly emphasized. Vitamin studies must follow to find out in which of the foods these are present and how they are affected by various methods of handling.

A nation-wide study is being made of the factors affecting quality and palatability of meat. Lamb and beef cuts from experimentally fed and slaughtered animals have been cooked by standard methods ready for judging. The results of this long-time study will be a guide toward methods of producing the most desirable types of market meat. Also it will yield many more facts on cooking meats so as to conserve and develop flavor, tenderness, juiciness, and food value.

Home canning of fruits and vegetables, use of soft-wheat flours, vegetable cookery and various other food problems are handled also from the standpoint of sound home and agricultural economy. The whole program aims at teaching the housewife to buy health for the family through properly selected and prepared foods.

Why Sweets are Harmful to Children's Teeeth

Sweets may be harmful to children's teeth in two very different ways. In the first place, children who have the habit of eating a great deal of sweet in the form of large amounts of sugar on cereals, or as desserts, or as candy between meals, are very likely not to get the building foods

they need. Children who have acquired a taste for candy and sweets are not so fond of cereals, eggs, milk, and simple vegetable dishes which are not highly seasoned. These foods are very necessary in the diet, because of the calcium they contain. The calcium builds good health and good teeth.

In the second place, children who eat sweets may have acid saliva in the mouth, caused by slight fermentation of the sugar in solution around the teeth. In time, this acid saliva tends to affect the enamel covering of the teeth. Furthermore, sugar in the mouth serves as a good food for bacteria which are normally present in the mouth. As the bacteria multiply in number, the chances for decay increase. Recent knowledge of mouth hygiene indicates, however, that poor diet has by far the greatest influence on poor teeth.

Trees Suitable for Roadside Planting

Oaks are more generally useful for roadside planting than any other kind of tree. There are species of this tree native to nearly all parts of the country. Maples are next in importance for a large part of the country, but as the most-used species are not well adapted for the purpose, the selection must be carefully made.

The most promising trees for the cooler dry regions are the green ash, black locust, hackberry, thornless honeylocust, and poplars, with boxelder, willows, and poplars for the extremes of cold and drought. In warm dry climates the eucalypts or gums, the palms, the Jerusalem thorn, and the mesquite are good.

Success in roadside tree planting depends on properly locating the plants along the highway, selecting suitable varieties, and adequately protecting them from thoughtless persons, roving stock, and insects and diseases.

The best effects in roadside planting are usually produced by giving the predominant place to the common plants of the neighborhood, using introduced plants in subordinate positions. Next in desirability are plants from regions having similar growing conditions either in this country or abroad.

OF a total of 5,257 acres, appraised at $148,257, consisting of 41 parcels of right of way to be purchased for right of way for the Owyhee reservoir, Owyhee project, contracts have been negotiated for 28 parcels totaling 3,408 acres with a total value of $109,410. None of the contracts had been approved at the end of the month.

Cantaloupes are usually money makers on the irrigation projects

Irrigation and Drainage Prevent Alkali Deposits

THE so-called alkali problem on irrigated lands can be prevented or remedied by an adequate system of drainage and the use of enough irrigation water to leach the root zone of the soil, according to Carl S. Scofield, in charge of western irrigation agriculture, United States Department of Agriculture.

Irrigation water always contains some salts, sometimes rather large quantities. When the water is taken from the soil by the plants or lost by evaporation the salts are left in the soil. If the water never penetrates below the root zone, the salts are left in that zone. Continued irrigation deposits more salt and finally makes the solution in the root zone so salty that plants can not absorb water from it.

The only way to prevent the accumulation of salt in the root zone is by applying more water than is needed by the plants for growth, thus leaching the salt from the root zone and carrying it below the danger point. It is not necessary to leach the root zone continuously or that more than a small amount of the water should pass out below. But it is essential to the sustained productivity of irrigated land that the root zone be leached to some extent at least occasionally.

It would not be difficult to solve the problem in this way if all soils were readily permeable to the movement of water. In many irrigated sections the presence in the subsoil of bars or dykes of tight or cemented material interferes with the free movement of excess water in the direction of natural drainage outlets. In such cases it becomes necessary to cut artificial channels through these barriers to afford relief. These artificial channels may be open ditches or covered lines of tile. Much of the trouble from excess salt can thus be overcome by a system of irrigation and of drainage that insures a periodical leaching of the root zone, and that is designed to remove excess salt from the land as well as excess water.

LAND classification on the Vale project is being carried on by the Oregon State Reclamation Commission to determine the amount of unproductive land in the Warmsprings district and to arrive at an adjustment basis of settlement between the district and the bondholders.

CONSTRUCTION has been started by the Farmers' Cooperative Association on a new cotton gin in the upper end of the Valley division, Yuma project.

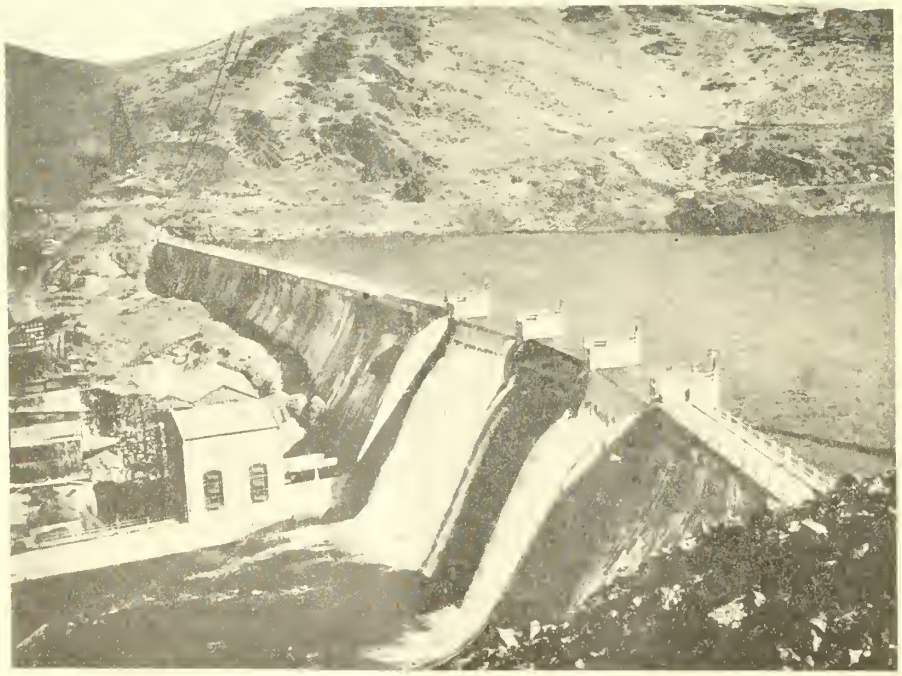
Contract with the Black Canyon Irrigation District for Construction of the Payette Division of the Boise Project

IN the years immediately succeeding the passage of the reclamation act, the Federal irrigation project in the vicinity of Boise, Idaho, was designated the "Payette-Boise project," since it contemplated the irrigation of lands in both the Boise and Payette River valleys. However, the development in the Boise Valley was the first undertaken and the project later became known as the Boise project.

The land in the Payette Valley was generally unentered when the Government project was initiated, but under the stimulus of Government construction the land was soon taken up under the land laws. The amount of Government funds available was not sufficient to permit the simultaneous construction of irrigation works in both valleys, and the entrymen and owners of lands in the Payette division, becoming impatient with the delay in reclaiming their lands, petitioned that the Payette lands be no longer considered a part of the Government project, in order that such lands might be irrigated under private auspices. The Government granted this request and abandoned at that time the plans for the irrigation of the Payette lands.

However, private development did not prove a success, and in the Interior Department appropriation act approved January 12, 1927, there was appropriated under the heading "Bureau of Reclamation" $400,000 for "continuation of investigation and construction, Payette division," Boise project.

On July 27, the First Assistant Secretary of the Interior approved a form of contract to be entered into with the Black Canyon Irrigation District by which the district will pay the cost incurred by the United States in constructing the Payette division, sometimes called the Black Canyon division. There are, it is now estimated, about 56,000 acres of irrigable land under the proposed works, which are: (a) The Black Canyon Dam, already constructed, which will be used as the diversion dam, and a proportionate part of the cost of which the district is to pay; (b) a reservoir or reservoirs with capacity of from 100,000 to 175,000 acre-feet, to be constructed by the United States on the Payette River or its tributaries; (c) a canal system for diverting water at Black Canyon Dam and conveying same to the lands of the divisions; (d) certain pumping plants for irrigating land above the canals and (e) the Black Canyon power plant or an interest therein to supply the power needed for such pumping. The United States is to expend a maximum of $1,500,000 for the construction of new reservoirs and a maximum of $5,500,000 for the proposed canal system, drains, etc. The district is to repay such expenditures and $715,000 for the use of the Black Canyon Dam as a diversion dam and a maximum of $445,000 for the use of the existing pumping plant.



Black Canyon Dam, Boise project, Idaho.

The district is to pay the construction charge in 39 annual installments, without interest. The last 34 installments are to be equal, but the Secretary has the option to make the first five installments smaller.

The district is to make the necessary levies in order to meet these installments as they come due and is to pay the amount due irrespective of default of some of the water users in meeting the assessments on their land, the district thus assuming what the water users usually refer to as "joint liability." The United States has the power to refuse delivery of water to the district in the event of default for a period of 12 months or more in making payments due to the United States.

Speculation has been the bane of many irrigation projects, the land being sold at progressively higher prices in advance of the time when water is ready for delivery. The result of making the irrigable area of a project the football of speculation is almost always harmful. By the time water is ready for delivery, the land is found in the hands of a disappointed speculator who has bargained to pay much more than it is worth and who does not desire to farm but to sell again at a profit. He has bought on a slender "margin," giving a mortgage for the remainder of the purchase price, and he is always in doubt whether to throw up the sponge or to hold on, which latter means, of course, to undertake the expense of leveling the land for irrigation, meeting the water charges, planting crops, and building houses and other improvements. He is generally the victim of a speculative fever, since there is at the present time in the West very little value in raw irrigable land, the value it has under irrigation being due to the cost of the water supply, and to the expense which the landowner must undergo to level his land and subdue it for irrigation.

Article 35 of the contract attempts to reach the heart of the problem by providing an appraisal in the county recorder's office showing the value which disinterested appraisers have given the land after a careful investigation, and by requiring that all sales in excess of the appraised price shall be reported, the excess price received being divided equally with the project. In this manner sales of land at excessive prices are not forbidden, but if such sales are made the land concerned is to receive payments on the water charges to be due therefrom to the extent of one-half of the excess of the sale price over the appraised valuation. The landowners are to agree to these con-

ditions, and the contract contains the following provisions:

The United States shall not be obligated to make any expenditures for storage construction in pursuance of this contract until the owners of at least 60 per cent of the total area of all entered land or patented lands in the Payette division susceptible of irrigation from the works to be constructed hereunder shall have executed, for themselves and successors in interest, recordable contracts in a form approved by the Secretary, accepting and agreeing to the terms of this contract, and particularly of this article. The United States shall not be obligated to make any expenditures for the construction of a distribution system hereunder until at least 80 per cent of the said lands shall have been so obligated. No water shall be supplied to any lands until such contracts shall have been executed by the owners thereof.

Congress, in the reclamation laws, has repeatedly manifested a determination that water is not to be furnished to lands in private ownership exceeding the area sufficient to support a family and in any event to more than 160 acres in one ownership. It manifestly would be improper for public funds to be used for the enrichment of a few large landowners. The contract enforces the law relative to large holdings by providing for an appraisal of land in large holdings, for the selection by the owner of the 160 acres he desires to retain, and for the sale of the remainder at or below the appraised price. The owners of such land are to execute recordable contracts binding the land to the requirements of the law and of the contract with the irrigation district. If a large landowner refuses to sign such contract, he is not entitled to receive water although his land is nevertheless to be assessable for the project charges. The large landowner has three years after water is ready for delivery to his land within which to dispose of his excess property by sales at or below the appraised price. If he fails to dispose of the excess land within this period, the Secretary is empowered to order the land into the market and sell it at such price as may be obtained therefor.

Uncompahgre Poultry Growers Organize

The poultry growers of Montrose and Delta Counties, Colo., together with a number of growers from Mesa County, held a community dinner recently at which plans were perfected for the organization of a cooperative poultry marketing association. Organization committees were named, and it is anticipated that the association will control this year approximately 100,000 hens and 6,000,000 eggs.

Section 3709, Revised Statutes, Not Applicable to Contracts for Purchase of Right of Way

THE United States is preparing to construct the Echo Reservoir, Salt Lake Basin project, Utah. Lines of the Union Pacific Railroad Co. are located within the flow lines of the reservoir, and it is necessary to remove the railroad lines to higher ground. The company proposed to enter into a contract by which it would do certain work on a cost-plus basis in connection with the change in location of its lines. The Comptroller General was requested to render advance decision whether, in view of section 3709, Revised Statutes, payment could be made on the cost-plus basis, if the contract were entered into. The decision permitted such payments to be made, the Comptroller General stating (decision dated August 4, 1927, A-19031):

The railroad company may, as an incident to the giving of its consent to the transfer of its present right of way to the United States and the removal of its lines to a different location, exact as a condition that the Government permit it to remove its lines at the cost and expense of the Government. If it is administratively determined to be more desirable to so contract with the railroad company rather than to acquire the land by condemnation or on an amicable purchase basis, this office will have no objection to the contract, if otherwise proper, when entered into without advertising for the removal of the railroad line to a different location at the cost and expense of the United States. It is to be understood, of course, that such items of cost and expense will not exceed available appropriations and that they represent reasonable items properly chargeable to the United States.

AREA IRRIGATED (ACRES)

ARID IRRIGATION

States	1889	1899	1902	1909	1919
Arizona	65,821	185,396	247,250	320,051	467,565
California	1,004,233	1,445,872	1,708,720	2,664,104	4,219,040
Colorado	890,735	1,611,271	1,754,761	2,792,032	3,348,385
Idaho	217,005	602,568	713,595	1,430,848	2,488,806
Kansas	20,818	23,620	28,922	37,479	47,312
Montana	350,582	951,154	1,140,694	1,679,084	1,681,729
Nebraska	11,744	148,538	245,910	255,950	442,690
Nevada	224,403	504,168	570,001	701,833	561,447
New Mexico	91,745	203,893	254,945	461,718	538,377
orth Dakota	445	4,872	10,384	10,248	12,072
Oklahoma		2,759	3,328	4,388	2,969
Oregon	177,944	388,310	439,981	686,129	986,162
South Dakota	15,717	43,676	53,137	63,248	100,682
Texas [1]	18,241	40,952	61,768	164,283	322,656
Utah	263,473	629,293	713,621	999,410	1,371,651
Washington	48,799	135,470	154,962	334,378	529,899
Wyoming	229,676	605,878	773,111	1,133,302	1,207,982
Total	3,631,381	7,527,690	8,875,090	13,738,485	18,329,424

RICE IRRIGATION

Arkansas				27,753	143,946
Georgia		7,856	8,581		
Louisiana		201,685	387,580	380,200	454,882
North Carolina		3,283	3,422		
South Carolina		29,690	38,220		
Texas		8,700	168,396	286,847	263,464
Total		251,214	606,199	694,800	862,292

HUMID IRRIGATION

Alabama		89	95		
Connecticut		471	379		
Florida		1,538	3,772		
Maine		17	17		
Massachusetts		134	283		
Mississippi		40	114		
New Jersey		73	48		
New York		68	159		
Pennsylvania		814	905		
Rhode Island		40	15		
Total		3,284	5,788		
Grand total, United States	3,631,381	7,782,188	9,487,077	14,433,285	19,191,716

[1] Exclusive of rice irrigation.

Reclamation and Settlement in Peru

THE Bulletin of the Pan American Union for July, 1927, contains an interesting discussion of agriculture and irrigation in Peru, in the form of a letter by Mr. C. W. Sutton, Government consulting engineer, Paita, Peru, to Señor Enrique Torres Belon, who represented Peru at the Recalmation Section of the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, held in Honolulu, Hawaii, in April, 1927. The following extracts are from Mr. Sutton's letter:

"To sum up, the Government in the last six years has constructed works to give complete irrigation to 40,000 acres. Of this total, 34,000 acres have already been colonized and are under cultivation. Within four months the irrigation of 10,000 additional acres will have been completed and will be colonized immediately, and there are under construction other works which will eventually irrigate 365,000 acres more. At the present rate of progress these projects can be completed at the rate of 40,000 acres a year and there is good hope of doubling this speed.

"Many precedents were studied for the colonization of the lands of the Pampas Imperial. As happens in the majority of cases, the land which was to be irrigated was not Government property. The possibility of settling this difficulty in the manner adopted in some other countries by putting an ad valorem tax on the land, reserving to the State the right to apply the tax in conformity with the valuation of the proprietors themselves, or to expropriate the land in accordance with the same valuation, was considered to be inapplicable on account of the strong resistance of the populace, whose elements were almost entirely formed of the owners of large tracts of arid or semiarid land.

"Recourse was, accordingly, had to the following expedient: Congress passed a law offering to purchase from the owners of the pampas half of their land within a certain period at the price of $10 per acre, offering also to sell the water rights required to irrigate the other half which remained in the hands of the original proprietors. If within the period of time laid down the owners did not accept, then the State under the terms of this law could expropriate the whole at a price of $10 per acre.

"The proprietors gladly accepted the conditions, and the Government sold the land in lots varying from 12 to 100 acres. The terms of payment alike for the original proprietors and the new colonists were very favorable to the purchaser. The whole price had to be paid in 25 years, without interest. Interest was only collected upon overdue quotas.

"Apart from the works constructed and colonized under the immediate direction of the Government, there are other works which are being carried out with private capital but with Government assistance. The collaboration of the Government in one case takes the form of allowing the engineers of the State to cooperate with a private firm in drawing up plans with due respect to the public interest and which include a colonization program. In the second case the Government is assuming the debt of the firm and is completing the work at its own cost, thereby securing title to dispose of the lands in small lots for colonization."

New Zealand Finds Readjustment Needed

In a recent article on "Soldier Settlers in New Zealand" in the International Review of Agriculture it is pointed out that in 1920 and 1921 consideration of the question of revaluation became imperative on account of the increasing difficulty found by the soldier settlers in meeting their obligations. The New Zealand Returned Soldiers Association in 1920 urged the setting up of local boards to consider applications for immediate relief pending revaluation. Later, the Government instituted district inquiry boards which reported that the revaluation of soldier rural properties was the only solution, and the Dominion revaluation board was set up in 1923. Review and readjustment of each settler's current account followed in 1924, and at the present time the soldier settlers of New Zealand are in the way of obtaining success. The total amount of capital invested in the scheme was about $90,000,000, and the reductions by the Dominion revaluations board totaled $10,000,000.

The actual construction of a small poultry house is comparatively simple, and poultry keepers who are handy with the use of a hammer and saw can easily build one.

World Irrigated Area

The following tabulation, compiled by the Bureau of Reclamation from numerous sources, shows the estimated irrigated area throughout the world in 1926:

Algeria	400, 000
Argentina	3, 000, 000
Australia	1, 000, 000
British Guiana	100, 000
Bulgaria	20, 000
Canada	400, 000
Ceylon	350, 000
Chile	59, 000
China	1, 000, 000
Chosen (Japan)	2, 000, 000
Colombia	51, 000
Cuba	50, 000
Czechoslovakia	15, 000
Dominican Republic	25, 000
Egypt	6, 000, 000
Finland	4, 000
France	3, 150, 000
French Indo-China	3, 470, 000
French West Africa	5, 000
Guatemala	41, 000
Haiti	52, 000
Hawaii	200, 000
Hungary	35, 000
India	50, 000, 000
Iraq	1, 550, 000
Italy	3, 000, 000
Jamaica	16, 000
Japan	7, 425, 000
Java	8, 350, 000
Madagascar	1, 500, 000
Madeira	75, 000
Mexico	5, 700, 000
Morocco	1, 500, 000
Palestine	25, 000
Peru	1, 000, 000
Philippines	750, 000
Porto Rico	70, 000
Russia	8, 000, 000
Siam	1, 750, 000
South Africa	800, 000
Spain	3, 500, 000
Sudan	100, 000
Syria	400, 000
Turkey	300, 000
United States	20, 175, 000
Yugoslavia	12, 000
Other countries with small areas	75, 000
Total	137, 500, 000

Rattlesnakes Relieve Patrolman's Monotony

The concrete-lined main canal of the Ticton division, Yakima project, Wash., which for 12 miles extends along the precipitous, rocky sides of Ticton Canyon, offers many attractions as a summer home for rattlesnakes. They have patronized it generously in spite of the inhospitable attitude of Vine H. Barr, the patrolman on the second section of the canal, who has killed 30 of them on his beat this summer.

A big one, over which he walked, retaliated by striking him on the leg.

Movable wooden trestle and steel forms for transporting and placing concrete in the Main Canal, Kittitas division, Yakima project, Wash.

Manure Increases Yield of Irrigated Alfalfa

On the Umatilla reclamation project in north-central Oregon, along the Columbia River, the value of manure on alfalfa has been determined by an 11-year experiment under the direction of the United States Department of Agriculture. This project is typical of a number of irrigation projects adjacent to the Columbia River in Oregon and Washington, and the manure-alfalfa experiment was conducted on "lands that appear to be permanently nonagricultural under the practices of irrigation farming."

Manure was applied in 6 of the 11 years at the rate of 8 and 32 tons per acre. The average yield of air-dry hay from the check plot which received no manure was 3.71 tons per acre; that from the plots which received manure six times at the rate of 8 tons per acre was 5.07 tons; and that from the plots which received manure six times at the rate of 32 tons per acre was 6.10 tons.

The average annual increase due to the manure applied at the rate of 8 tons per acre was 1.38 tons of hay and to the application at the rate of 32 tons was 2.39 tons over the untreated check plots. While the manure applied in the latter case amounted to four times as much as in the former the increased hay yield was not quite doubled. Therefore, it is estimated that manure at the lighter rate is 127 per cent more valuable per ton than at the heavier rate.

The first essential in poultry housing is comfort for the birds. Unless they have comfortable quarters they can not be expected to lay well.

Ways to Go Broke

Ten ways for a man to go broke farming:

1. Grow only one crop.

2. Keep no livestock.

3. Regard chickens and a garden as nuisances.

4. Take everything from the soil and return nothing.

5. Don't stop gullies or grow cover crops—let the top soil wash away, then you will have "bottom" land.

6. Don't plan your farm operations. It's hard work thinking—trust to luck.

7. Regard your woodland as you would a coal mine; cut every tree, sell the timber, and wear the cleared land out cultivating it in corn.

8. Hold fast to the idea that the methods of farming employed by your grandfother are good enough for you.

9. Be independent—don't join with your neighbors in any form of cooperation.

10. Mortgage your farm for every dollar it will stand to buy things you would have cash to buy if you followed a good system of forming.—Exchange.

To be comfortable a poultry house must provide plenty of room for the birds, be well supplied with fresh air, and always be dry.

While an abundant supply of fresh air at all times is essential, it is important that no drafts be allowed to sweep through the poultry house.

Improve the Dairy Herd By Bull Associations

Every dairy herd needs a high-class bull at its head if the herd is to be improved. For the dairyman who has a small herd and is short on finances, the cheapest and best way to obtain the use of first-class bulls is through the work of a cooperative dairy-bull association. Such an association is a farmers' organization whose chief purpose is the breeding of better dairy cows through joint ownership, use, and systematic exchange of prepotent dairy bulls of high-producing ancestry.

Through the system of transferring bulls from block to block, the bull association makes it possible to keep the desirable bulls as long as they live or are fit for service. This enables a bull's daughters to come in milk and be tested while he is still owned by the association, and furnishes a means of determining which bulls are siring the high-producing daughters. The bulls that do not get satisfactory daughters are disposed of.

Orchard Irrigation

The production of fruits and nuts on irrigated land has become an important part of the agriculture of the West. The selection of a suitable site is one of the most important factors in establishing a successful irrigated orchard. Success involves also the setting aside of good land, the proper use of irrigation water, and prudence in making the somewhat heavy expenditures required to purchase trees and to plant and care for them until they begin to bear. It is likewise essential to find out the adaptability of the variety of trees to be planted to the climate and soil of the locality, the adequacy and dependability of the water supply, the risk of high water table and alkali, the wages of labor and its quality, and the probable cost of packing, inspection, transportation, and marketing of the fruit. More detailed information is contained in Farmers' Bulletin 1518-F, Orchard Irrigation.

The time and frequency of fruit-tree irrigation depend primarily on the soil-moisture conditions within the root zone. The depth and spread of the roots is of importance in this connection.

Whether or not a dairy herd will be profitable from the very first depends largely on the selection of the foundation stock.

Organization Activities and Project Visitors

DURING the absence of Doctor Mead in Palestine the Washington office is in charge of Assistant Commissioner P. W. Dent as acting commissioner.

A board of engineers, consisting of Oro McDermith, representing the Secretary of the Interior, Louis C. Hill selected by the Pecos Water Users' Association and the Fort Sumner irrigation district, and S. O. Harper, representing the bureau, met in the Denver office recently to complete its final report on the Pecos River investigations.

The advisers appointed by the Secretary of the Interior to review Colorado River matters, consisting of Senator Waterman, former Secretary Garfield, Governor Emerson, Professor Durand, and former Governor Scrugham, met with the Secretary in the Denver office on July 15.

Louis C. Hill, consulting engineer, was in the Denver office recently in connection with his report on the proposed power development at Elephant Butte Dam Rio Grande project.

Fred C. Scobey, irrigation engineer, Department of Agriculture, spent several days on the Grand Valley project measuring the flow in the concrete flume of the Orchard Mesa irrigation district and the steel flume of the project main canal across Indian Waste. He plans to return later to make further tests on siphons, pipe lines, and other structures. Mr. Scobey also visited the Uncompahgre project for hydrographic tests on the Happy Canyon flume of the Montrose and Delta Canal, and plans to conduct hydraulic jump tests at various points on the project during the season of 1928.

District Counsel Stoutemyer, Engineer Willard G. Steward, and Assistant Engineer G. H. Hogue were on the Boise project for several days in connection with the Boise River flood water case.

Superintendent George O. Sanford of the Sun River project visited the St. Mary storage division, Milk River project, recently, and together with Superintendent Johnson of the latter project made an inspection of the conditions along St. Mary Canal and the repair work in progress.

Recent visitors to the Minidoka project included Senator W. E. Borah, Representative Addison T. Smith, George N. Carter, State Reclamation Commissioner, and D. C. MacWatters, of Los Angeles, former manager of the Kuhn interests in Idaho.

John H. Pellen, chief draftsman, Washington office, who has been ill for several months, has returned to work. Lawrence A. Wallace, of the Washington office legal force, has also resumed his duties after an illness of several weeks.

A. N. Burch, engineer, with headquarters at Reno, Nev., continued work on Truckee and Carson River storage investigations.

C. S. Scofield, agriculturist, Department of Agriculture, and Thomas H. Means, former project manager, visited the Newlands project during the latter part of July. Both were interested particularly in drainage development as affecting the permanence of agriculture on the project.

John T. Whistler, representing the Bank of Italy, spent a day recently on the Newlands project looking over lands and properties covered by mortgages held by the Peoples Bank of Sacramento and now owned by the Bank of Italy.

Recently visitors to the Klamath project included Mr. McArthur, secretary of the Oregon Geographic Board, Doctor Levin of the Oregon State Board of Health, and District Counsel R. J. Coffey.

Dr. Warren T. Smith, professor of geology, University of Oregon, arrived at the Owyhee dam site late in July for a geological examination of the dam site.

J. S. Matthews, of Concord, N. H., was on the Belle Fourche project recently to confer with the associate reclamation economist relative to the development and sale of his farm.

The Yakima project was visited during the month by Senator Wesley L. Jones, H. W. Bashore, superintendent of the Vale project, and B. E. Hayden, reclamation economist.

Senator C. C. Dill and Representative Sam B. Hill were recent visitors on the Okanogan project.

Among the recent visitors to the Riverton project were Secretary Work, Chief Engineer Walter, Senator John B. Kendrick, Representative Charles E. Winter, and J. B. Lamson, agricultural agent of the Burlington Railroad.

H. N. Savage, former supervising engineer of the Bureau of Reclamation, spent a day recently on the Riverton project.

John R. Iakisch, associate engineer on the Shoshone project, has been assigned to drainage investigations on other projects, and left Powell at the end of July. I. B. Hosig, associate engineer, has been assigned to secondary project investigations, Heart Mountain division.

E. N. Westervelt, land commissioner, and J. B. Lamson, agricultural agent, of the Chicago, Burlington & Quincy Railroad, were recent visitors to the Shoshone project, Wyoming.

Recent visitors on the Rio Grande project included Thomas Hill, chief engineer of railways, Melbourne, Australia; E. A. Bayley, assistant engineer, department of water and power of the city of Los Angeles; and Consulting Engineer L. C. Hill.

During July 796 visitors were shown through Elephant Butte Dam, Rio Grande project, including 70 members of the West Texas Chamber of Commerce.

Miss Elizabeth von Hagen, clerk, has been transferred from the Yuma project, Arizona, to the Rio Grande project, New Mexico-Texas.

Painting adds to the appearance and durability of buildings. All surfaces should be clean and dry before they are painted.

Buildings should be painted soon after they are constructed to preserve the wood and to prevent cracks from starting between the boards.

U. S. GOVERNMENT PRINTING OFFICE: 1927

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards,** Assistant Secretary; **E. O. Patterson,** Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — P. W. Dent, Assistant Commissioner — George C. Kreutzer, Director of Reclamation Economics

W. F. Kubach, Chief Accountant — C. A. Bissell, Chief of Engineering Division — Hugh A. Brown, Assistant Director of Reclamation Economics

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher		E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	A. W. Walker	Erle W. Shepard	Miss E.M.Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr	H. C. Stetson		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	Nyssa, Oreg	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. R. Fiock	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River [9]	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [10]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg	H. W. Bashore	C. M. Voyen		B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	H. R. Pasewalk	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho		H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [11]		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [12]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam.	Augusta, Mont	Ralph Lowry [12]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [12]	C. B. Funk		R. J. Coffey	Berkeley, Calif.

[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.
[2] Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District and Gering and Fort Laramie Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.
[9] Operation of Fort Shaw Division assumed by Fort Shaw Irrigation District on Dec. 31, 1926.
[10] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District informally on July 1, 1926, and formally, by contract, on Dec. 31, 1926.
[11] Resident engineer
[12] Construction engineer

Important Investigations in Pragress

Project	Office	In charge of—	Cooperative agency
Middle Rio Grande	Denver, Colo	I. E. Houk	Middle Rio Grande conservancy district.
Rush Lake	Salt Lake City, Utah	E. O. Larson	State of Utah.
Yakima project extensions	Yakima, Wash	J. L. Lytel	
Pecos River Storage	Denver, Colo	S. O. Harper, Oro McDermitt, and L. C. Hill.	Pecos Water Users' Association and Fort Sumner Irrigation District.
Columbia Basin Project	Lind, Wash	B. E. Hayden	
Truckee and Carson River	Reno, Nev	A. N. Burch	
Southern investigations	Washington, D. C	C. A. Bissell	States of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee.

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.
HUGH A. BROWN, *Editor-in-Chief.*

Jackson Lake Dam, Wyoming, One of the Storage Dams for the Minidoka Project, Idaho. Teton Mountains in the Background

I 27.5: 1927

NEW RECLAMATION ERA

VOL. 18 OCTOBER, 1927 NO. 10

THE HARVEST

CONSTRUCTION RESULTS

BUREAU OF RECLAMATION

To June 30, 1927

Storage and diversion dams	117
Volume (cubic yards)	20,206,351
Reservoir capacity (acre-feet)	12,556,653
Canals, ditches, and drains (miles)	13,033
Tunnels	110
Length (feet)	155,172
Canal structures	145,294
Bridges	11,174
Length (feet)	262,626
Culverts	12,925
Length (feet)	476,904
Pipe (linear feet)	3,759,800
Flumes	4,550
Length (feet)	836,580
Power plants	35
Power developed (horsepower)	155,903
Telephone lines (miles)	3,350
Transmission lines (miles)	1,761
Excavation (cubic yards)	256,426,258

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 | OCTOBER, 1927 | No. 10

Interesting High Lights on the Reclamation Projects

OPERATIONS at the Kadota fig-preserving plant on the Orland project for the handling of the season's crop of figs have begun. A successful season is anticipated by project growers.

AN exhibition was held recently on the Grand Valley project of the work of the boys' and girls' clubs, which was well attended. The Dairy Cattle Breeders' Association also exhibited livestock and made a very creditable showing.

AT Gibson Dam, Sun River project, it appears that the solid rock excavation for the completed foundation will amount to considerably less than the estimated quantity of 53,000 cubic yards, and the excavated quantity of earth and loose rock will show a large increase over the estimated quantity of 7,000 cubic yards. It is expected that the foundation will be excavated for about $20,000 less than was anticipated under the quantities and unit prices listed in the contract schedule.

AT Stony Gorge Dam, Orland project, the contractor's efforts during the month were directed mainly toward finishing the work within the cofferdam below water level of the creek, which must be done before the winter flood season. If this can be done early enough the south channel will then be inclosed in a cofferdam and excavation will be started there this fall.

ACTIVE interest is being shown in the growing of mint on the Sunnyside division of the Yakima project. Mint from 11 fields has been distilled this past summer, with yields of 25 to 60 pounds of oil of superior quality per acre. This is reported to be considerably better than is obtained in the Michigan and Indiana fields, where most of the world's supply of mint is grown.

AT the end of the month the attorney for the Vale-Oregon irrigation district, Vale project, stated that 9,359 acres had been signed under the "incremented value" contracts and 7,358 acres under the "excess" land contracts.

A THREE-ACRE field of Federation wheat, belonging to Robert DeLong, near Paul, Minidoka project, produced 283 bushels, or an average of 94 bushels per acre. Another high average was obtained on the Mrs. Henry Hite farm, near Rupert, where 700 bushels of Federation wheat were threshed from 8 acres, an average of 87½ bushels per acre.

AT a ram sale at Filer, Idaho, under the auspices of the Idaho Wool Growers' Association, Minidoka project animals brought fancy prices. E. R. Kelsey, of Burley, sold a pen of five buck Hampshire lambs at $43 per head, two Suffolk lambs for $74 each, and one Suffolk for $90. C. W. Thomas and George Reed, also of Burley, sold some fine young rams for $35 to $50 a head.

DURING the month several prospective settlers from Colorado looked over the Lower Yellowstone project and expressed themselves as very agreeably surprised at conditions there. These men have stated that they will return and purchase farms as soon as their beet harvest is over.

THE Hunt-Mayfield cotton gin at Las Cruces has been taken over by the Mesilla Valley Farmers Gin Company, a cooperative farmers organization with a capital stock of $30,000 and a charter applied for. More than 115 farmers subscribed for the stock. A canning factory has been erected at Mesquite and is open for business, and chile growers at Vinton are preparing to erect a plant for drying and canning this product.

AT the request of the Klamath County Potato Growers' Association and in order to advertise Klamath County potatoes, wholesale dealers have agreed to mark all sacks of high-grade potatoes marketed from the project with the word "Klamath."

PRICES offered for the apple crop on the Okanogan project are encouraging and growers with an average crop are anticipating good returns for their season's work. Warehousing concerns were busy getting their equipment and organization ready for work, which was expected to start the latter part of September.

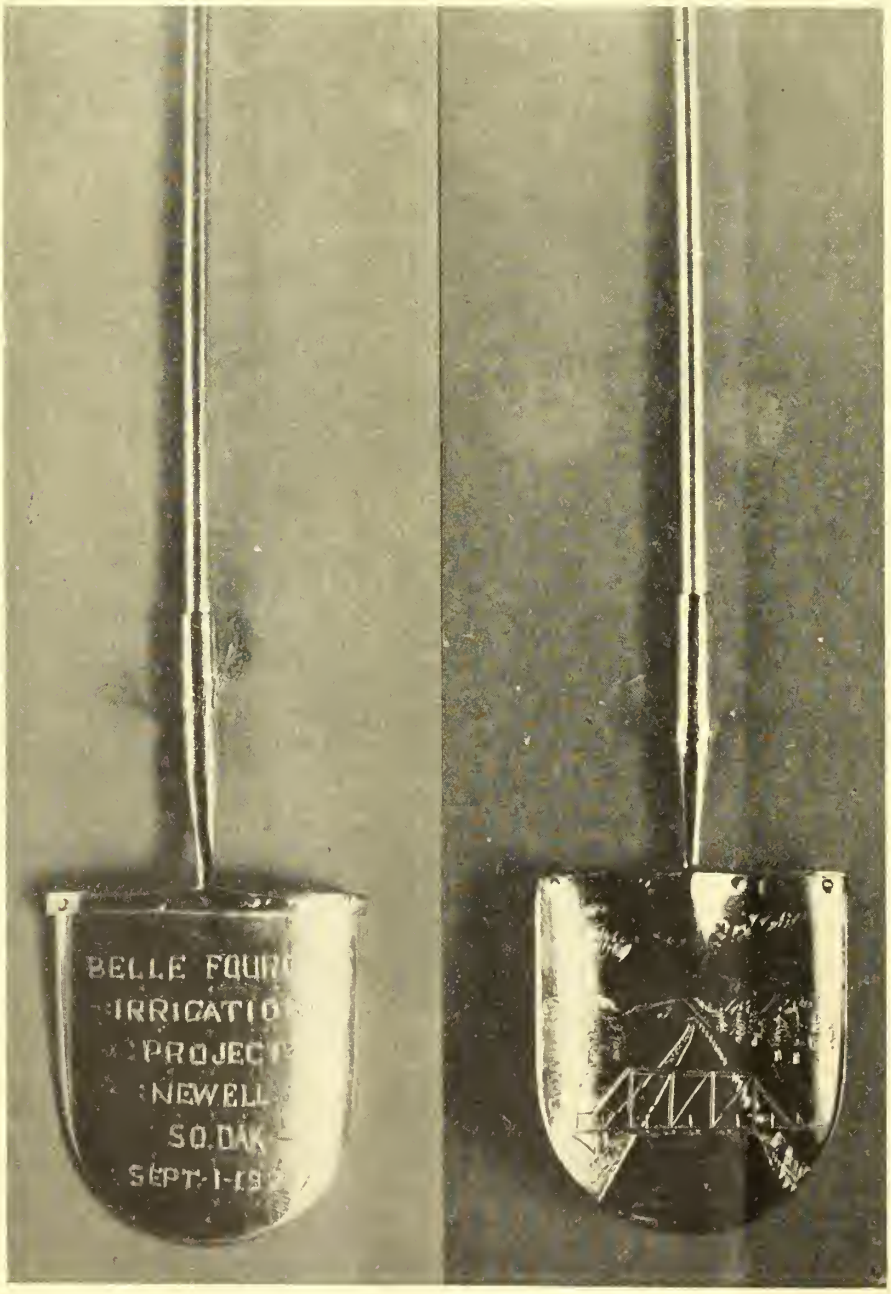
AN attempt is being made by San Diego capital to organize a cottonseed oil company for the manufacture and sale of cottonseed oil and cake, the plan being to issue blocks of stock to the cotton growers' associations in the Salt River, San Joaquin, and Yuma Valleys. This stock will be purchased at par and will be paid for out of profits, the cotton grower obtaining the regular market value for his seed in cash. The proceeds of the sale of the products, after deducting all expenses of operation and interest on preferred stocks, will be paid to the grower in the form of dividends, such dividends to be applied on this stock until the stock is paid for, after which the dividends will be paid in cash.

A REPRESENTATIVE of the Louisiana potato growers visited the Milk River project recently and obtained options on practically the entire seed potato crop at prices very satisfactory to the growers. The Potato Growers Association entertained representatives of the Louisiana University and the Great Northern Railroad during a tour of the potato fields.

President Coolidge Visits the Belle Fourche Project, S. Dak.

PRESIDENT Coolidge made a visit to the Belle Fourche irrigation project on September 1 to view the country included in this Federal enterprise and to observe the practice of applying water to growing crops. He was also a guest at the Butte County Fair, where the products of the project were displayed.

The President, accompanied by Mrs. Coolidge and the official party, journeyed by train from the summer White House in the Black Hills and arrived at Newell shortly after noon. A trip to the United States experimental farm and a short stop at the reclamation office were on the program for the day. A hearty welcome was extended the President and his party by Mr. W. D. Buchholz, secretary of the irrigation district, who acted as spokesman for the occasion and who invited the President to make his home in this valley upon retiring from office. A gift of 160 acres of irrigated land was offered as an inducement to enroll the President in the ancient fraternity of irrigators. As a token of esteem and a reminder of his trip to the project the President was presented with a miniature gold irrigation shovel, emblematic of the wealth to be dug from the soil of the fertile Belle Fourche Valley under the stimulating influence of irrigation.



Miniature irrigation shovel presented to President Coolidge on the Belle Fourche Project

Mr. Buchholz, in presenting the token, called attention to the development brought about by Federal reclamation wherein cooperation between the Government and a progressive people has transformed a grazing country into one of high production in specialized crops.

The shovel is engraved on the front with a canal scene showing water passing from the Belle Fourche River to the prairies, where it gives life and growth to the crops and vegetation of this irrigated region. On the back is inscribed the following:

Belle Fourche Irrigation Project
Newell, S. D., Sept. 1, 1927

"I accept this gift with pleasure, and I shall treasure it as a memento of my visit to your section," President Coolidge replied as he took the shovel. "I am much interested in reviewing progress of your irrigation project. A year or two ago we were not certain that it was going to be a success, but more recent experience has demonstrated it is a success. I am sure that it will contribute to the success of this region, and I am sure it will be able to sustain a large population and increase the productivity of the soil in this region."

The presidential party next visited the Butte County Fair at Nisland and had occasion to view the stock parade and the extensive exhibits of agricultural products and home economics displayed in the pavilion. (See back cover page.)

Charles M. Reid, member of the fair board, in a very appropriate talk, presented the President with a pair of blooded lambs that would serve to round out his suggested farming operations. The President responded smilingly and spoke of the generosity of the people of this section, who had presented him with enough equipment to become a full-fledged farmer of South Dakota.

"I am becoming very attached to the Black Hills," said the President. "Since I have been here I have been presented with a fine saddle horse and all of the accouterments. This afternoon I was promised that I would be made the possessor of a 160-acre farm in this fertile valley if I would return to live here, and

(Continued on page 147)

Economic Notes From the Irrigation Projects

Plans For Settlement, Belle Fourche Project, South Dakota [1]

By F. C. Youngblutt, Project Superintendent

IN presenting plans for settlement of the Belle Fourche project it is necessary to outline briefly the economic distress and agricultural difficulties that followed the deflation of 1920 and which finally became so pronounced that Congress considered abandonment of the project. The condition that confronted the Belle Fourche project no doubt to some extent existed on all our Federal projects, but was more aggravated on the Belle Fourche because the proportion of nonfarming settlers was greater than elsewhere and in the earlier years this seemed to be a fertile field for contention and animosity toward the Government, which left no precedent for cooperation to make the project a going concern.

The present activity should properly be termed "resettlement" because the public lands were all homesteaded previous to 1918 and have passed to private ownership. About 37,000 irrigable acres of public land were entered for the most part by people who had no foundation for an agricultural life and were particularly unsuited to the trials of irrigation farming, and who as a rule did not intend to become farmers. Business and professional men, clerks, school teachers, preachers, and plumbers all considered it genteel to own an irrigated ranch and although disappointments came early they nevertheless considered that speculative possibilities would more than balance the lack of profitable production. In 1921 by actual count there were 6,500 acres owned in the town of Newell by men engaged in occupations other than farming, to say nothing of similar holdings in other towns of the project and adjacent Black Hills cities.

For a number of years these holdings were sustained by reserve capital or money earned in other pursuits. They practiced some farming, either by proxy or by their own efforts and succeeded in getting a considerable area in alfalfa, but generally there was insufficient preparation of the ground, ditches were constructed in a haphazard manner, and too much land was left in the raw state. The war came on and with even a minimum of farming alfalfa sales at $25 a ton meant a big profit. Land prices were good and were going higher. Tracts which to-day we are offering at $30 to $50 per acre were selling at $75 to $125 per acre. Credit was liberal and a mortgage of $30 to $40 per acre enabled some to obtain an equity in another tract. These holders did not care to sell because each day brought better offers. Mortgage companies were inclined to extend their investment because the security appeared to be first class and interest could be turned into a higher principal. In this way an unhealthy credit situation was developed along with an unhealthy agriculture.

THE DEPRESSION OF 1920

The reaction which began in 1920 brought the collapse and demonstrated that a successful project must be founded on an agriculture which should be developed along with irrigation. Depreciated values wiped out equities and other farmers left the land because alfalfa was no longer worth the raising and city wages were good. Mortgage companies acquired numerous tracts which went out of production. Land that had been sold on small down payments went back to original owners who had already left the project. A large portion of the school land went back to the State through cancellation of purchase contracts. The project at no time had a sufficient number of farmers for intensive production and on top of this, in a few years of depression, 25 per cent of these disappeared. The established element of livestock farmers occupied 27 per cent of the farms and tenants 18 per cent, so that 55 per cent had no occupants.

Things drifted along through the lean years with the economic outlook and morale at low ebb. Taxes were neglected and the irrigation district collected practically nothing for water, although service continued under various relief plans. One hundred dollars payable at the end of the crop year would rent a good 80 in alfalfa, while the overhead charges, amounting to about $400, gave no one concern. Some farmers who were dispossessed remained and found they could rent their former holdings at less than general taxes. Through foreclosure and other adjustments ownership of the farms became scattered all over the United States from New York to Los Angeles, and from Florida to Minneapolis, and these owners, finding there was no sale at any price, gave little or no attention to their distant property. Investors in tax titles were not interested in this security which everyone appeared anxious to unload and which appeared destined for the scrap heap along with the project.

PLANS FOR REHABILITATION

This in brief brings us up to the fall of 1925, when rehabilitation plans were first considered. Fifty farms of the abandoned type were analyzed and we found the unpaid taxes and water charges averaged $15 and ran up as high as $25 per acre, with a mortgage in many instances that meant a total indebtedness of $50 per acre above the project construction cost. In this way tracts of land that were presented to the homesteader free of encumbrance with a productive soil and ample water supply in 10 years were consumed by overhead charges and unsound finance. After some study by the Reclamation Bureau it was at first proposed that the Government should acquire the nonproducing tracts and begin a community development under a plan founded on selected settlement and supervised agriculture. This had merit and seemed to fit the project needs but failed to materialize for lack of law.

The proposed abandonment of the project brought a stir from local organizations, and its friends got busy on means of saving their investment. A conference was called, participated in by Doctor Mead, Mr. Kreutzer, the railroad company, mortgage companies, local organizations, and others to discuss plans for making the enterprise a going concern. A very cooperative spirit was manifest

[1] Address at the Denver Conference, March 18, 1927.

President Coolidge on Belle Fourche Project

(Continued from page 146)

now I have been presented with two sheep. It happens that these presents round out just what I need to become a farmer in South Dakota. I already am the possessor of a herd of cattle, and with these additions I am fairly equipped to become a citizen representative of the Black Hills of South Dakota.

"This is another very fine exhibition of the splendid hospitality I have met here this summer, and, as I may not have another opportunity, I take this occasion to express to you the deep appreciation of myself and my family for all the hospitality and many tokens of affection that have been accorded us, and I assure you that we will take back to Washington a memory of a very pleasant vacation."

and a new program mapped out that has been well supported by the interested parties. The plans for rehabilitation included the following principal features:

A. Appraising and securing options on farms.

B. Settlement of the unoccupied farms.

C. Publicity for our agricultural advantages.

D. New industries to stimulate agriculture.

E. Drainage of the unproductive lands.

APPRAISALS AND OPTIONS

The appraising and option matter was handled largely by the project office. A committee visited the farms and fixed a value, and the owner was invited by correspondence or by a personal call to list the place on the standard option form which had been prepared. In cases where the appraisal was above the owner's price, the option was made out to agree with the lower figure. To illustrate this situation, we had one farm appraised at $4,400 which was listed at $1,000 because the nonresident owner was willing to take this amount. The place was one of the first to move. We obtained good cooperation from a great many of these nonresident holders, and particularly from the Scottish American Mortgage Co. These people had 25 farms on their hands which they listed at a considerable loss. In this way we obtained control of 95 farms, covering 6,500 irrigable acres, most of which can be bought on the basis of 10 per cent down and 20 years' time at 6 per cent, and the State owns about 4,000 acres more, which is considered part of the listings for resettlement. These places under option are not a large proportion of the project, but we think sufficient to control prices for several years.

The settlement and sale of these farms is to be handled by the economics department of the bureau. The man in charge is to be a part of the project organization, and it will be his duty to find the settlers, get them located in the right place, assist in handling tenants, direct the new farmers in their agriculture, purchase of stock, and equipment, supply information on methods and materials, and in general to provide an agency where farm problems will be given consideration. This activity will be extended to the project as a whole, and if a prospective settler is not suited with the farms under option, we propose to interest him in other places for sale, if his funds permit.

WIDESPREAD PUBLICITY

Publicity for the advantages offered is an important feature of settlement. To this end, the Government has published a booklet which deals with the farming opportunities on the project, gives the list of farms for sale under option, and includes descriptive details of all those features which a prospective settler seeks. The railroad company proposes to publish a similar booklet dealing with the same opportunities from slightly different angles. Locally we manage to get out articles and news items on crop and industrial developments, which the dailies copy in the section to our east, and in that way keep the project in the limelight. We have had very favorable write-ups in the Minneapolis, Denver, Chicago, and Kansas City papers, and the shorter news items appear frequently in the Sioux Falls and Sioux City dailies. The Belle Fourche Commercial Club has issued an illustrated folder which calls attention to the project by means of pictures, and the irrigation district also has published a leaflet, which is sent out in answer to the first inquiry. New industrial developments of any magnitude carry with them a natural publicity, which in our case has been very helpful in securing new beet farmers.

INDUSTRIAL DEVELOPMENT

About the time our economic situation began to improve along came the announcement of a sugar factory for the project and gave the entire rebuilding program a wonderful boost. The factory is largely the result of the untiring efforts of the Belle Fourche Commercial Club. They worked on this feature for 15 years, sending their emissaries to all parts of the country and finally landed the industry. The announcement immediately brought in beet men in such numbers that practically all our farms with a habitable set of buildings will have a resident operator next year. Inquiries are coming in from many parts of the country concerning opportunities on the project. More farms have been sold in the last few months than in six years before. The morale took a decided brace when it became apparent that new capital was willing to take a chance in the valley. The same farmers who only a year ago were back tracking have taken a new hold and are settling down to a real agricultural program. A sugar factory brings in many things besides beet raisers. This company already has four trained experts on the ground who are beginning to advise the farmers on rotations, about getting beet land ready, and to urge cleaning up, hauling manure, and where possible to plan their stock feeding and pulp handling next fall, and other things that go to stimulate production. These men have a fertile field in which to work, with prospects of changing some ragged farming to a very attractive agriculture, which our irrigated farms should present. The pickle industry on the project is to be expanded by erecting additional salting stations and a 12-mile railroad spur will tap the best beet area.

The rebuilding activities for the project include the important item of drainage. The Belle Fourche project has no drainage system and about 10,000 acres of land have already become unproductive. Through the recommendation of the commissioner, we have a million-dollar construction program approved that should reclaim the land and protect other areas from seepage.

PROBLEMS TO BE SOLVED

The progress of the program has uncovered a few problems that have not been solved. I refer principally to credit with which to improve the undeveloped farms. Most of the unoccupied tracts need buildings and some require extensive leveling and ditching. If Government aid for these features was available, as advocated by Doctor Mead, our settlement plans would be complete. As a youngster in southern Wisconsin I recall when the last of the hardwood forests were being cleared away to make room for agriculture. These pioneers from northern Europe had hewn away at the oak trees for 30 years and in that time had built real farms out of the Indian's hunting ground. They were content to clear a few acres a year and by thrift and industry they gained a competence along with a home and well developed farm. To-day if we brought a prospective settler to our irrigated farm and told him that the soil was good and water plentiful, but that to take off the sage brush, level, and develop the farm might take 25 years he would be off to the city, where pay day comes once a week. The pioneering spirit is a thing of the past and to place good farmers on our irrigated land requires that the proposition be attractive and must give promise of profit in a reasonable time. Settlement on the Belle Fourche project will gradually absorb the less desirable places, but the program will be under a handicap until we solve the matter of credit for improvements, livestock, and equipment, which are vital in making farms out of our project lands.

AN economic survey of the Montana irrigation projects is being made by the Montana State Agricultural College, under the supervision of Prof. M. L. Wilson.

South Dakota Irrigated Land In Demand

OTTO C. Batch, agent for the Department of the Interior on the Belle Fourche Federal irrigation project at Newell, S. Dak., reports up to the first week in September the sale of 14 project farms for $54,701. The total area of farms sold amounts to 1,785.5 acres at an average price of about $30 per acre. The farms sold vary from 40 acres to one of 480 acres, and the prices from $12.50 per acre to $54 per acre.

This activity in land settlement on the Belle Fourche project is being carried out cooperatively by the Federal Government, Belle Fourche Irrigation District, Chicago & North Western Railway Co., and the various chambers of commerce of the towns included in the project. The plan of land settlement put into effect late in 1926 provided that the farms offered for sale would be appraised by a board of independent appraisers who were familiar with soil and farm conditions in the district. Options were then taken by the Department of the Interior and at the appraised value and running to December 31, 1928. This insured that every settler who bought a farm on this project would get his money's worth. A uniform contract of purchase was worked out providing that settlers could obtain these farms for the payment of 10 per cent in cash at the time of purchase and the remainder in 20 years on the amortized plan with interest at 6 per cent. The plan has the advantage of offering to settlers irrigated farms at a very reasonable price and on terms that can be paid for out of their farm incomes.

The Belle Fourche project was constructed by the Federal Government at a cost of approximately $4,000,000, and includes 70,000 acres of irrigable land in the vicinity of Belle Fourche, Newell, and Nisland, S. Dak. It has long been known as a livestock center. Good crops of alfalfa, small grain, corn, and sugar beets are regularly produced. The water supply is provided from the Belle Fourche dam, which impounds 203,000 acre-feet of water. This is sufficient for a two years' supply. The water is carried from this reservoir in canals and delivered direct to each farm. The operating cost is one of the lowest of either private or Federal projects.

Along with this program of land settlement the project is being developed industrially. The Utah-Idaho Sugar Co. is completing the construction of a large beet-sugar factory at Belle Fourche in time to take care of the 1927 beet crop. This company estimates that 9,000 acres of sugar beets will be harvested this year with a yield of approximately 100,000 tons. On the project are a number of pickle-salting stations, the one at Nisland reputed to be the largest in the world. The Chicago & North Western Railway Co. is building a number of spurs through the project to transport beets from farms to factory.

Mr. Batch reports that five farms were sold during August and three farms during the first week of September. Inquiries and land seekers visiting the project are on the increase, which indicates that there will be considerable land sold during the fall and early next spring in readiness for the 1928 cropping season. Sufficient options have been secured to take care of a large number of settlers.

Settlement of the Tule Lake Division Klamath Project

ON March 1, 1927, the Secretary of the Interior opened to entry under public notice, 145 farm units ranging in size from 13 to 87 acres in the Tule Lake Division of the Klamath irrigation project, Oregon-California.

The land is a portion of the old bed of Tule Lake, which was unwatered through the construction of a diversion canal to take flood waters into Klamath River, and by the construction of Clear Lake and Gerber Reservoirs.

The land is fertile, of exceptionally smooth topography, and requires no clearing. Adjacent to the lake, on a large area which is not yet supplied with water, grain crops are being raised this year by lessees from the United States, yielding as high as 70 bushels of wheat and 100 bushels of barley per acre. This is an indication of the value of this land for farming purposes. These crops, however, were produced close to the edge of the lake where moisture conditions were favorable. As distances increase from the water's edge moisture must be supplied by irrigation.

On August 16, 1927, 138 of the farm units opened to entry in March, 1927, had been granted to applicants approved by the Board of Examiners as to industry, experience, character, and capital. The 7 remaining farms had been applied for by 10 applicants. Eighty-six of the applicants approved up to June 15, 1927, possessed an average capital of $5,600. Fifth-three of them were soldier entrymen. The smallest amount of capital possessed by any approved applicant was $2,200, and 8 applicants have more than $10,000. Of the 86 applicants 52 were from towns on the Klamath project. A considerable number will not change their address through securing these farms, which are adjacent to Malin, Oregon. Approximately 90 per cent of the applicants came from Oregon, Washington, and California. Many of these were aware of the attractive opportunity the Tule Lake land offers for farming and have waited for this opening. Considerable publicity was given to the opening by the Oregon State Chamber of Commerce, local newspapers on the Klamath project, and the Southern Pacific Railway Company. Very few of the applicants came from east of the Rocky Mountains.

None of the applications were approved and no filings were completed before May, 1927, but even at that late date a number of settlers were able to plow their land, level, construct head-ditches, and sow a crop of oats and alfalfa, which was making excellent growth. Seventy of the settlers were on the ground building houses, erecting fences, and carrying on other development work.

This good showing in rapid settlement can be summed up briefly as being due to the excellent opportunity offered farmers on the Tule Lake Division, namely, rich soil, level topography, public land, and reasonably priced water. No special agencies were at work to secure settlers, although all the agencies interested helped considerably.

CONFERENCES with mesa water users, the chamber of commerce, and business men regarding development and settlement on the Yuma Mesa evolved a plan involving the enactment of legislation providing that the Government level the land and construct the irrigation system on each individual tract, capitalizing these with the construction cost of the irrigation works and the cost of the land, the settler to pay at least 10 per cent in cash and the remainder to be repayable on an amortization basis in 20 years with a low rate of interest.

Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

What Is It All About?

Vegetable garden. The housewife's "charge"

HOW many of us go on day after day in a simple routine manner without ever stopping for a moment to figure out what it is all about. Are we working to exist, or for a goal?

The happy faces of care-free children on our projects, the wonderful schools built for them; roads, parks, and other evidences of civic pride show our project population is working for a goal.

The same pioneering spirit that dictated the establishment of their homes on sagebrush land urges them to give to posterity a better place to live than they settled on. Progress is the watchword and as long as there is something to work for, it is all done so willingly and with less effort.

Fixing a goal and planning methods of approach to it, in advance, is one way of eliminating the uncertainty of not getting what you want. Large enterprises have to be planned in advance; why not small ones? Everything you do can be worked out in this manner.

As the fall comes creeping on us there is a feeling akin to the "New Year's resolution season." The children have gone back to school and we start to figure out what the year's operations netted us, and experience will dictate a better way to lay plans for the coming year.

Now is a good time to start a budget. Count on getting all the things you want during the coming year. Aim high—you are liable to fall short.

Can't you feel the new life such planning instills in you? Employ your imagination.

Watch children at play and notice the real pleasure they get out of the simplest games. It is mainly because of their imaginations. They are not visionary; the things they do do not take on unreal or fanciful proportions; they are real material things to them.

Now is the time to plan on doing or getting the things you want. If this involves the expenditure of funds the housewife might be able to evolve some plan for an additional income during the year—the vegetable garden and the poultry yard are old standbys as sources of revenue.

Give your story to the ERA.

The following article about the Butte County fair and the visit of our President, Mrs. Coolidge, and John Coolidge, was graciously contributed by one of the women who has been associated with the fair since its inception in Butte County in 1921. She writes that she has seen it evolve from a few tents into good substantial buildings for the different departments.

Thriving on one of our projects

Our Butte County Fair

By Mrs. P. P. Vallery, Superintendent of Women's Department

The Women's Department is made up of Women's clubs of Butte County, and the individual exhibit, which is open to all, not only of our county but adjoining counties who wish to enter.

The clubs have three specials from which to select their exhibits. These specials comply with the classification of the individual exhibit and are judged with the same score cards.

Special No. 1.—Textiles and canned products. This carries prizes from $15 to $4.

Special No. 2.—Baked and canned products. The prizes are from $12 to $2.50.

Special No. 3.—Textiles. With prizes from $10 to $2.50.

One article from each class of the textiles and each article in every class of canned and baked products must be exhibited by the clubs that are entered.

Special attention is given to decoration of the booths and arrangement of articles exhibited. This year the clubs used the Denison crêpe paper in autumn colors for decoration and the effect was very fine. We plan to decorate in this way on a larger scale next year.

A very important part of our department is the baby show contest under the supervision of Mrs. Beyer Aune. Much interest is taken in this contest and many babies entered. It is not a clinic, but simply a contest of weight and measurement. The prizes range from $10 to $2.50.

We try to make a specialty of made-over garments and have had some very good work on exhibit.

Quilts and bedspreads have brought out very beautiful work and more interest is manifested in rugs each year.

If you could see the canned vegetables and fruits, the preserves and conserves, the jellies and pickles and the fine bread, cakes, and pies, you would realize that we have many good housewives and homemakers among us.

Everything displayed must be made within the year, that is from one fair to the next. The clubs at the first meeting after the fair select their special exhibit and are busy all the year filling the requirements of that special. Pickling and preserving for the next year are done immediately as our fair comes so early that many things are not matured and ready for use.

The clubs from the country always take the first prizes because they concentrate on the fair work throughout the year, and the town clubs have many diversions.

To many of our women this work is a great pleasure and incentive all the year. It gives an opportunity to compare work and exchange ideas. The whole object of the woman's department is educational.

To me the very best part is the hearty cooperation of all the women, each doing her part and more when necessary.

This year we were honored by having the President and Mrs. Coolidge with us for a short time on the afternoon of September 1. After being welcomed and viewing the parade and races they visited the women's department.

The pavilion where the exhibits are was cleared of all persons except one at each booth and Mrs. Beyer Aune and myself who stood at the open door to receive and show the presidential party through our department. Mrs. Aune took her place beside the President and I walked with Mrs. Coolidge. Little Betty St. Marea stood beside a flower-laden table near the door and as we passed presented Mrs. Coolidge with a bouquet from the women's department. A small bouquet tied with the club colors was also presented to Mrs. Coolidge by the lady in charge.

We hope for a still bigger and better fair next year.

Problems of Our Projects

The policy of banding together for more effective action is as old as the stone age. This principle in modern times gives vent to itself in cooperative organizations.

A short lead as to the benefits to be derived by the formation of such associations appears in the September issue.

In discussing activities of farm women with a group of ladies in the lower Rio Grande Valley it developed that a few years ago they decided to do their bit by raising chickens. The flocks increased, so did the egg supply but, one woman said, "What is the use, we have no market for them." The market exists but the organization to find it is not there.

In laying the foundation for a solvent cooperative organization remember that a large percentage of successes invariably attribute their success to the factors of "efficiency of the manager and the cooperation and loyalty of the association's members."

You people on the projects who have organizing ability call your neighbors together and talk it over. Several get-togethers might be necessary to outline your course of action, but as you go along individual problems will be brought up and will thrash themselves out, and when you are ready to organize, the main issues only will remain to be handled.

This is not a pioneering field and many precedents may be used as guides. Volumes have been written, for instance, on cooperative poultry and by-products associations set up in this country and abroad. These often relate obstacles met and conquered. This gives you the benefit of the experience of those who are now enjoying the marketing of their products through cooperative organizations.

I hope this will at least start you thinking about it.

Tree-lined highway. Make this one of your goals

Experimental Work on Small-Scale Models of Arch Dams

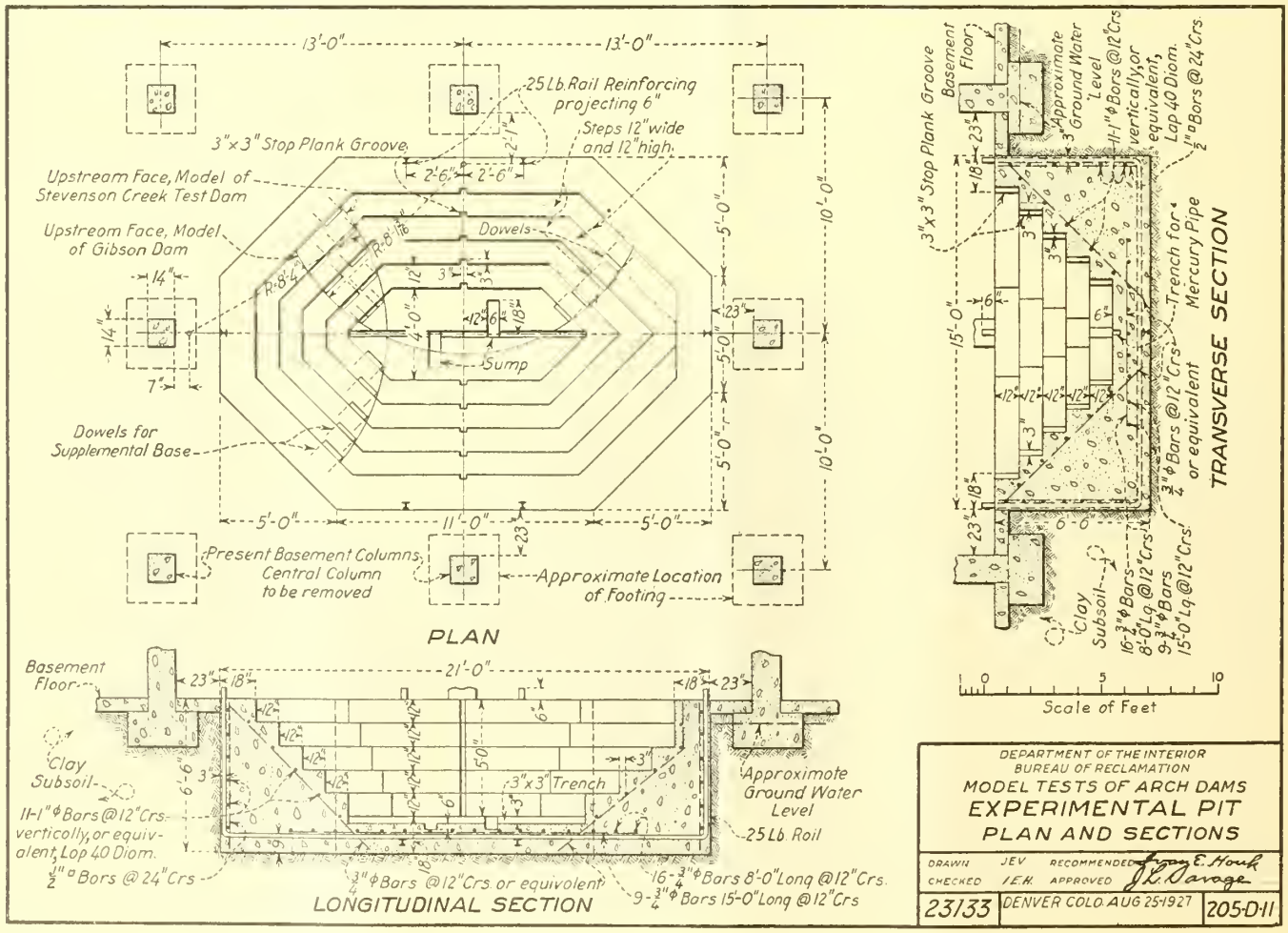
Miniature Dams, Loaded With Mercury, To Provide Data Needed For Design

By Ivan E. Houk, Research Engineer, Denver Office, Bureau of Reclamation

ONE of the most important secondary investigations being conducted by the Bureau of Reclamation at the present time is the experimental work on small-scale models of arch dams. It is expected that the investigations will furnish definite information as to the safety of arch dams already built or now being constructed by the Bureau of Reclamation, demonstrate the feasibility or infeasibility of using small-scale models in planning costly arch-dam structures, and provide the complicated technical data needed for comprehensive engineering studies of arch dams. It is anticipated that the experimental data obtained will make possible a more exact, and consequently a more economic, design of arch-dam structures, thus tending to permit the development of proposed irrigation, water power, and other engineering projects not heretofore considered financially feasible.

The model experiments are being carried on at Boulder, Colo., in cooperation with the University of Colorado and the Engineering Foundation Arch Dam Committee. In fact they may be said to constitute one part of the comprehensive research work being carried on by that committee. A subcommittee on model tests, appointed by chairman Charles D. Marx of the main committee, is cooperating with the representatives of the Bureau of Reclamation in outlining, supervising, and conducting the investigations. This subcommittee is composed of Chief Designing Engineer J. L. Savage, of the Bureau of Reclamation, chairman; Consulting Engineer D. C. Henny, of Portland, Oreg.; Consulting Engineer F. A. Noetzli, of Los Angeles, Calif.; Engineer-Physicist W. A. Slater, of the Bureau of Standards; Prof. Raymond E. Davis, of the University of California; Prof. George E. Beggs, of Princeton University; Profs. F. R. Dungan, C. L. Eckel, and H. J. Gilkey, of the University of Colorado; Engineer Julian Hinds, of the J. G. White Co. of Mexico, formerly of the Bureau of Reclamation; and the writer.

The experiments will be made in the basement of the testing laboratory at Boulder, where the testing equipment, instruments, and other experimental apparatus of the university will be available for the use of the testing staff. An experimental concrete pit, with massive, heavily reinforced sidewalls and floor, has been built below the floor of the basement to serve as a site for the model dams. The pit has a depth of 5 feet, a maximum inside length of 18 feet, and a maximum inside width of 12 feet. One of the accompanying illustrations shows the plan of the pit, a longitudinal cross section along the center line, and a transverse cross section through the center. The octagonal, stepped design



ill permit the testing of models of ractically any shape, symmetrical or onsymmetrical, and of practically any ze not exceeding the maximum inside imensions of the pit.

MODELS OF DIFFERENT MATERIALS

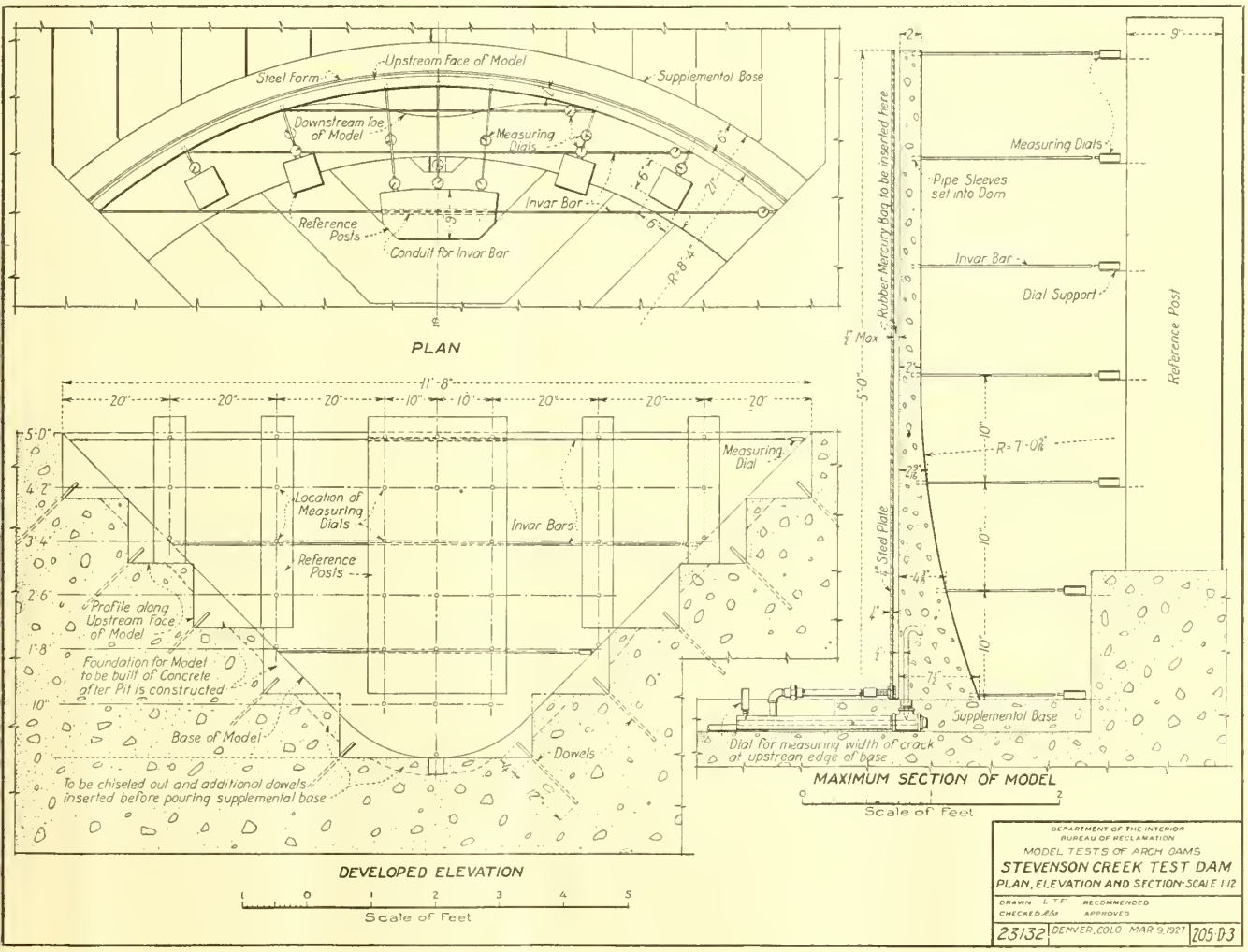
Careful study has been given to the ossibility of using different materials in uilding the models. Hard rubber, elluloid, plasticine, gypsum, cast-iron locks, and other materials have been onsidered as possible substitutes for oncrete, the material now invariably sed in the construction of full-size dams. ery careful study has also been given to ifferent methods of loading the models, ich as loading by springs, by mercury, y water, by water pressure transmitted hrough inclosed horizontal lengths of ubber hose laid along the upstream face f the model, etc. The conclusions eached were that the first models should e built of concrete, that they should be ested under triangular loads obtained y holding a film of mercury against the pstream face of the model, and that xperiments with other materials and other methods of loading should be deferred until the results of the first tests are available.

The first experiment to be conducted will be an investigation of a $\frac{1}{12}$-scale model of the Stevenson Creek Test Dam, the 60-foot symmetrical arch dam which was built by the Engineering Foundation Arch Dam Committee for the purpose of studying the action of arch dams. The model will be 5 feet high, 11 feet 8 inches long, 2 inches thick at the top, 7½ inches thick at the bottom, and curved on a radius of 8 feet 4 inches. It will have the same V-shape as the Stevenson Creek Test Dam and will be built in one end of the pit where the arch elements can abut against the side walls at an angle of approximately 90 degrees. A plan, elevation, and vertical cross section of the model at the location of maximum height are shown in one of the accompanying drawings. Arrangements are being made for a shipment of fine aggregate from the Stevenson Creek site to Boulder, for use in building the model, so that the concrete in the model will be very nearly identical with that used in the actual dam.

LOADS AND MEASUREMENTS

Loads on the model will be obtained by forcing mercury into a rubber bag held against the upstream face of the model. The rubber bag will be held in place by a ¼-inch sheet steel form, curved to the same radius as the upstream face. Heavy timber bracing will hold the form in position, and air pressure will be used to force the mercury from the supply tank into the rubber bag. Since mercury is 13.6 times as dense as water, a dam 5 feet high, loaded with mercury, will be subjected to the same pressure at the bottom as a 68-foot dam loaded with water.

Very careful measurements will be made of the movements of the model when the load is applied. Deflections of the down stream face will be observed at approximately 40 points, by means of dials reading directly to one ten-thousandth of an inch. Invar steel rods, whose lengths do not change with variations in temperature, will transmit the movements of the downstream face to the measuring dials, the rods being arranged as shown in the accompanying plans. The movement of the



model at the upstream edge of the base will be measured at the crown section where the formation of a crack is anticipated. Movements of the abutments will be observed at three elevations corresponding to the elevations at which similar measurements were made at the Stevenson Creek Test Dam. Strains at the downstream face of the model will be measured with the optical strain gage developed by Doctor Tuckerman, of the United States Bureau of Standards. Repeated observations with this instrument, made by different persons, have demonstrated its ability to measure strains in a 2-inch gage length with an accuracy of one four-millionth of an inch. Investigations are being made to determine the feasibility of using this instrument in measuring other deformations of the model, such as changes in length of mid-ordinates in a 10-inch chord length, angular rotation of different elements of the model, deflections near the base of the model, etc.

The decision to build a model of the Stevenson Creek Test Dam for the first experiments was based on the fact that complete data regarding deflections, strains, bending, movement of abutments, temperature effects, etc., are available for that structure, the first series of experiments by the Arch Dam Committee having been completed and the data now being practically ready for publication. It is expected that a comparison of the experimental data obtained on the model with that obtained on the actual dam will determine the relations between a small-scale concrete model loaded with mercury and a full size structure loaded with water. These relations can then be used in interpreting the results of subsequent model tests. They will also be of value in deciding whether it is advisable to conduct experiments on models built of other materials.

DETERMINATION OF LOAD DISTRIBUTION

The action of arch dams is a complicated problem, more complicated than the action of arch bridges, because of the fact that arch dams are restrained along the irregular profiles of the foundations and abutments instead of along two parallel sections as in the case of arch bridges. The assumption usually made in the design of arch dams is that part of the horizontal water load is carried by vertical cantilever action, and the remaining part by horizontal arch action, the distribution of loads being based on the criterion that the deflection of the arch elements must equal the deflection of the cantilever elements at corresponding points. The usual procedure in determining the load distribution has been to bring the arch and cantilever deflections together at the crown section of the dam, and then to assume that, for such a distribution, an equally satisfactory agreement of deflections exists at other parts of the structure. During the last few years the Bureau of Reclamation, in preparing designs for costly arch dams, has been continuing the mathematical studies until the arch and cantilever deflections are in agreement entirely around the dam, at from 6 to 10 different elevations and from 10 to 20 vertical cross sections. If the entire water load can be accounted for by the arch and cantilever elements, without producing excessive stresses, suitable allowances being made for temperature variations, the structure is considered safe. If not, the design must be modified until the excessive stresses are reduced to allowable limits.

The accuracy of the fundamental assumptions made in the design of arch dams, the effect of variations in shape of cross section on the load distribution, the effect of restraint along the irregular profile of the foundation and abutments on the mathematical formulas used in the design, the effect of movements of bedrock, flow of concrete, temperature variations in the body of the dam, etc., can not be satisfactorily determined by mathematical investigation. It is not known that they can be satisfactorily determined from a study of the action of models. The ideal solution would be an elaborate system of measurements, such as was made at the Stevenson Creek Test Dam, on several full size dams of different design, built in canyons having different shapes of cross section and different rock formations. Such an ideal solution is not practicable because of the excessive cost involved. However, it is believed that an adequate solution can be obtained through a careful study of the action of small-scale models in conjunction with suitable mathematical treatment, the comprehensive Stevenson Creek Test Dam data, and such experimental observations as it is practicable to secure on other full-size dams.

USE IN BOULDER CANYON DAM DESIGN

When the experiments on the Stevenson Creek Test Dam model are completed it is proposed to investigate the action of a model of the Gibson Dam now being built on the Sun River project of Montana. Since the valley at the Gibson site has a relatively wide cross section, definitely different from the narrow V-shaped section at the Stevenson Creek site, it is expected that a definitely different load distribution will be found. Computations made in designing the Gibson Dam indicate that approximately three-fourths of the load will be carried by gravity (cantilever) action, whereas, in the case of the Stevenson Creek Test Dam the greater part of the load was carried by arch action.

It is anticipated that the technical data obtained in the experiments with the Stevenson Creek Test Dam and Gibson Dam models will furnish a basis for the utilization of arch elements in designing the Boulder Canyon Dam. It is also expected that such utilization of arch principles in the Boulder Canyon design will result in a comparatively great saving in cost over the tentative gravity designs made in the past. The experience gained in testing the Stevenson Creek and Gibson Dam models should also indicate the proper procedure to follow in building and testing a model of the proposed Boulder Canyon Dam. Doubtless many special problems, which can not now be foreseen, will arise during the prosecution of the work. It is hoped that they all may be satisfactorily solved.

The institution of a comprehensive research program is always the most critical period. Many worthy investigations have been seriously handicapped by getting started in the wrong direction. Although an actual model test has not thus far been made it is felt that definite progress in the right direction has been achieved in spite of the various delays that have been necessary. Plans for the tests have been thoroughly worked out, an experimental pit has been built, a supply of mercury has been obtained, the steel form for the upstream face of the Stevenson Creek Test Dam model has been purchased, advertisement for bids on instruments has been issued, and various miscellaneous supplies have been acquired. It is hoped that the first model dam can be constructed in the near future and that the experimental data obtained will come up to our expectations.

Start Potato Harvest on Minidoka Project

With approximately 10 cars shipped from each side of Snake River, the potato season opened recently on the Minidoka project, Idaho. Shipments were to Chicago and the southeast. As is the case with all crops on the project, potatoes started out with a promise of both quality and yield above the average. The total tonnage was estimated in some quarters at 40 per cent greater than that of last year. Prices at the beginning of shipments were around 95 cents sacked, delivered at the cars.

Proposed Contract between the United States and American Falls Reservoir, District No. 2, for the Construction of the Gravity Extension Unit of the Minidoka Project

NEAR Gooding, Idaho, there is a large body of land that has been irrigated for a number of years from the Big Wood and Little Wood Rivers. The water supply is entirely inadequate for the irrigation of the land, even when reinforced by stored water from Magic Reservoir which has been constructed to supplement the natural flow of the two rivers.

By the act of January 12, 1927, 44 Stat. 934, Congress came to the rescue by appropriating $400,000 for "investigation and construction of the gravity extension unit" of the Minidoka project, the appropriation act containing the following proviso: "*Provided*, That none of the said sum of $400,000 shall be available for construction until a contract or contracts shall be made with an irrigation district or districts embracing said unit, which, in addition to other conditions required by law, shall require repayment of construction costs as to such lands as may be furnished supplemental water, within a period not exceeding twenty years from the date water shall be available for delivery."

Investigations which have been made by the Government show that this land can be irrigated by the construction of a canal approximately 70 miles long, taking out from the Snake River above Milner Dam. The canal will approximately bisect the area that had been irrigated from the Wood Rivers and leave about one-half of the old irrigated lands dependent solely upon the Wood River supply, the remaining one-half of the old lands being susceptible of irrigation by gravity from the proposed Government canal. The plan is to concentrate the entire available Wood River supply upon the old lands above the Government canal. The construction of the Government canal will permit the irrigation of a large area of new land, now in Government ownership.

Milner Dam, referred to above, is owned by private parties and operated as the diversion dam for the irrigation of large tracts of land not under a Government project. The proposed Government canal will divert from the backwater above Milner Dam. The Government water supply for the Gooding lands will be obtained from water stored in the Government reservoir at American Falls, a considerable distance upstream from Milner. The State laws give the right to utilize the river for the carriage of stored water, and the diversion of such water supply above Milner Dam will in no way affect the use of the dam by its owners for the diversion of their water supply.

If the owners of Milner Dam should make a claim for compensation for the use of their dam, the matter seems to be one for the district to handle, and article 21 of the proposed contract with the irrigation district embracing the land of the Gravity Extension Unit reads as follows: "The district agrees to assume and pay, and herein and hereby now assumes and agrees to pay, all obligations and claims of every kind, nature, and description, if any, which may arise and accrue in favor of any or all the legal or equitable owners of the Milner Dam by reason of the diversion of [water through the [main canal as herein provided, and to keep the United States harmless therefrom."

A part of the area of the old irrigated land is held in large ownerships, and under the reclamation laws the United States is unable to furnish water for the irrigation of more than 160 acres of privately owned land in the ownership of a single person. The contract therefore provides a method for the breaking up of such large ownerships into smaller holdings that may be irrigated under the Federal reclamation laws. The land is to be appraised, and a copy of the appraisal is to be attached to the irrigation district contract when executed. The large landowners are to execute individual contracts by which they agree to dispose of the excess area for sums within the appraised valuations, the excess areas to be so disposed of within three years after water from the Minidoka project is first delivered to the Gravity Extension Unit. If the landowner fails to so dispose of his land within this three-year period the Secretary of the Interior is empowered to sell the excess land for the best price obtainable, and in tracts irrigable under a Federal reclamation project. The United States is not to be obligated to make any expenditures toward the construction of the Gravity Extension Unit of the Minidoka project until at least 75 per cent of the area of the irrigable excess land of the said unit is covered by recordable contracts binding the owners thereof to convey the same at the maximum prices fixed in an appraisal approved by the Secretary.

The contract also provides for the appraisal of the new land of the project, without regard to any enhancement of value due to the proposed construction. In case of sales at prices in excess of the appraised valuation, one-half of the excess is to be paid upon the charges for the Government water right for the tract so sold. Thus a speculative enhancement of the value of the land will hasten the time when the project charges are paid.

By the terms of the proposed contract the United States is to expend a maximum of $5,200,000 for the construction of the main canal referred to above, laterals, structures, and drains, and the district is to pay to the United States a maximum of $2,500,000 for storage rights in American Falls Reservoir, already built. The district is to receive a four-seventeenths share in the reservoir, estimated to be equivalent to 400,000 acre-feet of storage capacity. The "old" landowners are to pay their construction charges within 20 years, as required by the act of Congress quoted near the beginning of this article, and the owners of "new" land are to be permitted to make payment of their construction charges within 40 years, this being allowed under the act of Congress of May 25, 1926.

The "old" land has largely been irrigated under canals operated by the Big Wood Canal Co. and this company is to continue such operation after the Government project is completed. Provision is made for a contract between the company and the district to this end.

The form of contract referred to in this article was approved by the Interior Department on September 9, 1927, and the district has called an election to ascertain if the contract will be adopted by the landowners.

Seven State Governors Discuss Colorado River

From August 22 to September 1, the governors of the seven Colorado River basin States, together with their advisers, were in attendance at a conference at Denver for the purpose of arranging an agreement between the three lower basin States for the allocation of water and power resources proposed to be set aside for those States by the Colorado River compact. For a few days prior and subsequent to the official session official meetings were also held. No agreement was reached and the conference was adjourned to meet again at Denver on September 19, when this issue of the NEW RECLAMATION ERA went to press.

Transfer of Equipment and Supplies on the Reclamation Projects[1]

By S. O. Harper, General Superintendent of Construction

DURING the past two or three years the situation relative to the plant and equipment on most of the projects of the Bureau of Reclamation has radically changed. The principal reasons for this change are the completion of the major program of drainage construction on many of the projects, the policy recently adopted of contracting all large construction work instead of carrying it on by Government forces, and the turning over of a number of the projects to the water users for operation. These conditions have greatly reduced the requirement for new plant and equipment, calling for a policy of liquidation rather than expansion, and making it advisable to supply requirements for new items by transfer wherever possible, instead of through purchase.

In furtherance of this policy a system has been adopted in the Denver office for a thorough comparison of all requests for purchases of new equipment or supplies with the list of articles available for transfer, in order that no opportunity to supply requirements by transfer may be overlooked.

Project purchase requests received in the Denver office are first routed to the chief clerk, who passes them on to the property clerk for comparison with the available transfer lists. If the requirement can be filled by transfer, action is taken accordingly. If no suitable articles are available for transfer, this information is noted on the purchase request with a stamp, and it is then passed on to the general superintendent of construction for approval. If the purchase appears proper and the articles desired are necessary in connection with the operations of the project, the purchase is approved and the papers are routed to the purchasing department for appropriate action.

If there is nothing listed in the equipment catalogue or records in this office indicating that the requirements can be met by transfer, but at the same time there is reason to believe that some of the articles—particularly materials and supplies of which there is no record in this office—are available on certain of the projects, the purchase request is approved for advertisement by the purchasing department, with instructions not to place the order until finally cleared after circularization of the projects which may be able to supply the articles in question. The advertisement is issued in the regular way, but when bids are opened replies from the projects are at hand, and the purchase order is placed for only those items that are not available for transfer.

THE EQUIPMENT CATALOGUE

The equipment catalogue is intended to keep the projects advised of the principal items of equipment available for transfer. It is not possible, however, to keep this catalogue absolutely up to date, and there are also many items of equipment which may be made available for transfer from time to time which are not listed in the catalogue. The projects should therefore not reach the conclusion that because a certain article is not listed in the catalogue it can not be supplied by transfer, and it is important that no steps be taken by the projects to purchase equipment or supplies, except in the case of emergency, without submitting a statement of the requirements or a purchase request to the Denver office.

By far the largest investment of the bureau in one class of equipment is in drag-line excavators. Last spring, before any equipment was turned over to the water users, the bureau owned 71 drag-line excavators, with an appraised value of $475,000, and which originally cost $1,390,000. In view of the fact that many of these machines were idle, with no further work in prospect, a particular effort has been made during the past year to dispose of them where possible and also to fill all requirements for repair parts by transfer. The market for second-hand drag lines, however, has not been favorable, and, owing to the fact that new machines have been greatly improved and also lowered in price, it is very difficult to dispose of our second-hand drag lines at prices which will return the book value.

During the past year only two drag lines have been sold, though sales have also been made of three large electric shovels at McKay Dam and Yakima, and 14 drag-line excavators of various sizes have been transferred to the water users on projects where the operation has been turned over. At this time the bureau owns 55 drag-line excavators, about 40 of which are in more or less regular use. Some of the older drag lines are obsolete, and there is little or no chance to realize any material return through their sale. The only safe procedure is to see that these machines are depreciated entirely to the work before operations are suspended.

FIXING THE TRANSFER PRICE

The most prolific sources of misunderstanding in connection with the transfer of equipment and supplies is the fixing of the transfer price. This office must depend upon statements furnished by the project superintendents of the condition of the equipment, and unless these statements are accurate transfers will sometimes be ordered of articles which are not worth the freight. Inequalities in transfer prices can of course be settled by this office, and if an article is not as represented the project transferring it is expected to stand the cost of putting it in condition or to reduce the transfer price to a fair value. If the article transferred proves unsuitable, or if the transfer price appears unreasonable, do not ship it back, as has been done in one or two cases, but refer the case to the Denver office, and proper adjustment in the price will be made.

Every precaution is taken to avoid transfer of equipment or supplies which are not worth the transportation charges, and in order to control this situation as closely as possible a form has been prepared for use in this office, on which the following information is shown in connection with all transfers: Estimated current market price of article if purchased new; freight from purchase point to destination; and total cost f. o. b. destination. Below this is shown the estimated freight from the transfer point to destination, the maximum permissible transfer value, which, in the case of new articles, is based on the cost of similar articles f. o. b. project if purchased in the open market, and the original cost to the issuing project. In the case of new articles of equipment or supplies, transfer will not ordinarily be approved at a price which will return the transferring project less than 75 per cent of the original cost, especially where the articles are standard and can be sold locally. In the case of used equipment this limit, of course, does not hold, as the transfer price should be fixed on the value of the equipment to the receiving project, taking into consideration its condition and the service it has given.

The general principle followed in connection with fixing transfer prices is that the transferring project shall absorb the freight and sufficient depreciation so that the receiving project shall not pay more than the current market price. If this results in a lower return to the transfer-

[1] Address at the Denver Conference, March 18, 1927.

ring project than could be obtained by sale in the local market, transfer should not be made.

HOW THE ACCOUNT STANDS

At the beginning of the calendar year 1926 the total balance in plant and equipment accounts on all projects was $1,564,184. This was reduced during the year by depreciation charges in the amount of $155,892, by sales amounting to $89,245, and by transfers to the water users of property valued at $80,152, leaving a balance at the end of the year of $1,228,895. Excluding the Riverton project, which accounts for $537,212 of this amount, the plant and equipment accounts on practically all of the other projects are now in healthy condition, the balance having been reduced from $995,359 to $691,683. Inventory accounts are also generally in good condition, the total having been reduced during the year from $729,886 to $553,335.

The total transfers between projects during the calendar year 1926 amounted to $37,654. It is estimated that the cost of transferred articles if purchased new would amount to about $85,000. The total sales effected during the year amounted to $89,245.

A number of problems have arisen in connection with the turning over of equipment and supplies to the water users on the various projects where the operation and maintenance has been transferred. The first contracts executed for the transfer of project works provided that lists of all equipment and supplies, with the book value of each item, should be furnished the water users, and from this list they were permitted to select such articles as they desired, the balance remaining the property of the Government. Manifestly, this was not a desirable procedure, as it might leave on the hands of the Government, without definite provision for securing repayment, such property as the water users did not desire to take.

In order to avoid loss to the reclamation fund, steps were taken to reduce the book value of all property on those projects where this condition held in order that there would be no question that the equipment retained by the Government could be sold at a sufficient price to return the investment. In view of the conservative values fixed for the property on the projects in question, the water users in nearly all cases have elected to take over the entire list, evidently with the idea that the payment for the property is spread over a long period of years, and the property when in the hands of the district has an immediate cash value, which the districts can realize by selling such articles as they do not need.

PROTECTING THE GOVERNMENT'S INTERESTS

In the later contracts the provisions covering transfer of equipment have been modified so as to compel the water users to either take over all equipment at the book value or to assume the shrinkage between the book value and the sale price of any equipment which is retained and later disposed of by the bureau. This procedure protects the interests of the Government and at the same time avoids the necessity for reducing the appraised value of the equipment to an unreasonably low figure to insure that the water users will take it. On projects where the water users are taking over the operation of a part of the system, but the bureau continues to operate and maintain reserved works, particular care should be taken not to transfer any equipment or supplies to the water users which will have to be replaced by purchase in the future.

The principal points which I wish to emphasize in connection with property on the projects is the necessity for keeping the plant and equipment as well as the inventory accounts in healthy condition by disposing of all surplus property whenever opportunity arises. If equipment is on hand for which it is certain there will be no further use, the sooner it is disposed of the better. It almost invariably happens that the longer an article is held the less return will be realized from its sale, as it not only depreciates in value from year to year by the action of the elements, but in the case of much of our equipment it also rapidly becomes obsolete. In view of the decline in construction activities by Government forces, it is the policy of this office to accept any reasonable offer for surplus second-hand equipment, even though it will bring much less than it would if transferred between projects.

Oldest Standing Cabin In The Yakima Valley

The accompanying illustration, from a photograph sent to the Washington office by Superintendent Lytel of the Yakima project, Washington, shows the oldest standing building in the Yakima Valley, located on what is now known as the Sawyer ranch on the Sunnyside division of the project.

From the best information obtainable, the cabin was built in 1864 by a settler named J. P. Mattoon, the land on which it is standing being homesteaded at that time by Mr. Mattoon. The cabin is constructed of cottonwood logs, chinked with native clay.

The locality in which the cabin is built was known originally as Parker Bottom, a rather interesting spot historically, as one William Moore built there in 1847 the first house constructed by white men west of the Columbia River and east of the Cascade Mountains, in the State of Washington. This house was built within a few feet of the present cabin, but nothing remains of it to-day except an old wooden anvil block. In 1849 a Catholic mission was also built within a few hundred feet of the cabin.

The land on which the cabin stands is owned by Mr. W. P. Sawyer, who acquired it in 1890 and built himself a very fine modern, up-to-date residence on the site of the old mission house.

Oldest cabin in the Yakima Valley, Washington

The McKay Creek Bird Refuge, Umatilla Project, Oregon

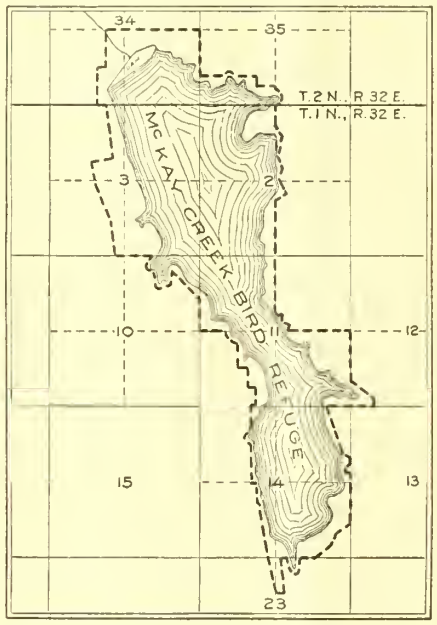
By E. A. Goldman, in charge, Game and Bird Reservations, Bureau of Biological Survey, U. S. Department of Agriculture

THE McKay Creek Bird Refuge, created by Executive order June 7, 1927, embraces the McKay Reservoir, and a narrow strip of surrounding land located about 5 miles from Pendleton in northeastern Oregon. The great dam constructed by the Bureau of Reclamation, and forming the reservoir, is 160 feet high and 2,600 feet long. Behind its massive bulk is storage capacity for 75,000 acre-feet of water, which will bring fertility to a large territory and under protection a host of water-loving birds will be benefited.

The refuge as a whole contains 1,813 acres in an unusually favorable setting, as it is surrounded by an extensive wheat-growing section, in a region with few water areas attractive to wild fowl. Ducks, geese, and other waterfowl can not thrive either on water or food alone, but the two in convenient combination are irresistible. Fall rains filling small depressions in and about stubble fields will make them ideal feeding grounds for ducks and geese which can resort to the refuge for protection. Where reservoirs for the storage of irrigation water have precipitous shores, or are surrounded by broad belts of sterile land, their value to waterfowl is comparatively limited, but it is believed that the McKay Creek Bird Refuge will be worthy of the name.

It is hoped that conditions may here favor the breeding of a considerable number of birds, but no storage reservoir with wide fluctuations in water level and rapidly changing depths tending to prevent the growth of aquatic plants furnishing food can be as attractive to breeding waterfowl as a permanent marsh or shallow water area with a more nearly stabilized depth.

The great value of the refuge seems likely to be as a resting ground for very large numbers of geese and ducks that finding sufficient water may, with protection, remain to feed in the surrounding grainfields throughout much of the fall, winter, and spring seasons. During the open season for hunting from October 1 to January 15 great numbers of geese, mallards, pintails, and other ducks attracted to the general section should afford excellent sport in passing from the reservation to the feeding grounds. Without the protection of the refuge, however, the visiting migrant would soon be forced to resume their flight in search of a congenial wintering place. Oregon sportsmen have shown their appreciation of the importance of affording a safe resting place for migratory wild fowl by favoring the establishment of the refuge.



The Executive order creating the refuge is as follows:

It is hereby ordered that parts of secs. 2, 3, 10, 11, 12, 14, and 23, T. 1 N., R. 32 E., and of secs. 34 and 35, T. 2 N., R. 32 E., W. M., Oregon, as segregated by the broken line upon the diagram hereto attached and made a part of this order, be and the same are hereby reserved and set apart for the use of the Department of Agriculture, as a refuge and breeding ground for birds.

All of the lands involved have been purchased, or will be purchased, for reclamation purposes in connection with the Umatilla Project, Oregon, and are primarily under the jurisdiction of the Department of the Interior. The reservation of these lands as a bird refuge is subject to the use thereof by said Department, including leasing for grazing, and to any other valid existing rights.

It is unlawful for any person to hunt, trap, capture, wilfully disturb or kill any bird of any kind whatever or take the eggs of such birds within the limits of this reservation, except under such rules and regulations as may be prescribed by the Secretary of Agriculture. Warning is expressly given to all persons not to commit any of the acts herein enumerated under the penalties provided by section 84, U. S. Criminal Code, approved March 4, 1909 (35 Stat. 1088), as amended by the act approved April 15, 1924 (43 Stat. 98).

This reservation shall be known as the McKay Creek Bird Refuge.

President Coolidge Gets Shoshone Honey

Mr. Val Kuska, colonization agent of the Chicago, Burlington & Quincy Railroad Co., has sent us a letter from F. G. Gurley, general superintendent of the railroad at Alliance, Nebr., stating that at the time of the recent visit of the President and Mrs. Coolidge to Yellowstone National Park, the water users at Powell on the Shoshone project, Wyoming, put several 10-pound pails of strained honey on the President's train and also distributed cards reading as follows:

POWELL
The Center of Wyoming's Garden Spot
on the Shoshone
Reclamation Project
Built by Uncle Sam

There was produced and shipped from this division of the project, comprising 32,000 acres, in 1926, the following:

Sugar beets (carloads)	*529*
Alfalfa meal (carloads)	*414*
Baled hay (carloads)	*1,081*
Potatoes (carloads)	*256*
Dried beans (carloads)	*18*
Honey (carloads)	*4*
Dressed turkeys (carloads)	*5*
Butter (pounds)	*162,000*
Ice cream (gallons)	*8,000*
Dressed chickens	*25,000*
And enough other agricultural products and stock to make a total shipment of (carloads)	*2,629*

Million Dollar Crop For Tieton Orchardists

A recent issue of the Yakima Morning Herald states that growers and packers in the Tieton-Cowiche district, which covers about 2,500 acres of apple orchards between and around the towns of Tieton and Cowiche on the Tieton division of the Yakima project, Washington, are making preparations for handling a million-dollar apple crop. Conservative estimates place the total pack of the district at 1,000 carloads of 756,000 boxes. Allowing an average of $1.50 a box, the million-dollar mark for the crop will easily be reached.

In this section of the Yakima Valley the apple crop will exceed that of last year by 10 to 20 per cent. The crop will be handled at seven packing houses: The Horticultural Union, Tieton Fruit Growers, Cowling & Young, and the Cowiche Cold Storage Co. at Tieton; and C. M. Holtzinger, Cowiche Fruit Growers, and the Big Y at Cowiche.

With a short apple crop this year throughout the country, affairs look rather auspicious for a top market for this product of the Yakima project.

Organization Activities and Project Visitors

THE President and Mrs. Coolidge paid a visit to the Belle Fourche project, S. Dak., on September 1. This is the first Federal irrigation project which has enjoyed the honor of a visit by President Coolidge, an account of which will be found on another page.

Secretary Work, accompanied by Governor Fisher, of Pennsylvania, was a recent visitor to the Belle Fourche project. According to reports from the project the Secretary was pleased with his inspection of the economic and agricultural situation and with the new industrial development. He appeared particularly pleased with the financial feature which showed that all assessments due the Government have been paid.

Dr. Elwood Mead, Commissioner of Reclamation, who left for Palestine on August 1 for a study of and report on the reclamation and settlement work in that country under the Zionist Organization, left Jerusalem on September 12 and expects to arrive at Boston on the *President Adams* on October 4.

Word was received by the Washington office on August 31 of the sudden death on that date, on the Uintah Indian Reservation, Utah, of Ray P. Teele, of the Bureau of Agricultural Economics, Department of Agriculture. At the time of his death Mr. Teele was engaged with Porter J. Preston, superintendent of the Yuma project, and Charles A. Engle, of the Bureau of Indian Affairs, on an engineering and economic survey of the reclamation projects.

Maurice J. Ricker, photographer in the Washington office, was in the South during the first three weeks of August taking motion and still pictures on the projects selected by the States of South Carolina, Georgia, Alabama, Mississippi, and Tennessee for a study of opportunities for planned group settlement. He left the Washington office on August 24 to join Mr. Kreutzer, director of reclamation economics, on the Minidoka project, Idaho, to obtain motion pictures there and on the Shoshone, Riverton, Belle Fourche, and North Platte projects for a reel illustrating settlement activities.

Charles A. De Kay, engineer draftsman, has been transferred from the Denver office to the field office at Stony Gorge, Orland project.

Recent visitors on the Orland project included George C. Kreutzer, director of reclamation economics; R. E. Kelly, manager of the industrial department, Southern Pacific Co.; E. F. Steuwe, associate editor, Bureau of News, Southern Pacific Co.; and Phillip Schuyler, editor of Western Construction News.

District Counsel J. R. Alexander attended the two mass meetings on the Grand Valley project held for a discussion of the repayment contract.

An inspection of the lands on the gravity extension unit of the Minidoka project was made recently by George C. Kreutzer, director of reclamation economics; B. E. Hayden, and W. W. Johnston, reclamation economists; and W. J. Martin, assistant supervisor of agriculture, Union Pacific System.

A board of engineers consisting of A. J. Wiley, D. C. Henny, W. H. Nalder, George O. Sanford, and Ralph Lowry, convened recently at Gibson Dam, Sun River project, to inspect and report on various features of the work in connection with the construction of the dam.

Prof. O. L. Waller, engineering dean of the State College of Washington, and H. W. Lawler, general superintendent of the Utah Construction Co., were recent visitors at Gibson Dam, Sun River project.

Rhea Luper, State engineer of Oregon, and W. G. Ide, manager of the Oregon State Chamber of Commerce, visited the Vale project during the month.

G. C. Wright, Bureau of Plant Industry, United States Department of Agriculture, spent a day on the Klamath project looking over the project and taking samples of drain and irrigation water at various points.

A congressional delegation, consisting of Hon. Addison T. Smith, Idaho; Hon. Charles E. Winter, Wyoming; Hon. Philip D. Swing, California; Hon. Samuel S. Arentz, Nevada; Hon. John C. Allen, Illinois; Hon. William C. Lankford, Georgia; Hon. James B. Reed, Arkansas; Hon. Miles C. Allgood, Alabama; Hon. John W. Summers, Washington; Hon. W. M. Whittington, Mississippi; Hon. Stewart H. Appleby, New Jersey; Hon. Albert Johnson, Washington; and Hon. Nicholas J. Sinnott, Oregon, arrived in Klamath Falls, Oreg., on August 27, and spent several hours looking over the Klamath project and discussing its problems.

A. J. Wiley, consulting engineer, expects to sail from Boston, Mass., on October 12 for India in connection with plans for the construction of several high dams contemplated by the Provincial Government. Mr. Wiley will be absent from the United States on this assignment until February, 1928.

W. R. Kepler, hydraulic engineer for the Newport News Shipbuilding & Drydock Co., spent several days at the Minidoka Dam testing the new turbin for unit No. 6 of the Minidoka power house.

F. T. Crowe, former general superintendent of construction, was a recent visitor at Minidoka Dam, Minidoka project.

Master Sergeant Dahlegren, United States Army, was on the Yuma project recently in connection with aerial photographs of the Colorado River.

J. B. Bond, former superintendent of the Boise project, who is now connected with the J. G. White Co. on irrigation work, was a recent visitor at the project office.

William Lehman, rodman, and B. A. Hall, assistant engineer, at American Falls Dam, have been transferred to the Owyhee project.

George C. Imrie, assistant engineer, formerly office engineer at American Falls, has been designated inspector of work on the bridge over the dam.

Recent visitors to the Milk River project included David Scott, agriculturist, Utah-Idaho Sugar Co.; Heber Austin, representative from the Mormon Organization, Idaho Falls; E. C. Leedy, C. D. Greenfield, Leonard Ball, and Dan Willard, agricultural development agents, Great Northern Railway; and G. L. Liebault, State horticulturist, University of Louisiana.

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, under the authority of the Commissioner of Reclamation and the Secretary of the Interior.

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation. Subscriptions should be sent to the Chief Clerk, Bureau of Reclamation, Washington, D. C.

Advertising the Riverton project, Wyoming, at tourist camp

Dr. Kurt Schneider, of the agricultural college at Ronn-Poppelsdorf, Germany, was on the Yakima project during the month to obtain information on irrigation farming.

Charles Bartholet, assistant to the State Supervisor of Hydraulics, and C. E. Douglass called at the Yakima project office recently relative to taking preliminary steps in connection with the adjudication of the waters of Yakima River.

H. C. Austin, August Saunders, Leonard Ball, and K. L. Molin, representing the Utah-Idaho Sugar Co. and the Mormon interests, visited the Sun River project during the month and went over the irrigated lands. All seemed very favorably impressed with the opportunities offered on the project.

S. O. Harper, general superintendent of construction, spent two days on the Newlands project principally in connection with an inspection of the Truckee Canal tunnels, which are to be repaired this fall and winter. He was accompanied by the entire district board and Project Superintendent Stuver.

E. W. Kronquist, engineer, Bureau of Indian Affairs, visited the Newlands project recently to collect data regarding the Paiute Indian Reservation for the Board of Survey and Adjustment on Indian Projects.

Andrew Weiss, former superintendent of the North Platte project, and at present resident engineer on the Don Martinez project of Mexico; Jesus Oroposa, superintendent of reclamation, national committee of irrigation of Mexico; and A. E. Kocher, assistant chief of agronomics, spent several days on the Carlsbad project going over the project system.

The kind of an animal you raise and the price it brings depend on its breeding.

Project Water Supply

WEATHER for August in Colorado, Wyoming, Montana, South Dakota, and Nebraska was colder and wetter than normal and had a tendency to retard ripening of crops but caused excellent water conditions. On the Belle Fourche project, South Dakota, less than 60 per cent of the project had been irrigated prior to the end of the month.

Rains on the upper reaches of the Pecos River provided an ample supply of water for the Carlsbad project, New Mexico, and left the reservoir holding 21,500 acre-feet of water. The lack of water in July on this project had very little effect on the crops.

West of the Rockies weather conditions were about normal for temperatures and slightly below normal for precipitation. Water supply conditions were good as a whole and were especially gratifying on the Okanogan project, Washington, where it now appears that there will be a holdover of around 1,500 acre-feet at the end of the irrigation season. The flow of Salmon Creek, which has maintained a better summer flow than any year since 1916, is largely responsible for this condition.

Placing reinforcing steel ahead of concrete lining, Main Canal, Kittitas division, Yakima project, Washington

U. S. GOVERNMENT PRINTING OFFICE: 1927

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards**, Assistant Secretary; **E. O. Patterson**, Solicitor for the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — P. W. Dent, Assistant Commissioner — George C. Kreutzer, Director of Reclamation Economics

W. F. Kubach, Chief Accountant — C. A. Bissell, Chief of Engineering Division — Hugh A. Brown, Assistant Director of Reclamation Economics

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher		E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	A. W. Walker	Erle W. Shepard	Miss E. M. Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr	H. C. Stetson	Virgil E. Hubbell	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	Nyssa, Oreg	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. R. Fiock	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River [9]	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [10]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg	H. W. Bashore	C. M. Voyen		B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	H. R. Pasewalk	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

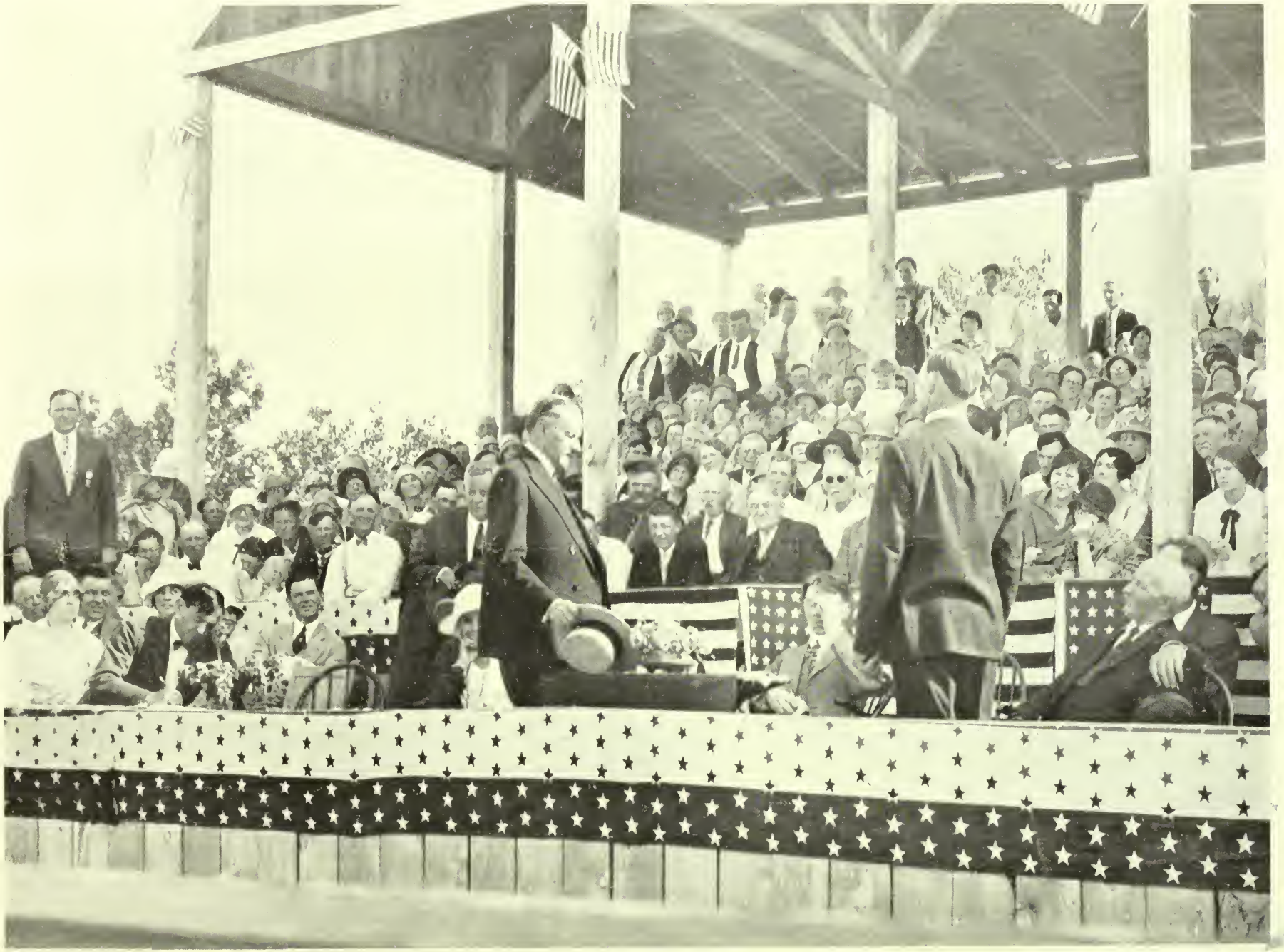
Large Construction Work

Minidoka, American Falls Dam.	American Falls, Idaho		H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [11]		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [12]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam.	Augusta, Mont	Ralph Lowry [12]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [12]	C. B. Funk		R. J. Coffey	Berkeley, Calif.

[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.
[2] Operation of project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District and Gering and Fort Laramie Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926.
[9] Operation of Fort Shaw Division assumed by Fort Shaw Irrigation District on Dec. 31, 1926.
[10] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District informally on July 1, 1926, and formally, by contract, on Dec. 31, 1926.
[11] Resident engineer
[12] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Cache la Poudre investigations	Denver, Colo	Thomas Hawthorne	Poudre Valley Water Conservation Association.
Middle Rio Grande	Albuquerque, N. Mex	C. C. Elder	Middle Rio Grande conservancy district.
Salt Lake Basin, Rush Lake, and Moon Lake	Salt Lake City, Utah	E. O. Larson	State of Utah.
Yakima project extensions	Yakima, Wash	J. L. Lytel	
Columbia Basin Project	Lind, Wash	B. E. Hayden	
Truckee and Carson River	Reno, Nev	A. N. Burch	
Heart Mountain investigations	Powell, Wyo	I. B. Hosig	
Southern investigations	Washington, D. C	C. A. Bissell	States of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee.



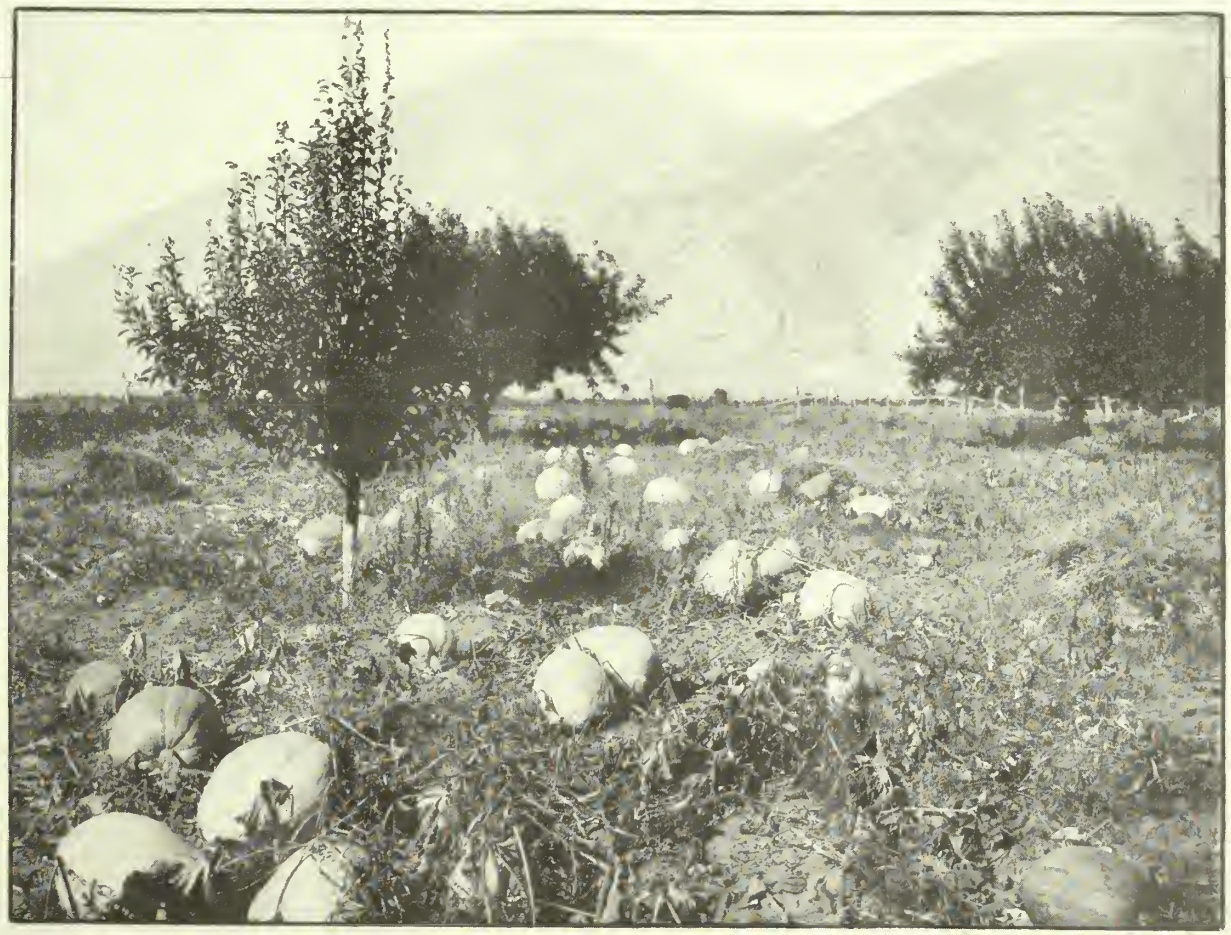
President Coolidge at the Butte County Fair, Nisland, Belle Fourche Project, South Dakota

(See Page 146)

I27.5: 1927

NEW RECLAMATION ERA

VOL. 18 NOVEMBER, 1927 NO. 11



THANKSGIVING

Clemson College Library
Government Publications

Principles Which Should be Included in Successful Land Settlement

SETTLERS must be selected. Developing farms under irrigation requires a certain amount of capital and certain definite qualities. Without these only disappointment can result.

They must be settled on the land, not in isolated units, but in groups or colonies of sufficient size to secure economic and social advantages.

There must be aid and direction in the preparation of the land for irrigation. In this, cooperation is important. Settlers working as a community can do many things better than as individuals working alone.

Many settlers who love farming and who, if given a chance, will become good farmers have inadequate capital. They should be helped to get a start by means of credit banks or other special arrangements.

Markets must be studied, crop rotations suggested, and a program of marketing worked out suited to the conditions which govern transportation from the producers to markets.

The payments of the initial years must be made as easy as possible.

The aim should be ownership of small farms rather than tenancy on larger estates.

ELWOOD MEAD
Commissioner, Bureau of Reclamation

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 NOVEMBER, 1927 No. 11

Interesting High Lights on the Reclamation Projects

FOUR carloads of automobile trucks were delivered recently to agencies on the Shoshone project. As stated by the Powell Tribune, this is a good barometer of the increasing prosperity of the Powell Valley.

THE principal work during September on the Stony Gorge Dam, Orland project, was the placing of concrete for the parts within the cofferdam to build all parts up above ordinary water level except the closure openings, so that the creek may be turned back through the closure openings before the time for winter floods in November.

THE Potato Growers' Exchange and the Bean Growers' Association on the Grand Valley project are both active in taking care of the harvest of these crops. The shipment of beans is being made through the potato growers' stations and equipment.

THE Malta Commercial Club, Milk River project, is taking renewed interest in the settlement of the project, and several members are spending considerable time in securing the return of forms circularized some time ago relative to the sale of lands and the construction of buildings on unoccupied farms.

THE cotton crop on the Carlsbad project is being picked and ginned, with gins operating full time. The yield is very good and the crop is being sold as rapidly as picked at prices averaging about 23½ cents a pound.

A COMPILATION of the Yakima Valley Traffic and Credit Association shows that 5,183 cars of fruit and vegetables had been shipped from the valley to October 1, consisting principally of apples, mixed fruit, plums and prunes, apricots, pears, peaches, cherries, strawberries, grapes, melons, onions, and potatoes.

FAIRS were held recently by Morrill, Goshen, and Scotts Bluff Counties on the North Platte project. All report a record attendance and the best exhibits ever shown of both agricultural products and livestock.

THE Colorado Potato Growers' Cooperative Association expects to handle the bulk of the potato crop on the Uncompahgre project and part of the onion crop, especially of those growers who also raise potatoes.

AN election by the settlers of the Black Canyon irrigation district, Boise project, to ratify the contract with the United States for the construction of the Payette division, was held on September 30 and carried with only one dissenting vote. The required recordable agreements with the individual landowners in the district are being secured.

A COMMISSION of livestock experts from Russia recently purchased 152 head of purebred Hampshire ewes from Minidoka project owners for breeding purposes. The price paid was $40 and $42 a head.

THE airplane landing field at Burley, Minidoka project, has been selected as an official airport on the Salt Lake-Pasco mail route. Tentative arrangements have been made for the erection of beacon lights.

CONSIDERABLE interest is being taken on the Yuma project in growing paper-shell pecans, and one syndicate has been formed locally with the intention of planting several large acreages. There are a few small acreages in the valley division which are producing very satisfactorily and additional small plantings have been put in during the past year. The water table and the climate are considered very favorable for this crop.

THE Lynch-Cannon Engineering Co. completed on September 17, two weeks ahead of schedule, all work under its contract for the construction of the bridge over the American Falls Dam.

THE main electric power lines being built by the Truckee-Carson irrigation district, Newlands project, to Stillwater and Harmon communities are nearing completion. Preliminary plans are under way to further extend the electric lines to Fernley, Wadsworth, Northan, Swingle Bench, and the island districts. Electrification of the project farms is one of the most progressive steps taken by the district in recent years and it will aid materially the intensive development of the farms.

THE Farm Settlement Bureau, organized by the various irrigation districts on the Klamath project and the Klamath Falls Chamber of Commerce, reports that 10 private land holdings, comprising more than 1,200 acres in the Langell Valley and Horsefly irrigation districts, have been listed for sale. They also have prepared a list giving a brief description of each farm, which is being distributed to prospective settlers.

THE new Black Hills sugar plant on the Belle Fourche project was steaming up the latter part of the month preparatory to opening and slicing beets the 1st of October. The new railway beet spurs and beet dumps have been completed and were receiving beets, with the exception of the last dump east of Vale, which was expected to be ready early in October. The new Vale elevator was ready for business and graveling on Highway 212 had progressed about 10 miles from Belle Fourche.

ABOUT 40,000 pounds of butterfat per month is being received at the plant of the Mini-Cassia Dairymen's Association, Minidoka project, in addition to the product marketed at local cream stations and cheese factories.

Economic Notes from the Reclamation Projects

Regulations for Taking Crop and Livestock Census

On Federal reclamation projects for year ending December 31, 1927

THE crop and livestock census for the year 1927 on Federal reclamation projects shall be taken by employees of the bureau under the direction and supervision of the project superintendent, except on projects which have been turned over to the water users, when the census shall be taken by employees of the water users' association or irrigation district under the supervision of an employee of the Bureau of Reclamation designated by the commissioner. If no such supervisor of the census is designated by the commissioner, then the manager or superintendent of the district or association shall act as supervisor of the census. The methods employed will be similar to those followed in 1926, except as hereinafter explained.

CENSUS FORMS

The record forms to be used by the enumerator will be the usual Bureau of Reclamation Form 7-332, as modified in 1925. The Washington office of the Bureau of Reclamation has a supply of these forms on hand, and the various projects should request the number required for this year. Surplus forms on hand from the 1925 or 1926 supply may be used this year, and this should be taken into account when requesting forms. The form enumerates most varieties of crops produced and stock kept on the various projects. Blanks are provided on the form for listing additional items. Automobiles, trucks, and tractors should be listed and valued separately from other farm equipment which should be valued as a lump sum.

ACCURACY OF RECORDS

The Bureau of Reclamation has found the crop and stock census data taken annually in past years to have great value for reference. Under section 4 of the act of December 5, 1924 (43 Stat. 672, 701), which provides for repayment of construction costs on the basis of the average gross annual acre income, these census data become of paramount importance and should be collected with great care. The enumerators should interview the farmer and secure his cooperation if possible. Absentee owners and other conditions will necessitate the use of good judgment based on the best information obtainable. Form 7-332 should be dated and signed by the owner where possible, otherwise by the enumerator.

SUPERVISOR

The project superintendent shall be the supervisor of the census on projects being operated by the United States. On projects being operated by the water users, an employee of the Bureau of Reclamation appointed for that purpose or the manager or superintendent of the water users' association or irrigation district shall be the supervisor of the census. The project superintendent, or employee of the Bureau of Reclamation designated as supervisor of the census, or the manager or superintendent of the water users' association or irrigation district, as the case may be, shall appoint the enumerators and review their work. He shall confer with leading produce and commission men and water users of the project and determine the values to be applied to the various crops. He shall have prepared under his direction the necessary summaries of all data collected and transmit the original copy to the Washington office of the Bureau of Reclamation and a duplicate copy to the Denver office of the Bureau of Reclamation. Before the census shall be of any effect on those projects which have been turned over to the water users it is necessary that the Secretary of the Interior approve these summaries.

INFORMATION SHOWN

The crop census shall show, with respect to each farm, the total number of irrigable and irrigated acres, the number of acres of the various crops grown, the yields per acre, and the values of such crops. Supplemental data showing whether the crops were sold, fed, or stored should be shown.

HOW TO VALUE

Many farmers will not have sold their crops; then the enumerator shall place a value upon such crops in accordance with the unit prices as fixed in general by the supervisor; others will have fed hay and grain to livestock, and the value of such crops shall be determined as if the crops had been sold. Hay, fodder, or other harvested forage shall be valued in the stack on the farm. Crops such as grain, beans, potatoes, seeds, etc. shall be valued f. o. b. cars, shipping point, exclusive of the cost of containers. Fruits, berries, and vegetables shall be valued f. o. b. cars, shipping point or warehouse, exclusive of the cost of grading, packing, storing, and containers. All factory crops such as sugar beets, string beans, cucumbers, tomatoes, etc., shall be valued at the selling price to factories or dealers (including estimated bonuses) f. o. b. shipping point, when not delivered direct to the factory. Grain crops which were not harvested for hay or grain should be included as pasture. A distinction should be made in value between tame and wild irrigated pasture, and the value should be a reasonable annual rental for such pasture. Straw, sugar-beet tops, hay and grain stubble, etc., and other by-products should be listed and valued. All gardens and miscellaneous crops should be listed and valued.

Klamath County Fair Most Successful Held

According to C. A. Henderson, county agent, the most successful fair Klamath County, Oreg., has ever held ended September 5. Nearly 7,000 people attended the fair. The new exhibit building, constructed at a cost of $20,000, was completely filled with the finest exhibits and displays ever shown in Klamath County.

Mr. Henderson states that the exhibits of livestock were well balanced and showed considerable improvement over those of previous fairs. These included more than 50 head of beef cattle, 100 head of dairy cattle, and an increased number of sheep and hogs. Rabbits comprised more than 200 entries, compared with 75 in 1926, and showed much improvement in quality. Poultry was on a par with any previous year.

The outstanding features of the new exhibit building were the seven community booths, the quality of each being far superior to that of any previous year. All booths scoring above 79 were awarded the purple ribbon and a $50 cash prize. Langell Valley, Merrill, Klamath Indian Reservation, and Central Community Club all qualified for this prize. Malin, Bonanza, and Wood River received honorable mention.

The boys' and girls' club work was amply represented in all classes, with demonstration teams performing in the cooking and homemaking clubs. Particularly in the dairy classes, many blue ribbons were won by club members.

Dairy Cattle Credit Corporation On the North Platte Project

By George C. Kreutzer, Director of Reclamation Economics

ON the North Platte project, Nebraska-Wyoming, a credit corporation has been organized and incorporated for $100,000, under the State laws of Nebraska, to finance the purchase of dairy cattle. Twenty-five thousand dollars was raised among the business men in Omaha, such as the Standard Oil Co., wholesale grocers, two of the largest banks, and other establishments which derived a large amount of their business from the North Platte Valley. Twenty-five thousand dollars was raised locally from business men and farmers. It is necessary for local capital to be in such a corporation to show their good faith and to insure the corporation being managed economically and along sound business lines. The Omaha business men promised to raise the additional $50,000 when needed.

The purchase of capital stock creates the funds to be loaned to farmers on dairy cattle. A mortgage is taken over the cattle purchased, plus additional animals, so that the loan does not exceed 80 per cent of a fair value of the security. The notes and mortgages are then transmitted to the Intermediate Credit Bank at Omaha and rediscounted at 4¾ per cent. The corporation, however, guarantees the payment of these loans. The spread between the 4¾ per cent charged by the Intermediate Credit Bank and 7 per cent charged the borrowers provides a fund for administration, appraisal, and for the creation of a reserve fund. The intermediate credit act provides that interest rates can not exceed the rediscount rate by more than 2½ per cent.

When I visited the North Platte project on my recent trip the association had already loaned $35,000 and had brought in 18 carloads of cattle. The purchase of these cattle is arranged for by the association and a small handling charge of about $5 a head added to take care of these services. Most of the cattle were purchased in Wisconsin and consisted of young heifers around 2 years of age. There is not the chance of loss in buying young stock as there is on mature cows. The young stock have everything in front of them. The purchase price of these heifers, which in most cases would be ready to freshen in two or three months, varied from $100 to $135 and were from high-grade herds, having cow-testing records. Only one carload was purebred, and these, I understand, cost from $150 to $160 per head. Generally, the association does not favor the buying of purebred cattle, and this bears out my experience, unless they can be bought as calves or yearlings and at a low price.

The association collects its money in 36 equal monthly amortized payments and through orders on cheese factory or butter plant. It is believed that one good man could make the loans and inspect herds frequently regarding feeding and care of cattle for about a million dollars worth of credit. If feeder loans are included in the set-up, he could, of course, look after more business.

The intermediate credit act permits such a corporation to rediscount its paper through the bank to the extent of ten times its paid-up capital and surplus. Thus a $10,000 corporation should secure $100,000 in credit. The one at North Platte contemplates the use ultimately of $1,000,000 in credit because it is incorporated for $100,000.

The difficulty with such institutions is to nurse them along until sufficient business is secured to pay the overhead expenses. At North Platte their corporation is being nursed by the president of the North Platte Valley Telephone Co., whose sole interest in the matter is to make farmers prosperous and thereby create a demand for telephones. In the meantime, he is charging them nothing for bookkeeping or for his time, which is valuable because of his wide business experience.

Dairy Cattle Arrive on North Platte Project to Augment Valley Herds

A RECENT issue of the Scottsbluff Star Herald states that two more cars of dairy cattle for farmers of the North Platte Valley arrived in September, bringing the total shipments to 14 cars. Of these, one car were pure-bred Guernseys and the balance were pure-bred Holsteins.

The two cars were brought in by John Wilson who, with Eben D. Warner and Phil Rice, has been in the dairy States to the East making selections for the farmers who are bringing in good foundation stock with which to build up the herds in the valley and make this section one of the coming dairy sections of the country.

Four cars were brought in recently by Phil Rice and have been already placed on the farms over the valley. In this shipment was one car load of heifers with the balance mostly coming three's. In the two cars are included 15 pure-bred young bulls, all 1 and 2 year olds, most of them ready for light service. These bulls and many of the cows and heifers are from the Sir Pietertje Ormsby Mercedes 37th and the Spring Brook Bess Burke 2d strains.

Both these strains are already well known and established in the valley where their records are holding up to what might be expected from descendants of these illustrious lines. One of the features of the method of buying which is used by the finance corporation is the fact that most of the recent shipments are being brought in with an average cost to the farmer of around $115 to $120.

Some of the cows are higher, as the individual wishes of the buyers are considered and some of them prefer older stock with records already established. None of them, however, are bringing such prices as to make them prohibitive to the local men.

Mr. Warner, who is looking after the affairs of the finance corporation which is backing the dairy movements, states that he expects the total shipments to reach 40 cars in the near future. He already has over 150 applications for stock that have been approved by the finance corporation and there are many other applications which have not yet been passed on by the board.

Mr. Warner just returned from a trip which took him through 10 States, including the dairy sections, and states that he is exceptionally well pleased with the prospects for the valley. He has great faith in the future development of dairying in this section, with the ultimate result of more prosperity for the farmers and the entire valley.

The basis of pure breeding in the United States, except in the case of poultry and pet stock, is pedigree registration. That is, animals to be classed as purebred must be registered in a book of record established for the breed.

Prepotency is the power of an animal, male or female, to stamp its characteristics on its offspring.

Riverton Project Gate Keeper Takes 11 First Prizes for Crops

By H. D. Comstock, Superintendent Riverton Project, Wyoming

W. T. PEYTON, gate keeper at the Wind River Diversion Dam, Riverton project, Wyoming, broke up a garden of 4 acres at the highest point on the Riverton project at an altitude of 5,550 feet above sea level in the spring of 1926. His success in his garden operations that year is told on page 200 of the NEW RECLAMATION ERA of November, 1926.

In 1927, in spite of the fact that his duties as gate keeper took more time and his garden was somewhat injured by hail about July 28, and that the exhibits at the Fremont County Fair were greater in number and better in quality, making competition more keen, he was even more successful. His exhibits took 11 first prizes as follows: Irish Cobbler potatoes, table stock; red McClure potatoes, table stock; Irish Cobbler potatoes, seed stock; red McClure potatoes, seed stock; cucumbers for table use; cucumbers for pickling; parsnips; leaf lettuce; table carrots; spinach; oyster plant. Seven second premiums as follows: Individual farm booth; display three varieties of potatoes; Swiss chard; kohl rabi; celery; rhubarb; table peas. Five third premiums as follows: Bliss Triumph potatoes, table stock; beets for table use; summer squash; cauliflower; crooked-neck squash.

In addition Mrs. Peyton took first premium for canned cauliflower and hubard, second premium for canned beets, carrots, cherries, and plums, and third premium for canned peas.

This year the fair association sent a few of the best exhibits to the State fair at Douglas. At this fair Mr. Peyton's red McClure potatoes took first premium and his oyster plant took second premium.

The people at and near Pavillion arranged a booth at the county fair with no attempt to secure individual premiums but rather to show doubters what the project lands could do. This booth made a very creditible appearance, especially in the line of vegetables and flowers and aroused much favorable comment. Mrs. Geo. W. Crowder took first premium on grape jelly, Mrs. Powers second premium on a braided rug, Mrs. A. G. Keys second premium on a hooked rug, and H. V. Ferriss second premium for photographs of county scenes.

John Hays, whose ranch is located on Dry Creek about 2 miles above the main canal, took several premiums for dairy produce.

Railroad Development in the Snake River Valley

By R. J. Newell, Superintendent, Boise Project, and Joel Priest, of the Oregon Short Line Railway Company

RECLAMATION of the desert lands of the Snake River Valley was begun 60 years ago, and its development has been both extensive and rapid until the great crescent of the Snake, in southern Idaho, has become one of the world's greatest and most productive irrigated areas.

The United States Government has contributed largely to this development by the construction of the Boise and Minidoka reclamation projects and the American Falls reservoir, which latter has reinforced practically every water right in the upper valley.

The valley is served by one railroad system, the Oregon Short Line. Rapid expansion and improvement of this system have been necessary to furnish the increased facilities required to take care of the products of irrigated acreage.

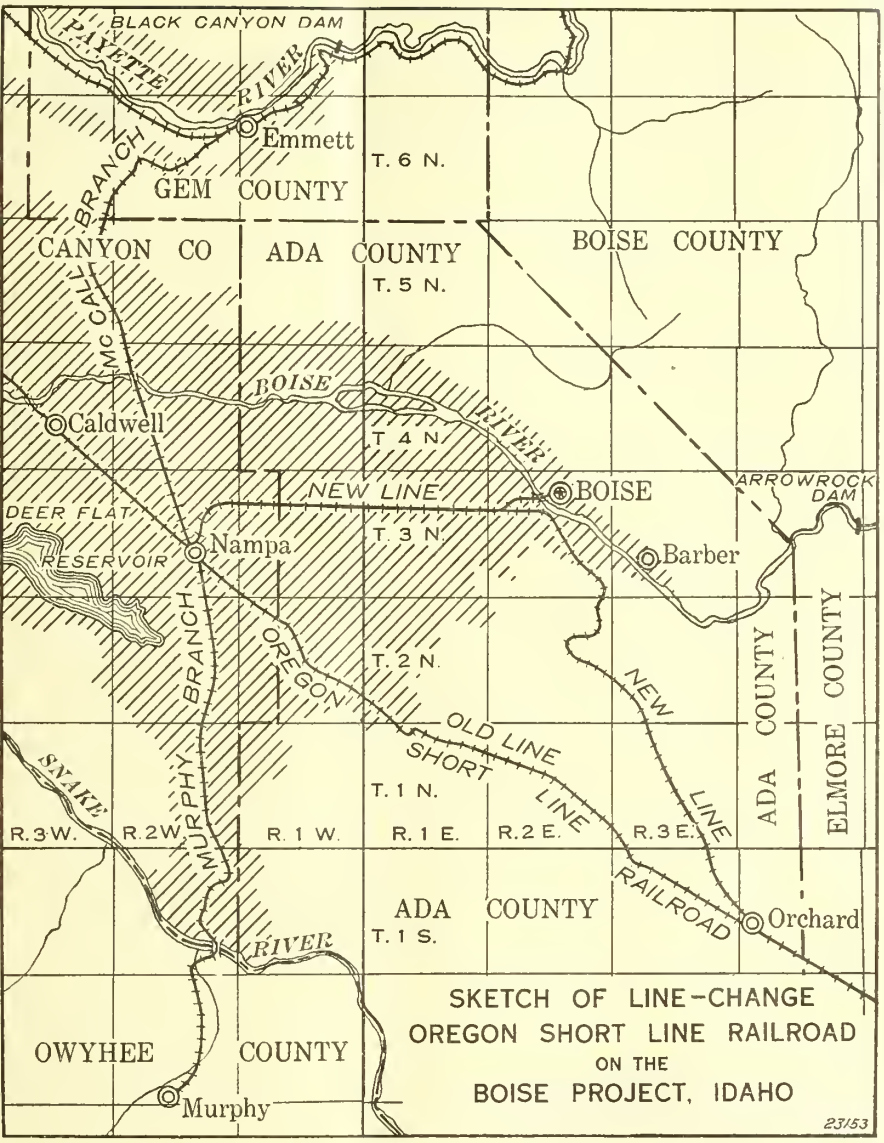
New Oregon Short Line railway station, Boise, Idaho

The chief engineer has furnished a statement listing the capital expenditures on extensions, line changes, and double tracking since 1922, which totals $7,860,000.

The most important feature of this improvement program has been the relocation of the main line between Nampa and Orchard to pass through Boise. This line revision, which is indicated on the accompanying sketch, included the construction of 29.8 miles of additional main track at a cost of $3,014,800.

Passenger, mail, and express service for Boise has been greatly improved thereby, a saving of two hours time in traffic to and from the East and 40 minutes on western traffic being accomplished. In addition to the saving in time, fares to and from points east have been reduced about $1 each. As Boise's eastern passenger traffic amounts to not less than 2,500 fares per month, the change has resulted in a direct saving to the public of $2,500 per month in cash and 2,500 persons per month have each been saved two hours' time and the inconvenience of the change at Nampa that was originally necessary.

This costly improvement was deemed justified in view of the steady growth of the city of Boise, based on the solid development of irrigation farming in the Boise valley and in general over the State of Idaho, of which Boise is the capital city.



Belle Fourche Project Asks Credit Legislation

The following resolution has been adopted by the board of directors of the Belle Fourche irrigation district, Belle Fourche project, South Dakota:

Whereas resettlement of the unoccupied farms in the project is the major development activity, more farmers being necessary to produce the specialized crops suitable in the project; and

Whereas such resettlement is largely dependent upon getting more and better buildings erected on many project farms; and

Whereas about 400 farms in said project need building improvements before suitable occupants can be secured; and

Whereas land credits with ordinary agencies have been and still are so restricted as to be inadequate under the given conditions and practically no money available for building loans; and

Whereas the development of the project from the sandpoint of the settlers, the United States, and the industrial concerns here represented, calls for more ample land credits: Therefore, be it

Resolved, That we request our delegation in Congress to secure legislation providing for a system of land credits within the Federal Bureau of Reclamation enabling owners of irrigated lands to borrow money on first-mortgage loans for the purpose of constructing buildings and other real-estate improvements upon their lands.

Dated at Newell, S. Dak., this 9th day of September, 1927.

BOARD OF DIRECTORS,
Belle Fourche Irrigation District, S. Dak.
CHARLES M. REID, *President.*
C. E. LIVINGSTON.
G. W. MORSMAN.
SYLVESTER ALLISON.
W. C. STAIGER.
HANS SORENSEN.
W. D. BUCHHOLZ, *Secretary.*

Miniature Farm Shown At County Fair

The Richland County Fair was held recently at Sidney, Mont., on the Lower Yellowstone project. Exhibits of agricultural products were excellent and the fair was a success from every standpoint. A miniature irrigated farm, 6 by 12 feet in size and representing 80 acres, was prepared by the project employees. The farm showed various systems of irrigation and a complete crop rotation. Seed was planted in the plots so that the crops were actually growing and water was constantly running in the ditches. The exhibit attracted much attention, particularly from visitors not familiar with irrigation.

This is the time of the year when many stock owners go to fairs or livestock shows. There one can get much good information by looking at the stock and talking with the exhibitors.

Oregon Short Line railway station, Nampa, Idaho

Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

The Calory: Its Meaning and the Part It Plays in Everyday Life

THE word "calory" is derived from "calor," a Latin word meaning heat. It is a unit for measuring quantities of heat, just as an inch is a unit for measuring length or a pint is a standard for measuring liquids. Government specialists contend one calory equals the amount of heat required to raise the temperature of a gram of water 4 degrees.

SOME FACTS ABOUT FOOD

If some person claiming superior knowledge stated that he had the secret of long life everyone would immediately be interested or, to say the least, curious, and yet the advice of physicians goes unheeded by many year after year when they say the best way to prolong and enjoy life is to do everything moderately, and this is particularly true of eating. Research brings to us the means of planning our meals so that they may be well balanced and furnish the required fuel for strength and energy. Foods are divided into three classes:

Protein, which supplies the material to make the framework of the body, the muscles, skin, cells, and fiber, and will be found in such foods as spinach, white of egg, whole milk, butter, cream, and cod and other fish liver oils.

Carbohydrates furnish energy and are contained in pastry and candy, nuts, white bread, and ice cream.

Fats furnish heat, contained in abundance in cream cheese, pork, goose, and egg yolks.

The first named is more easily stored up by the adult than the latter two, which expend themselves more readily as we go about our daily tasks, recreation, and exercise, or, in other words, burn themselves out, just as fuel burns in the heater.

Fruits and vegetables have medicinal values.

It is not generally known that onions and celery are good for nervous people, and that either cooked or raw, if eaten persistently and in large quantities, they will aid in overcoming insomnia.

A sirup made of onions and sugar is a "tried and true" remedy for colds and hoarseness.

Spinach, asparagus, and dandelions are rich in iron and should be eaten by persons who are anæmic.

Tomatoes act on the liver.

Raw carrots or beets are excellent for the blood.

Adults are inclined to eat too much for their own good. Whether you are eating over or under your requirements can best be gauged by weighing often—this will eliminate guesswork as to how much food you require, as your weight will register the result.

Convenient kitchen with tea wagon made by housewife from two folding chairs

Kitchen Convenience

This well-arranged farm kitchen is in Essex County, N. J. The modern sink, with its double drain boards, is placed sufficiently high for a medium tall women. It has splendid light from the double window above and also from the window in the dining alcove, which is near enough to make meal getting a very simple problem, yet just enough removed from the activities of the kitchen to be pleasant.

The useful tea wagon was made by the home-maker and her husband out of the backs of two folding chairs that were no longer fit for service.

The stool on which one can sit while washing dishes is also homemade. The wooden rack saves the bottom of the sink from marks made by the dishpan. Other features that make this kitchen attractive to work in are the cretonne curtains over the sink, and the appliqued drapes in the alcove.

Appreciation

"Have I not cured ten and where are the other nine?"

Mrs. Hayward's friendly and appreciative note of the part the Bureau of Reclamation is taking in making solvent enterprises of all our projects deserves special mention. So often we are either too busy or unmindful of what a little statement of appreciation means to those who are laboring for a big cause.

As these articles by project women appear, I trust it will act as an incentive for further expressions from project women. Just as you enjoy reading these, so will others enjoy anything you might write. Let us now start a little teamwork in putting over a bigger and better section of interest to women in our NEW RECLAMATION ERA.

In the September issue of the ERA appears an article entitled "Cooperation" and into the mind of the writer came the lines written by Kipling on the subject.

It is quite a coincidence that these same lines should come into the mind of one of our project women on the Minidoka project, and also that this same subject should suggest itself to her in writing for the ERA. The thought is so nicely carried out that I am presenting the article as she wrote it, as I feel sure any thought along this line is never voiced too often.

Cooperation

By Mrs. Williard Hayward, Rupert, Idaho (Minidoka Project)

It is particularly pleasing and encouraging to Idahoans at this time to note the harmony and cooperation between agriculture and industry in this State. These two mighty factors of our Commonwealth, the real basic elements in all that the State is or may become, have had at times their little misunderstandings and antagonisms. Fortunately such a situation no longer exists; the two have joined hands for progress, prosperity, and happiness of the State as a whole. May this unity and cooperation be everlasting.

On our Minidoka project we find the same splendid cooperation, with all farmers and business people working for the upbuilding of the community. Many of our business people were once homesteaders, developing their farms from the sage, and some at the present time own farms as an investment, thus giving them an insight into the problems of the farmers. We find our farmers a splendid class of people, home loving and with a desire to make this country such that their children will be content to make it their home.

The people are appreciative of the cooperation of the Bureau of Reclamation that made this project possible. The assessed valuation of real estate and other property on the gravity division has been increased from the original investment of $2,854,868.30 to $13,290,000, the major portion of which is the result of the Government's investment of $2,810,000 in the irrigation works to serve the lands in the division.

The gross value of crops grown on all projects during the last 10 years on land irrigated from works constructed by the Government amounts to more than $1,000,000,000, or an average of $53 per acre each year, about twice the per-acre returns from the United States as a whole.

Crop returns from the gravity unit, Minidoka project, for the seven years ending 1926 show a total of $12,936,617. The crops for the year 1925 alone amounted to $2,539,667, while the total construction charge for the gravity unit as of January 1, 1927, was $2,854,868.

The Community Club and the Grange, composed of both business people and tillers of the soil, are found sitting in common council discussing their mutual problems. They believe that in council there is wisdom, and it is wisdom that will make for the progress of any people and for the development of any project.

With this understanding there comes the desire for harmonious relations. Warfare is destructive. It destroys energy and wealth; cooperation is constructive. It harbors and increases wealth, it builds, it leaves a lasting monument—it is the real genius of good American citizenship.

One outstanding example of teamwork has been demonstrated in Minidoka County the last two years in maintaining the county fair. Although sponsored by the Pomona Grange, a goodly portion of the financial help came from the business people. All worked shoulder to shoulder and staged a fair that any county could well be proud of.

An exhibit was sent to Boise, a distance of 200 miles, to be entered in the State fair. It attracted a great deal of attention and received first prize for display and second place on points. This did much to advertise our county.

But through all activities, whether play or work, you will note "The Everlastin' Teamwork."

Salt River Power Helps Pay for Project

The Associated Arizona Producer prints the following in a recent issue:

"The entire output of the Salt River project power system for the months of May, June, and July was 80,000,000 kwh, of which the largest was July, 30,000,000 kwh.

"Perhaps this would be more intelligible to the water users who benefit from this income to express it in terms of dollars and cents. The money value of this power was $600,000, actually billed out or used on the project. For the 10 months beginning October, 1926, and ending July 31, 1927, the gross power revenue was $1,150,000. The very large proportion of this earned in the last 3 months of the 10 is due principally to the influence of the Horse Mesa plant. The above are round numbers, of course.

"August and September output should place the year's earnings at more than $1,500,000. It is indeed gratifying to the great bulk of the shareholders of the water users' association and to its officials, whose faith has brought this great world-famous development to completion, to be able to exhibit figures like these to the few who doubted."

Dedication of American Falls Dam, Idaho

By E. B. Darlington, Superintendent, Minidoka Project, Idaho

COMPLETION of the American Falls Dam, on the Snake River, Idaho, forms the second largest storage reservoir for irrigation in the United States and marks an epoch in the agricultural and industrial life of southern Idaho. By impounding flood waters which heretofore have run inutile to the sea, this structure now affords security of water supply for the irrigation of a large part of Snake River Valley. The capacity of the great basin which has been closed by an artificial barrier is 1,700,000 acre-feet, enough water to cover the entire State of Rhode Island more than 2 feet deep.

Desiring to commemorate the completion of construction and to emphasize the significance of the reservoir as an asset in the social and economic development of this region, the residents of American Falls and neighboring communities arranged a formal dedication program, and on September 28 the town was thronged with people to witness and participate in the ceremonies. During the day the dam was thrown open to inspection by the public, and many visitors drove over the new roadway traversing the top of the structure, walked through the interior galleries, and examined the mechanism for regulating outflow.

The dedication exercises consisted in general of an outdoor pageant and a program of addresses and music carried out in one of the local theaters on account of disagreeable weather conditions. Among those who participated in the various functions of the day were some of the most distinguished citizens of Idaho, including a number of the men who, by their foresight, zeal, and energy, have helped to make possible the accomplishment of this great undertaking.

The first address was made by Construction Engineer F. A. Banks, who has been closely connected with the work since its inception and whose ability and ardor during both the promotion and the construction stages have in large measure brought the project to successful fruition. Mr. Banks sketched the history of the development and described some of its unique phases, among which were removal from the submerged area to higher ground of almost the entire town of American Falls; the organization of a giant irrigation district embracing lands in several counties; the financing of a large part of the costs by cooperation with the Government of some 23 companies, districts, and individuals; the purchase of water rights and other property from the Idaho Power Co.; and the acquisition of some 30,000 acres of land from the Indians. Mr. A. E. Paddock, superintendent for the contractors, the Utah Construction Co., was introduced by Mr. Banks as his fellow-worker, and his work pronounced good.

Gov. H. C. Baldridge stressed the value of the reservoir as an asset to Idaho and emphasized the importance of providing foodstuffs for the future population of the Northwest, which he asserted was increasing with pronounced rapidity.

Congressman Addison T. Smith, chairman of the Committee on Irrigation and Reclamation of the House of Representatives, told of some of the obstacles encountered and difficulties overcome in securing congressional support of the project, but he felt that anyone who had been connected with the undertaking and who had helped to make it possible could now point with pride to the completed enterprise.

The scriptural pronouncement, "Without vision, the people perish," was the keynote of an address by R. E. Shepherd, president of American Falls Reservoir District No. 1 and of the American Falls Advisory Board. One of the visions which had been beheld by far-seeing men in Idaho had materialized, other opportunities for development could be discerned, and further progress would come as the result of the zeal of people who first saw visions.

Former Gov. C. C. Moore, during whose administration a large part of the promotion and construction work was done, paid a high tribute to the pioneers who conceived the project and to Government officials and others who had pushed the work to completion.

A notable feature of the program was an address by Chief Jack Edmo, of the Shoshone Tribe of Indians, delivered in his native tongue and in full tribal regalia. The address was interpreted by State Senator Maurice M. Myers, master of ceremonies of the day. Many of the Indians from the Fort Hall Reservation

American Falls Dam

were present to hear their chief speak to the white men. Chief Edmo said the river-bottom lands had long been the pasture ground for their ponies and a favorite site for camps, but if the great lake which now covered many acres was for the benefit of the country, the Indians were willing to make the sacrifice.

Outdoor phases of the celebration included a street parade, made colorful and picturesque by a file of Indians in elaborate headdresses and tribal costumes; a cavalcade of cowboys and rough riders; and a procession of school children carrying flags and pennants. Music was furnished throughout the day by the Municipal Band of Pocatello, the Rockland High School Band, and the Blackfoot High School Band.

The dam is of the concrete gravity type, flanked by earth embankments on each end. It has a total length of 5,227 feet and a maximum height of 83 feet. The spillway section is equipped with 15 radial gates operated by motor-driven hoists located in an upper gallery. There are 20 hydraulically operated high-pressure gates controlling outlets through the dam at the base. The operating mechanism for these gates is in a lower gallery. Six penstocks 15 feet in diameter have been provided to facilitate power development. Two of these, located on the east side of the spillway, are for use by the Idaho Power Co. The remaining four penstocks were built as a part of the proposed Government power plant.

The reservoir at maximum stage submerges 61,000 acres, about 30,000 acres of which were Indian lands. The storage basin is about 25 miles long and has an average width of 3½ miles. During the past summer it was filled to a capacity of a little over 1,700,000 acre-feet. There will be a holdover of nearly 1,400,000 acre-feet at the end of the season.

Advertising Signs for American Falls Dam

Two large signs of the character shown in the accompanying illustration have been erected along the old Oregon Trail in the vicinity of American Falls, Idaho, to advertise the completion of American Falls Dam and the agricultural possibilities of this region. The sign boards are 12 by 50 feet in size. The cost was borne jointly by Power County and the city of American Falls. The signs are in conspicuous locations, on a highway carrying heavy traffic, and undoubtedly direct the attention of many people to this locality.

One of two signs advertising the American Falls development

Colonization in the Argentine

A RECENT issue of the Bulletin of the Pan American Union states that the Argentine railway companies have agreed to form a joint organization for colonizing the lands served by their systems for the benefit of agriculture in particular and the country in general. The object is to bring families direct from abroad for the purpose of land settlement. Families already in the country who may wish to avail themselves of the scheme will be offered similar facilities to those accorded new arrivals.

Each company is to retain superintendence of colonies within its own particular sphere, providing the necessary funds, determining the area to be cultivated, and selecting and purchasing the lands to be colonized. The companies agree not to seek any profit in the resale of the lands to the colonists, that point being an essential condition of the organization. When colonists are charged for land, the price is not to exceed its cost price plus the value of the buildings, installation, etc., plus 10 per cent of the total sum, the latter to serve as a reserve fund for incidental expenses. Long terms of payment will be accorded to settlers for purchases of land and installations. When the purchaser has paid 20 per cent of the total price of the land he will be given a title deed, the remainder to bear interest at the rate of 7 per cent and 1 per cent cumulative amortization annually.

Arrangements have been made to advance funds to families abroad who may not have sufficient funds for the purpose of defraying the first year's working expenses after arrival, the consortium to advance a sum sufficient for the purchase of indispensable working adjuncts, such as animals, poultry, etc. The amount so advanced is to be repaid by the settler from the proceeds of the first sales made by him and prior to his making the first payment on his land.

Cooperative societies will be organized in each colony for the sale of provision, etc. A consignment section will also be opened by the consortium, to be used as a central point where the colonists will be able to sell their produce, and reasonable sums will be advanced to the colonists on their crops in storage, the consortium also being empowered to insure the crops and the homesteads. When the colonies attain sufficient numerical importance, the consortium will organize in each an urban center comprising a church, school, police station, premises for the cooperative society, blacksmith and carpentry, etc.

The capital of the consortium will be fixed by the companies in proportionate ratio and will be made up of a first quota of 25 per cent, payable when the contract is signed, and with payment of the remaining quotas of 25 per cent each when such is deemed necessary, and within 90 days of the directors' meeting at which the recommendation is made. The companies will contribute to the capital in proportion to the mileage of their lines.

Design, Construction, and Detail Cost of McKay Dam Umatilla Project, Oregon

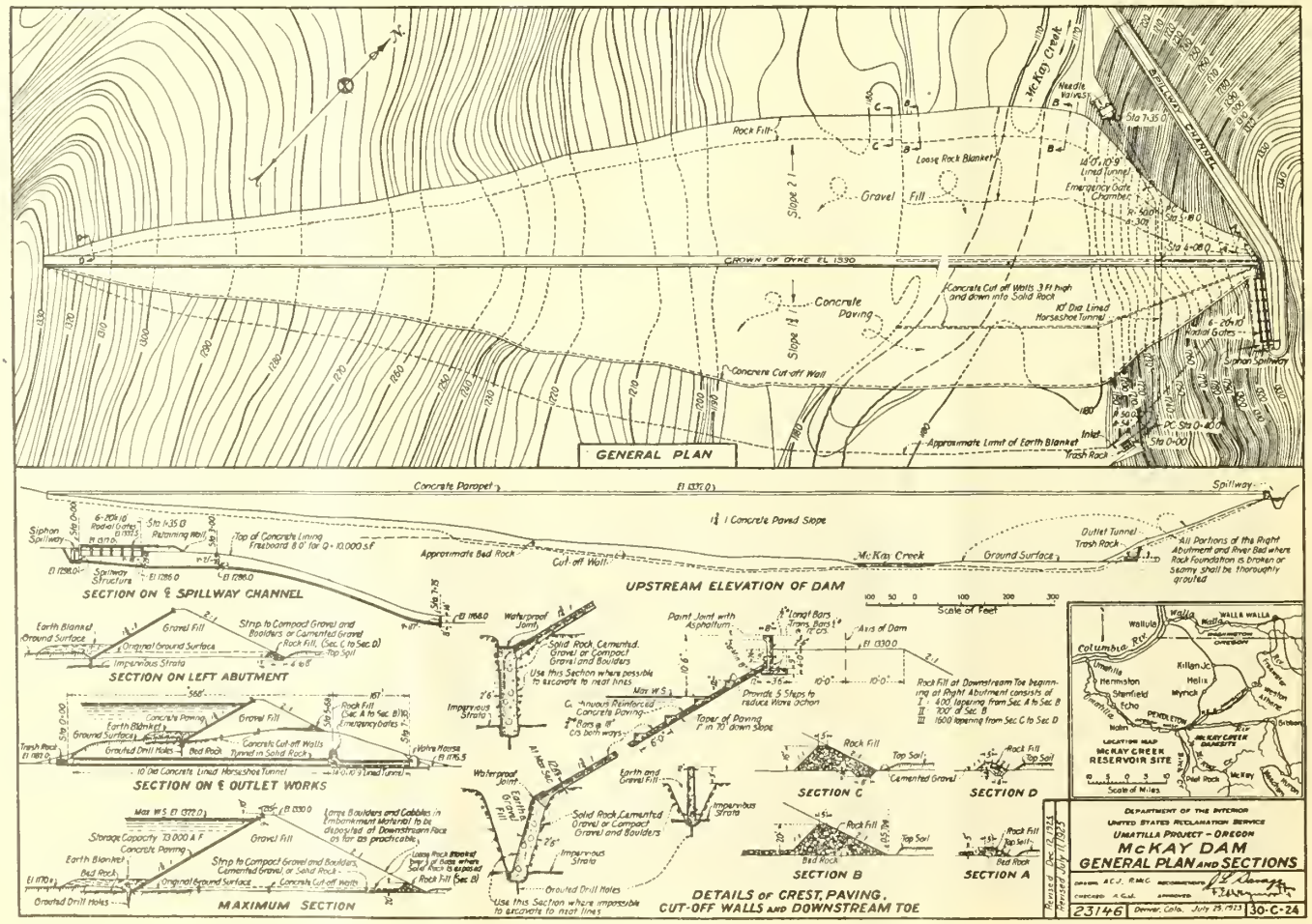
By Byram W. Steele, Engineer, Denver Office

McKAY DAM, which is located on McKay Creek 5 miles above its confluence with the Umatilla River and 7 miles south of the town of Pendleton, Oreg., has recently been completed. The dam and all appurtenant works were constructed entirely by Government forces. The storage capacity of the reservoir created by this dam is 73,000 acre-feet of water, which will be used to supplement the natural flow of the Umatilla River for the irrigation of approximately 35,000 acres, now partially developed, in the Stanfield and Westland irrigation districts and in addition will furnish water for other lands being investigated. The reservoir is a mile wide and 4 miles long and receives its storage water from both McKay and Birch Creeks, the flood waters from Birch Creek being diverted to the McKay Creek watershed through a feeder canal. The completed Umatilla project will comprise the original project of 17,000 acres, the west extension of 11,000 acres, and the 35,000 acres mentioned above, making a total of approximately 65,000 acres.

THE DAM

The dam is a gravel embankment of 2,287,010 cubic yards having a crest length of 2,700 feet and a maximum height of 165 feet. The downstream slope is 2 to 1 and the upstream slope 1¾ to 1. Before starting the embankment it was necessary to strip the left abutment and the creek bottom of all top soil down to the compact gravel or solid rock. The quantity of stripping was 160,000 cubic yards and was started in July, 1923. The stripping was done with fresnos where the haul was less than 300 feet and the remaining area was handled by loading into dump wagons with an Austin dragline equipped with a one-half yard bucket and hauling with teams. The earth blanket shown in the maximum section is composed of the top soil stripped from the foundation, which was deposited along the upstream toe of the dam and later spread as indicated on the drawing.

The material in the embankment consists of a well-graded gravel with a variable content of sand and earth as a binder. This material was obtained from the creek bottom above the dam with an average haul of about 1½ miles. The borrow pits were irrigated sufficiently to give the embankment material the right amount of moisture to insure the maximum degree of consolidation when rolled. All material was excavated with two 80–B electrically operated Bucyrus shovels, loaded into 4-yard dump cars remodeled to hold 6 yards and hauled to the dam an average distance of 1½ miles with 18 and 20 ton oil-burning dinky locomotives. After the gravel was dumped from the cars, it was spread in layers not to exceed 8 inches in thickness with horse-drawn grading machines and compacted by rolling with traction engines. Each 8-inch



layer of the fill received four trips of the roller, except a strip about 15 feet wide along the upstream slope of the embankment which received six passes of the roller. The embankment was built to an upstream slope 2 feet outside the theoretical slope and the excess material excavated and placed in the embankment.

The gravel fill was started in February, 1924, and was finished in December, 1925, continuous operation being maintained except for about one month during the winter of 1924–25. The total embankment contains 2,287,010 cubic yards and was placed at the average rate of 110,000 yards per month. The maximum daily run was 8,000 yards in two shifts and the maximum yardage placed in any one month was 165,000, which was placed April, 1925.

The equipment used in building the gravel embankment consisted of two 80–B electrically operated Bucyrus shovels used in the gravel pit, 5 traction engines and 3 grading machines used on the fill, 11 oil-burning dinky locomotives and 120 six-yard dump cars used in hauling the material 1½ miles from the borrow pit to the dam.

The upstream face of the dam, the slope of which is 1¾ to 1, is protected by a continuous reinforced concrete slab varying in thickness from a minimum of 8 inches at the top to a maximum of 12½ inches at the bottom of the highest section, the rate of increase of thickness in the concrete face being 1 inch in 70 feet down the slope. The reinforcing consists of ¾-inch round bars placed at 18-inch centers both ways and approximately in the center of the slab. The concrete was poured in alternate strips 12 feet wide placed up and down the slope at right angles to the longitudinal axis of the dam.

This reinforced concrete face slab connects at the crest of the dam with a cantilever type parapet wall 6 feet 6 inches high, being 2 feet 6 inches above the crest. At the intersection of the 1¾ to 1 slope with the cemented gravel or rock surface the face slab terminates in a cut-off trench to solid rock. In this cut-off trench in the lava rock foundation grout holes were drilled with a model 21 turbro drill mounted on a derrick at from 3 to 10 feet centers and varying in depth up to a maximum of 45 feet. After this cut-off trench was filled with concrete, cement grout was forced into the holes under air pressure of approximately 100 pounds per square inch. The yardage of concrete in the cut-off trench is 1,656, in the concrete face 17,251, and the linear feet of grout holes drilled in the bottom of the cut-off trench 11,201.

Detail cost of McKay Dam

Item		Quantity	Unit cost	Total cost
Examination and surveys				$17,248.02
Clearing and care and diversion of river				9,966.20
Excavation:				
Class I, dam	cubic yards	2,266	$0.35	790.18
Class I, stripping for embankment	do	160,155	.36	57,669.77
Class I, dam	do	2,955	.62	1,867.85
Do	do	1,758	.93	1,634.15
Class II, dam	do	1,098	2.41	2,650.89
Class III, dam	do	2,099	8.26	17,346.80
Class I, spillway	do	1,601	1.05	1,687.72
Class II, spillway	do	341	.67	227.79
Class III, spillway	do	2,553	2.09	5,344.46
Class III, spillway channel	do	32,234	2.24	72,332.90
Class I, outlet	do	266	1.40	372.35
Class II				346.88
Class III, open cut	cubic yards	1,411	3.31	4,682.30
Class III	do	360	3.97	1,430.59
Class III, tunnel	do	4,186	6.42	26,886.05
Embankment	do	2,287,010	.44	1,008,544.03
Structure drainage (dam)				71.17
Do	cubic yards	5,635	1.94	10,958.19
Do	do	45,563	.417	19,032.54
Structure drainage (spillway)				2,052.55
Grouting (outlet works)				2,698.67
Grouting (upstream cut-off in dam)	linear feet	11,201	1.43	16,034.92
Concrete:				
Dam, reinforced in cut-off trench	cubic yards	1,656.5	12.55	20,787.78
Dam, paving	do	17,251.4	14.90	256,735.04
Dam, reinforced	do	875.4	18.15	15,889.79
Do	do	594.8	19.54	10,744.54
Spillway, reinforced	do	385	12.50	4,693.89
Do	do	1,902.5	16.45	31,301.07
Do	do	580.4	24.38	14,154.62
Outlet, reinforced	do	165	17.57	2,899.87
Outlet, tunnel lining	do	1,757	16.85	29,603.75
Outlet, reinforced	do	48	24.60	1,181.75
Do				10,439.88
Riprap	cubic yards	432	5.48	2,385.60
Backfill				5,324.49
Six 20 foot by 10 foot radial gates	pounds	88,665	.20	17,526.99
Two 4 foot by 4 foot high-pressure emergency gates	do	95,920	.19	18,779.90
Two 48-inch balanced needle valves	do	44,055	.26	11,606.57
54-inch riveted steel outlet pipe	do	89,375	.12	10,860.66
Gates				730.58
Structural steel				1,377.58
Hand railing				469.99
Lighting system				2,941.38
Electric installation				2,365.11
Right of way and lands				176,133.25
Permanent improvements (gate tender's cottage)				3,097.19
Camp maintenance				34,449.20
Engineering and inspection				49,955.27
Total estimated field cost				2,018,312.71
Superintendence and accounts				43,353.41
General expense				55,161.98
Grand total actual cost				2,116,828.10
Estimated cost				2,500,000.00

OUTLET WORKS

The release of water from the reservoir for irrigation purposes is effected by means of a tunnel and two 48-inch balanced needle valves. The tunnel is located in the right abutment and was used to divert the stream flow during the construction of the fill. The total length of the tunnel, which is concrete lined throughout, is 705 feet, the upper 550 feet being a 10-foot horseshoe section. At the upper end of the tunnel is a reinforced concrete trash rack. The trash bars are five-eighths inch by 6 inches in section placed 6 inches center to center. The upper 550 feet of tunnel operates under pressure at all times. At the lower end of this section are mounted two 4 feet by 4 feet high-pressure emergency gates. From each of these gates a riveted steel pipe 54 inches in diameter delivers the water through the remaining 155 feet of tunnel to the 48-inch balanced needle valves at the downstream toe of the dam. These needle valves and the control mechanism are housed in a reinforced concrete house connecting with the lower end of the tunnel. Access to the emergency gates in the tunnel is through the needle-valve house.

The tunnel, which is in hard blue basalt and the softer forms of lava, was driven from both portals. No timbering was required and the excavation was completed in approximately three months. The tunnel muck was placed in the drain trench at the downstream toe of the dam.

SPILLWAY

The spillway is of the side-channel type, concrete lined, and is located in the lava rock in the right abutment. The spillway structure consists of a double-barrel siphon, the throat of each unit being 8 feet 6 inches wide by 2 feet 6 inches high and six 20-foot by 10-foot motor-operated radial gates designed to pass 10,000 second-feet with reservoir surface at top of the gates. Two of the

(Continued on p. 172)

Accounting Procedure in the Bureau of Reclamation as Affected by Recent Legislation[1]

By William F. Kubach, Chief Accountant

RECENT legislation necessitates material changes in the set-up of the financial accounts of each project. The contracts made with water users' organizations are very dissimilar and it is impossible to devise a standard uniform accounting procedure to be followed as was done under the extension act of August 13, 1914. The financial accounts for each project must be arranged to reflect the transactions peculiar to the respective projects.

The most recent legislation which requires a change in procedure is the appropriation act for the fiscal year 1928. Where the care, operation, and maintenance of a project or a division of a project have been or will be assumed by the water users' organization in the near future, and the contract with that organization provides for advance payment of the entire or a pro rata share of the cost of operation and maintenance of the entire irrigation system or reserved works, only partial or no appropriation has been made, it being the theory of Congress that operation and maintenance should be financed as far as possible by funds advanced. The act provides that any moneys that have been heretofore or may be hereafter advanced for operation and maintenance of any project or any division of a project shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which advanced in like manner as if such funds had been appropriated specifically for that purpose.

This requires the financing from advance funds of the purchase of all material and supplies, equipment, etc., necessary for operation and maintenance. The practice of charging to operation and maintenance costs materials and supplies as used and depreciation of plant and equipment must be materially changed especially where the operation and maintenance of a project is being financed entirely by advanced funds, and the water users' organization agrees to assume the book values of inventories and plant and equipment when the operation and maintenance is assumed at a later date. Apparently all purchases made from advanced funds must be ear-marked to distinguish them from items purchased with Government funds, to enable the correct determination of the liability assumed by the districts, while materials and supplies and equipment purchased with Government funds must be properly accounted for and charged against the funds advanced as used.

INCREASE IN FUND ACCOUNTING

The appropriation act for 1928 carries separate items for specific purposes. This will greatly increase our fund accounting so as to guard against exceeding the limitations stated for the separate items under each project. Greater care must be exercised to see that the moneys appropriated are expended for the purposes authorized. Expenditures for the purposes enumerated for each project can exceed the amount only by invoking the 10 per cent interchange provision of the act. Moneys specifically appropriated for the drainage system can not be diverted to operation and maintenance or other features of the same project except on prior authority for such interchange.

The appropriation act for 1928 carries a separate item for the Washington office, and it will be unnecessary in 1928 to reserve from each project's appropriation a percentage to provide an allotment of funds for that office.

The fact finders' act and the adjustment act require sweeping changes in our accounts. The funding of so large an amount of delinquent charges, interest, and penalties into the construction indebtedness changes entirely the construction and the operation and maintenance groups. It is no longer possible to compare the value of water-right contracts with the net construction cost, as many items used in the determination of the net construction cost will be, under subsections I and J, a direct credit to the water users' accounts, and the construction group set-up must be changed. Many new accounts must appear in this group to determine properly the indebtedness of the water users. The terms "Net construction costs" and "Net operation and maintenance costs" have become obsolete. In order to reflect the results of the adjustment act the charge-offs must be recorded. Many, no doubt, have considered the items appearing in the adjustment act as the final determination of such charge-off. This, however, is not true. The charge-offs must be determined from the individual water-right contract values, where the permanently unproductive lands are covered by water-right application, and

[1] Address at Denver Conference, March, 1928.

McKay Dam Construction

(Continued from p. 171)

radial gates are automatic, being controlled by float switches located in wells in the adjacent piers. The gate-operating mechanism is located directly over the gates on a reinforced concrete deck.

The spillway excavation of 31,000 cubic yards of rock was drilled with jack hammers, shot, moved to the lower end of the spillway with a power-operated drag bucket, and loaded into 4-yard dump cars and placed in the rock drain at the downstream toe of the embankment.

CONCRETE AGGREGATES

Sand for concrete was not available at the dam site and was shipped by railroad from Hermiston, a distance of 42 miles, and hauled by truck 2½ miles. The cost at the mixer was $2.50 per cubic yard. Gravel for concrete was obtained about 1 mile above the dam. The cost of excavating, screening, washing, crushing, and hauling to the mixing plant was estimated at $1.80 per cubic yard.

Extensive tests were made by the Bureau of Standards in Denver on various available aggregates for concrete before the decision was reached to use local gravel and Hermiston sand. All sands in this region are rather fine and very poorly graded. The resulting mixed aggregate was deficient in coarse sand and pea gravel. This deficiency was later corrected to a certain extent by the addition of local aggregates selected for this purpose.

The accompanying drawing shows the general plan and sections through the spillway, outlet works, maximum section, and various details. The tabulated cost gives the actual construction quantities, unit costs, and both the estimated and actual total cost. (See back cover page.)

whether or not the landowner accepts the land classification.

Where contracts have been made for joint liability, and the charges are to be collected through irrigation district assessments or taxes, it is impossible to maintain individual repayment records. In fact, it is the plan of the contracts that the United States will withdraw completely from such work. After the district has been assisted in establishing financial records, and the individual must look to the district for the status of his account, it is planned to divorce the repayment accounts from the projects, billing and collecting the accounts in the Washington office. This plan must be followed where a project has been completely turned over, and it does not seem that the repayment books are essential to a project office where only reserved works are being operated and maintained by the bureau.

We are working on a new form of financial statement to carry many new accounts. We are also working on a standard classification of accounts for the irrigation districts and associations to be submitted to the bureau in order that we may be kept informed as to their financial standing.

SUSPENSION OF CHARGES

The procedure heretofore followed in handling suspensions of charges against temporarily unproductive lands must be changed. The regulations now in effect provide that in the case of temporary suspensions the installments of construction charges will be collected thereafter upon the remaining irrigable area and shall be computed upon the basis of the portion of the construction charges unpaid less the total construction charge on the area temporarily eliminated, and that whenever the total amount paid by a water-right applicant shall equal the amount of the construction charge on the total irrigable area, less the eliminated area, further collections of water-right construction charges from such applicant shall be suspended.

Under this procedure it is plain that the payments theretofore made for temporarily suspended land are diverted to the benefit of charges against the productive area. This is not contemplated by the adjustment act. The theory is that construction charges unpaid and unaccrued, together with the payments heretofore made, will be placed in suspense. That is, the debits as well as the credits are suspended. The procedure heretofore in effect has also resulted in the water-right applicant paying annual installments on an erroneous base rate. The whole procedure is mathematically incorrect and not in harmony with the adjustment act.

FISCAL RELATIONS OF THE WATER USERS' ORGANIZATION

It is apparent where a water users' organization has been designated a fiscal agent of the United States for the collection of construction charges from nonconsenting land owners and for the collection of other amounts due or to become due to the United States, that the fiscal relations of the organization to the United States are not fully understood. The fact that the water users' organization has assumed joint liability of the construction indebtedness of the nonconsenting lands and will itself make payment if the nonconsenting landowner fails or refuses to make payment, does not relieve the organization from the proper accountability under its bond as fiscal agent of the United States. It is expected that the moneys so collected will be turned over to the United States within a reasonable time, and failure to do so will be sufficient cause for action under its surety bond. Moneys so collected can not be withheld and diverted to other uses, on the assumption that the United States is amply protected by the joint liability provision of the contract.

The water users' organization, although designated a fiscal agent of the United States by its contract, should not be permitted to make collection of moneys due the United States until surety bond has been furnished and accepted by the department. After the bond has been accepted, instruction will issue for accounting for moneys collected as such fiscal agent.

The limited time allotted makes it impossible to cover all the changes in accounting procedure that are necessary. A few of the more important changes only have been discussed.

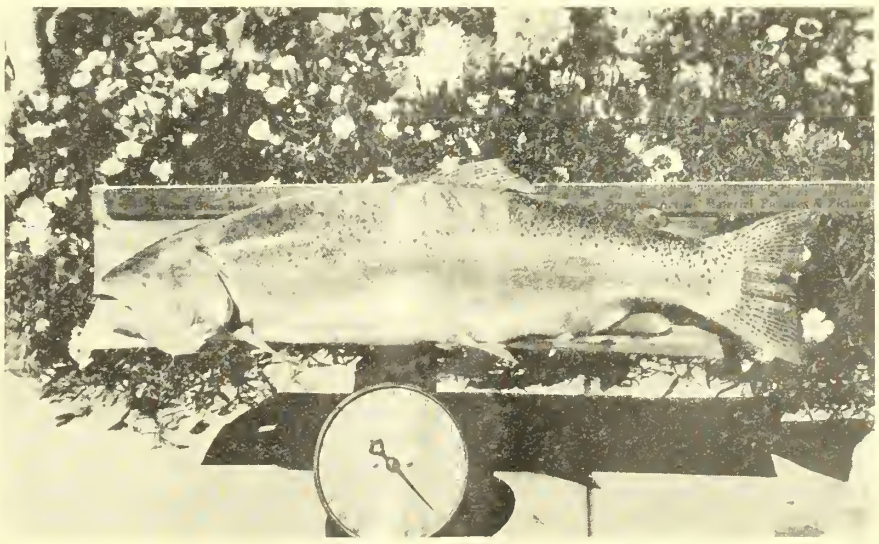
Interior Department Buys Shoshone Honey

Forty employees of the Department of the Interior, from the Secretary's office, the National Park Service, and the Bureau of Reclamation, in Washington, D. C., have sent an order to Mr. H. F. Krueger of Powell, Wyo., a water user on the Shoshone irrigation project, for 260 pounds of honey. This opportunity to obtain an excellent grade of honey at an attractive price resulted from the recent visit to the project by Mr. Kreutzer, Director of Reclamation Economics, who passed the word along to the employees of the Bureau of Reclamation on his return to the Washington office.

The office is open to suggestions for the purchase of other products from our projects.

Reservoir for Project Stocked with Fish

One hundred and eighty-seven cans of fish were received at the Elephant Butte Dam, Rio Grande project, New Mexico-Texas, on September 23 from LaCrosse, Wis. The shipment consisted of black bass, sunfish, ring perch, and crappie, which were placed in the reservoir. Twelve cans of catfish received at the same time and 12,000 fingerling trout from the New Mexico State hatchery were placed in the Rio Grande below the dam. The State game warden of New Mexico received the shipments and supervised the distribution of the fish.



Nine-pound rainbow trout caught in Pishkun reservoir, Sun River project, Mont.

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, under the authority of the Commissioner of Reclamation and the Secretary of the Interior.

The NEW RECLAMATION ERA is sent monthly to water users on the reclamation projects under the jurisdiction of the bureau. To other than water users the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation. Subscriptions should be sent to the Chief Clerk, Bureau of Reclamation, Washington, D. C.

Increased Irrigation Development in Egypt

THE new barrage at Nag Hammadi forms the next step in the irrigation development of the Nile, which commenced in 1899 with the construction of the Assouan Dam, followed by the Esna Dam built in 1908, and the Sennar Dam opened in January, 1926.

The site for the proposed barrages which will be over half a mile in length, is situated some 500 miles up the river between the existing barrages of Assiut and Esna. The object of the barrage is to raise the level of the river sufficiently to irrigate an area of approximately 500,000 acres at all seasons of the year, formerly only possible at a time of high flood.

This will enable two crops per year to be grown instead of one, and also avoid risks of incomplete irrigation, due to low levels and consequent failure of crops.

Roller-type gates will be fitted to the 100 openings in the main barrage and six openings in the irrigation canal. Each opening is provided with two gates of 6 meters span running in parallel grooves, which will permit their being lifted out separately if desired. These gates have a depth of 6.1, 7.1, and 8.1 meters, respectively, according to their position on the barrage. Two power-driven machines traveling on rails on top of the barrage will be provided for operating the gates to regulate the flow of water through the openings and for removing the gates when necessary. A small machine will work on the canal head for the regulation of the gates controlling the flow of water into the canal. The contract price of these gates approximates $850,000.

Construction Work at Gibson Dam Sun River Project, Montana

By Ralph Lowry, Construction Engineer

CONCRETE aggregate is obtained from a natural deposit located on the right bank of the north fork of Sun River, about 1,500 feet downstream from Gibson Dam. The pit-run material is excavated by a Bucyrus 50-B steam shovel, loaded into 4-yard cars, and hauled by an 18-ton dinkey to the gravel plant, which is located on the right bank of the river, about midway between the gravel pit and the dam. At the gravel plant the pit-run material is dumped over a grizzly, the oversize rock passing through a jaw crusher onto a conveyor belt which travels beneath the grizzly. The crushed oversize, together with the material passing through the grizzly, is carried by the belt and discharged into the screening plant, where, with the addition of water, the material is washed and segregated into the various sizes.

The sand is carried down by the water into an auxiliary sand washer located underneath the screen. The four sizes of aggregate, including the sand, are then carried by belt conveyors and dumped into the various stock piles which are located on a line between the screening and mixing plants. On the way to the stock pile material is taken from the coarse rock conveyor and put through a Symons cone crusher for producing sand to supplement the supply of natural sand which is deficient. The product from the cone crusher is elevated by bucket conveyor and is run over a Hummer screen, the oversize from which falls onto the pea gravel belt conveyor, the sand passing through the screen and onto the stock pile directly below. A tunnel extends underneath all the stock piles, through which a belt conveyor travels which runs up an incline to the top of the mixing plant. This plant is located about 300 feet toward the dam from the end of the stock pile. Release of material from the stock piles is controlled by manually operated gates in the tunnel. The aggregate, after passing through the gates and onto the conveyor, is transported to the top of the mixing plant, where it is dropped into the proper storage bin.

The various sized aggregate is released with one operation, by a manually controlled mechanism, from the storage bins into the measuring bins, directly below, and from the measuring bins the aggregate is dropped in the mixer hopper underneath. The cement is dumped into the mixer hopper by means of a chute, after being transported by a belt conveyor, from the 60-car capacity cement warehouse, located nearby, to a floor of the mixing plant, adjacent to and on the same elevation as the storage bins. All material for one batch is dumped from the hopper into the 2-yard, motor operated, Smith tilting mixer. The mixing plant contains two separate mixers with auxiliary hoppers, measuring bins, etc. The concrete, after being mixed, is dumped into 2-yard concrete cars and hauled by 7-ton gas dinkeys to the dam, where the concrete is elevated and distributed by means of tower and chutes.

An Advertising Hint

The Fallon Eagle, formerly the Churchill County Eagle, now carries as its main front page heading a reproduction of a sketch of the Lahontan Dam, Newlands project, drawn by J. Malm, an artist who is the owner of a farm in the Lone Tree district. Mr. Malm takes a great deal of interest in the development of the project's resources and in bringing them to the attention of outsiders. Commenting on the heading the Eagle says:

"When other communities have suffered for lack of water for irrigation, storage of flood waters in the Lahontan Reservoir has afforded ample supply for all crops. This year there is almost enough water to take care of next year's crops."

The exercise of selection, wisely and judiciously pursued, gives the breeder an important advantage over others who leave the mating of their animals largely to chance.

Reclamation Organization Activities and Project Visitors

DR. ELWOOD MEAD, Commissioner of Reclamation, returned to the Washington office on October 5 after a two months' trip to Palestine for a study of the colonization work of the Zionist organization.

R. F. Walter, chief engineer, spent a week at Albuquerque, N. Mex., with the consulting board of the middle Rio Grande conservancy district, going over the plans of the district which proposes to irrigate lands in the Rio Grande Valley between White Rock Canyon and San Marciel.

George C. Kreutzer, director of reclamation economics, and S. L. Jeffords, special investigator, left the Washington office on October 12 for a trip to a number of the Southern States to investigate properties suggested by the respective States in connection with the study now being made by the bureau of opportunities for planned group settlement in the South.

The temporary appointment of James J. Doland, assistant engineer in the designing section, Denver office, has been terminated to enable him to return to his position on the teaching staff of the College of Engineering, University of Illinois.

Alfred C. Jaquith, formerly employed as an engineer in the designing section of the Denver office, died in Mexico City on September 23.

J. G. Teicher, secretary of the thirteenth civil service district, and Superintendant Nusbaum, of the Mesa Verde National Park, spent several days on the Uncompahgre project, during which they conducted an examination for park ranger, inspected the project, and visited the Western Slope Fair.

B. H. Creighton, of the Department of Commerce, was in Burley, Minidoka project, for several days surveying landing fields and making arrangements for beacon lights on the air-mail route.

Recent visitors on the Milk River project included Senators Walsh and Wheeler, W. H. Wattis, W. Y. Cannon, and David Scott, of the Utah-Idaho Sugar Co.; and C. D. Greenfield, agricultural development agent of the Great Northern Railway Co.

A party of irrigation officials from Canada visited the Sun River project recently and inspected the distribution system and the development of the irrigable lands. The party included L. C. Charlesworth, chairman, irrigation council, Edmonton, Alberta; P. M. Sanders, project manager, Lethbridge northern irrigation district, Lethbridge; G. F. Hilliard, water master, Picture Butte; C. S. Clendenning, water master, Commerce; A. J. Branch, water master, Monarch; W. R. Brookes, water master, Macleod; and C. Asplund, project manager, United irrigation district Glenwoodville.

A recent press dispatch from Salt Lake City states that Dr. John A. Widtsoe, former member of Secretary Work's fact finding committee on the reclamation projects, has been named head of the European mission of the Church of Jesus Christ of Latter-day Saints, succeeding Dr. James E. Talmage. Doctor Widtsoe's headquarters are stated to be in London.

Val Kuska, colonization agent of the Chicago, Burlington & Quincy Railroad, and R. A. Smith, supervisor of agriculture of the Union Pacific system, were on the North Platte project recently in connection with settlement matters.

Associate Engineer D. C. Caylor has been placed in charge of the remaining construction work in the Elephant Butte irrigation district, Rio Grande project, and Assistant Engineer M. W. Bushman transferred to the El Paso Valley district where he will assume charge of the remaining construction work in that district.

Automobiles Increase In Yakima County

During the first 11 days of August 585 automobile licenses were issued by the auditor's office of Yakima County, Wash., in which the Yakima irrigation project is located. In addition, 165 transfers were granted. Licenses issued up to August 12 totaled 21,310, or 1,130 more than had been issued up to the corresponding date last year.

A conference was held at Klamath Falls, Klamath project, by Hon. Paul G. Redington, Chief of the Bureau of Biological Survey, with Ray Steel, Federal game warden for Oregon; L. T. Jessup, associate drainage engineer, Department of Agriculture; and others relative to the situation on Lower Klamath Lake affecting bird life.

E. K. Humphrey, of the Oregon State engineer's office, spent two days on the Klamath project conducting tests of the pumping plants of the Malin and Shasta View irrigation districts.

Dr. F. L. Ransome, geologist, was on the Owyhee project for a number of days making a geological examination of the reservoir and dam site.

S. O. Harper, superintendent of construction, made an inspection of needed repairs on canals on the Belle Fourche project and conferred with Drainage Engineer Iakisch on the location and construction of the drainage work for 1928.

J. C. McDonald, comptroller of water rights in the department of lands, Victoria, British Columbia, visited the Okanogan project to obtain information relative to reclamation on this side of the line.

D. J. Calkins, of the Tacoma office of the Geological Survey, spent a day on the Yakima project checking gauging stations maintained by the bureau and obtaining stream flow data.

Congressmen Louis C. Cramton, Burton L. French, Edward T. Taylor, and Charles E. Winter, and Gov. Frank C. Emerson, of Wyoming, visited the Riverton project on September 30.

Porter J. Preston, superintendent of the Yuma project, and Charles A. Engle, supervising engineer, Indian irrigation service, who, with Ray P. Teele, who died recently, have been making a survey of irrigation methods and practices on reclamation and Indian irrigation projects, are spending some time in the Washington office in connection with their report.

John S. Moore, assistant engineer on the Yakima project visited the Washington office recently.

STATEMENT OF ACCRETIONS TO THE RECLAMATION FUND AND EXPENDITURES BY THE FEDERAL GOVERNMENT FOR CONSTRUCTION AND OPERATION OF RECLAMATION PROJECTS, INCLUDING PROPOSED 10-YEAR PROGRAM TO COMPLETE PROJECTS UNDER CONSTRUCTION (COLUMN 4), BY STATES, JUNE 30, 1927

(1) State and projects	(2) Accretions to reclamation fund to June 30, 1927	(3) Expended for construction of reclamation projects to June 30, 1927	(4) Estimate to complete under 10-year program	(5) Actual and estimated final construction cost (total of columns 3 and 4)	(6) Expended for operation and maintenance to June 30, 1927	(7) Total expenditures for construction and operation and maintenance (total columns 3 and 6)
Arizona:						
Salt River	$2, 269, 736. 56	$15, 106, 942. 10		$15, 106, 942. 10		$15, 106, 942. 10
Yuma [1]		8, 392, 971. 90	$1, 291, 000. 00	9, 683, 971. 90	$2, 477, 050. 85	10, 870, 022. 75
Total Arizona		23, 499, 914. 00	1, 291, 000. 00	24, 790, 914. 00	2, 477, 050. 85	25, 976, 964. 85
California:						
Orland	13, 677, 933. 85	1, 634, 478. 64	727, 000. 00	2, 361, 478. 64	334, 845. 39	1, 969, 324. 03
Yuma [1]		1, 593, 194. 59		1, 593, 194. 59	743, 115. 26	2, 336, 309. 85
Klamath [1]		1, 795, 887. 41	1, 581, 000. 00	3, 376, 887. 41	23, 469. 17	1, 819, 356. 58
Total California		5, 023, 560. 64	2, 308, 000. 00	7, 331, 560. 64	1, 101, 429. 82	6, 124, 990. 46
Colorado:						
Grand Valley	10, 076, 128. 83	5, 280, 260. 58	136, 000. 00	5, 416, 260. 58		5, 280, 260. 58
Uncompahgre		7, 928, 760. 97	500, 000. 00	8, 428, 760. 97	635, 118. 86	8, 563, 879. 83
Total Colorado		13, 209, 021. 55	636, 000. 00	13, 845, 021. 55	635, 118. 86	13, 844, 140. 41
Idaho:						
King Hill	6, 973, 822. 57	1, 904, 898. 80		1, 904, 898. 80	156, 734. 25	2, 061, 633. 05
Minidoka		7, 122, 208. 47	325, 000. 00	7, 447, 208. 47	1, 886, 428. 64	9, 008, 637. 11
American Falls		7, 543, 266. 63	3, 479, 000. 00	11, 022, 266. 63		7, 543, 266. 63
Gravity extension unit		18, 835. 09	4, 981, 164. 91	5, 000, 000. 00		18, 835. 09
North side extension			5, 169, 000. 00	5, 169, 000. 00		
Boise [1]		14, 988, 233. 38	6, 334, 000. 00	21, 322, 233. 38	2, 623, 152. 05	17, 611, 385. 43
Owyhee [1]		62, 264. 27	5, 937, 735. 73	6, 000, 000. 00		62, 264. 27
Total Idaho		31, 639, 706. 64	26, 225, 900. 64	57, 865, 607. 28	4, 666, 314. 94	36, 306, 021. 58
Kansas: Garden City	1, 032, 764. 48	395, 831. 78		395, 831. 78		395, 831. 78
Montana:						
Huntley	15, 757, 830. 07	1, 499, 250. 67	60, 000. 00	1, 559, 250. 67	1, 002, 125. 26	2, 501, 375. 93
Milk River		7, 421, 095. 12	181, 000. 00	7, 602, 095. 12	76, 373. 56	7, 497, 468. 68
Sun River		4, 863, 790. 45	3, 653, 000. 00	8, 516, 790. 45	248, 879. 43	5, 112, 669. 88
Lower Yellowstone [1]		2, 088, 270. 19	300, 000. 00	2, 388, 270. 19	734, 064. 22	2, 822, 334. 41
Total Montana		15, 872, 406. 43	4, 194, 000. 00	20, 066, 406. 43	2, 061, 442. 47	17, 933, 848. 90
Nebraska: North Platte [1]	2, 088, 546. 91	15, 047, 363. 94	707, 000. 00	15, 754, 363. 94	2, 579, 155. 18	17, 626, 519. 12
Nevada: Newlands	954, 162. 32	7, 688, 013. 34	1, 164, 000. 00	8, 852, 013. 34	1, 452, 926. 96	9, 140, 940. 30
New Mexico:						
Carlsbad	5, 989, 951. 30	1, 463, 265. 57	1, 001, 000. 00	2, 464, 265. 57	671, 247. 20	2, 134, 512. 77
Rio Grande [1]		8, 416, 798. 56	750, 000. 00	9, 166, 798. 56	939, 838. 12	9, 356, 636. 68
Hondo		381, 573. 39		381, 573. 39		381, 573. 39
Total New Mexico		10, 261, 637. 52	1, 751, 000. 00	12, 012, 637. 52	1, 611, 085. 32	11, 872, 722. 84
North Dakota:						
Buford Trenton	12, 227, 913. 28	223, 423. 06		223, 423. 06		223, 423. 06
Williston		517, 630. 09		517, 630. 09	979, 443. 11	1, 497, 073. 20
Lower Yelowstone [1]		1, 087, 323. 17	160, 000. 00	1, 247, 323. 17	382, 210. 69	1, 469, 533. 86
Total North Dakota		1, 828, 376. 32	160, 000. 00	1, 988, 376. 32	1, 361, 653. 80	3, 190, 030. 12
Oregon:						
Umatilla	11, 741, 729. 84	5, 157, 624. 17		5, 157, 624. 17	678, 811. 02	5, 836, 435. 19
Klamath [1]		3, 579, 880. 53	250, 000. 00	3, 829, 880. 53	877, 080. 59	4, 456, 961. 12
Vale		117, 397. 37	2, 997, 602. 63	3, 115, 000. 00		117, 397. 37
Owyhee [1]		124, 528. 55	11, 589, 471. 45	11, 714, 000. 00		124, 528. 55
Boise [1]		483, 210. 00		483, 210. 00	67, 109. 75	550, 319. 75
Total Oregon		9, 462, 640. 62	14, 837, 074. 08	24, 299, 714. 70	1, 623, 001. 36	11, 085, 641. 98
South Dakota: Belle Fourche	7, 773, 550. 98	3, 566, 124. 41	1, 180, 000. 00	4, 746, 124. 41	1, 271, 715. 37	4, 837, 839. 78
Texas: Rio Grande [1]		6, 756, 195. 58	420, 000. 00	7, 176, 195. 58	815, 326. 11	7, 571, 521. 69
Utah:						
Strawberry Valley	4, 011, 593. 63	3, 519, 935. 39		3, 519, 935. 39	437, 856. 39	3, 957, 791. 78
Salt Lake Basin		54, 848. 50	12, 345, 151. 50	12, 400, 000. 00		54, 848. 50
Total Utah		3, 574, 783. 89	12, 345, 151. 50	15, 919, 935. 39	437, 856. 39	4, 012, 640. 28
Washington:						
Okanogan	7, 345, 256. 13	1, 465, 097. 27	320, 000. 00	1, 785, 097. 27	603, 070. 18	2, 068, 167. 45
Yakima		14, 416, 976. 88	18, 879, 000. 00	33, 295, 976. 88	3, 413, 458. 21	17, 830, 435. 09
Kittitas		557, 464. 06	8, 442, 535. 94	9, 000, 000. 00		557, 464. 06
Total Washington		16, 439, 538. 21	27, 641, 535. 94	44, 081, 074. 15	4, 016, 528. 39	20, 456, 066. 60
Wyoming:						
Riverton	32, 653, 132. 94	2, 843, 489. 47	5, 195, 000. 00	8, 038, 489. 47		2, 843, 489. 47
Shoshone		9, 427, 434. 57	5, 193, 000. 00	14, 620, 434. 57	856, 969. 31	10, 284, 403. 88
North Platte [1]		4, 776, 764. 34		4, 776, 764. 34	74, 091. 56	4, 850, 855. 90
Total Wyoming		17, 047, 688. 38	10, 388, 000. 00	27, 435, 688. 38	931, 060. 87	17, 978, 749. 25
All States: Secondary		2, 574, 438. 29		2, 574, 438. 29		2, 574, 438. 29
Miscellaneous accretions:						
Alabama	46, 653. 97					
Louisiana	10, 062. 16					
Oklahoma	5, 926, 039. 19					
Federal water power licenses	31, 442. 41					
Grand total	140, 588, 251. 42	183, 887, 241. 54	105, 248, 662. 16	289, 135, 903. 70	27, 041, 666. 69	210, 928, 908. 23

[1] Interstate project—expenditures for construction and operation and maintenance prorated on area basis.

U. S. GOVERNMENT PRINTING OFFICE: 1927

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards**, Assistant Secretary; **E. O. Patterson**, Solicitor of the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — P. W. Dent, Assistant Commissioner — George C. Kreutzer, Director of Reclamation Economics

W. F. Kubach, Chief Accountant — C. A. Bissell, Chief of Engineering Division — Hugh A. Brown, Assistant Director of Reclamation Economics

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilde Building

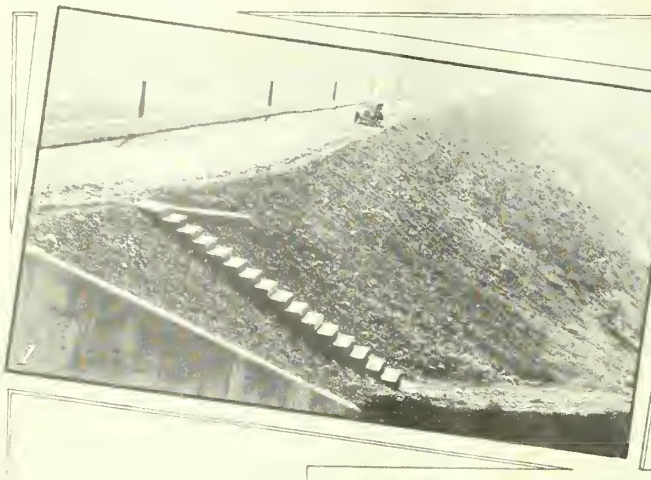
R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Cadeu, Fiscal Agent.

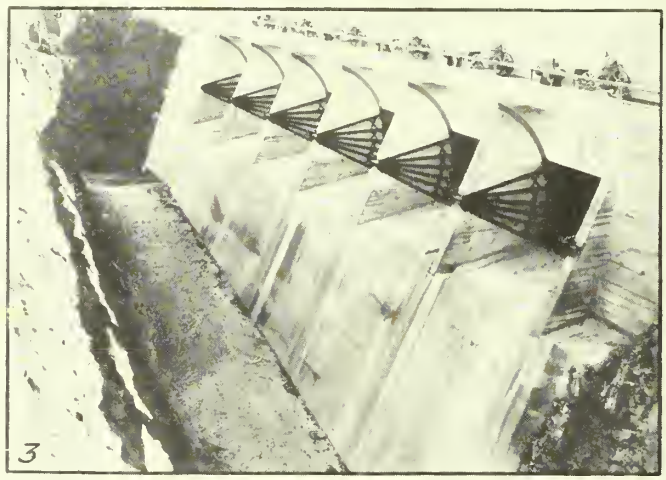
Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	Portland, Oreg.
Carlsbad	Carlsbad, N. Mex.	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont.	H. M. Schilling	J. P. Siebeneicher		E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg.	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif.
Lower Yellowstone	Savage, Mont.	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont.	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev.	A. W. Walker	Erle W. Shepard	Miss E. M. Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr.	H. C. Stetson	Virgil E. Hubbell	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash.	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif.	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Owyhee	Nyssa, Oreg.	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex.	L. R. Fiock	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo.	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson				
Salt River [6]	Phoenix, Ariz.					
Shoshone [7]	Powell, Wyo.	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley [8]	Provo, Utah					
Sun River [9]	Fairfield, Mont.	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [10]	Hermiston, Oreg.					
Uncompahgre	Montrose, Colo.	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg.	H. W. Bashore	C. M. Voyen		B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash.	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz.	P. J. Preston	H. R. Pasewalk	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.
Large Construction Work						
North Platte, Guernsey Dam.	Guernsey, Wyo.	F. F. Smith [11]		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash.	Walker R. Young [12]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam.	Augusta, Mont.	Ralph Lowry [12]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [12]	C. B. Funk		R. J. Coffey	Berkeley, Calif.

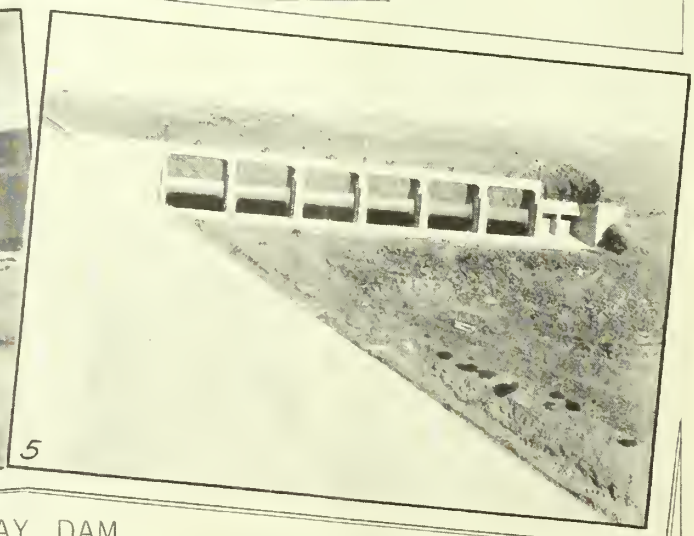
[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.
[2] Operation project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District and Gering and Fort Laramie Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926
[9] Operation of Fort Shaw Division assumed by Fort Shaw Irrigation District on Dec. 31, 1926.
[10] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District informally on July 1, 1926, and formally, by contract, on Dec. 31, 1926.
[11] Resident engineer.
[12] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Cache la Poudre investigations	Denver, Colo.	Thomas Hawthorne	Poudre Valley Water Conservation Association.
Middle Rio Grande	Albuquerque, N. Mex.	C. C. Elder	Middle Rio Grande conservancy district.
Yakima project extensions	Yakima, Wash.	J. L. Lytel	
Columbia Basin Project	Lind, Wash.	B. E. Hayden	
Truckee River	Reno, Nev.	A. N. Burch	
Heart Mountain investigations	Powell, Wyo.	I. B. Hosig	
Southern investigations	Washington, D. C.	C. A. Bissell	States of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee.







McKAY DAM

UMATILLA PROJECT, OREGON

1. DOWNSTREAM SLOPE OF EMBANKMENT FROM ACROSS SPILLWAY
2. LOOKING SOUTHWEST ACROSS DAM
3. DOWNSTREAM VIEW OF RADIAL GATES
4. SPILLWAY, VALVE HOUSE, AND TOWER SLOPE OF EMBANKMENT
5. RADIAL GATES AND SIPHON SPILLWAYS

See page 170

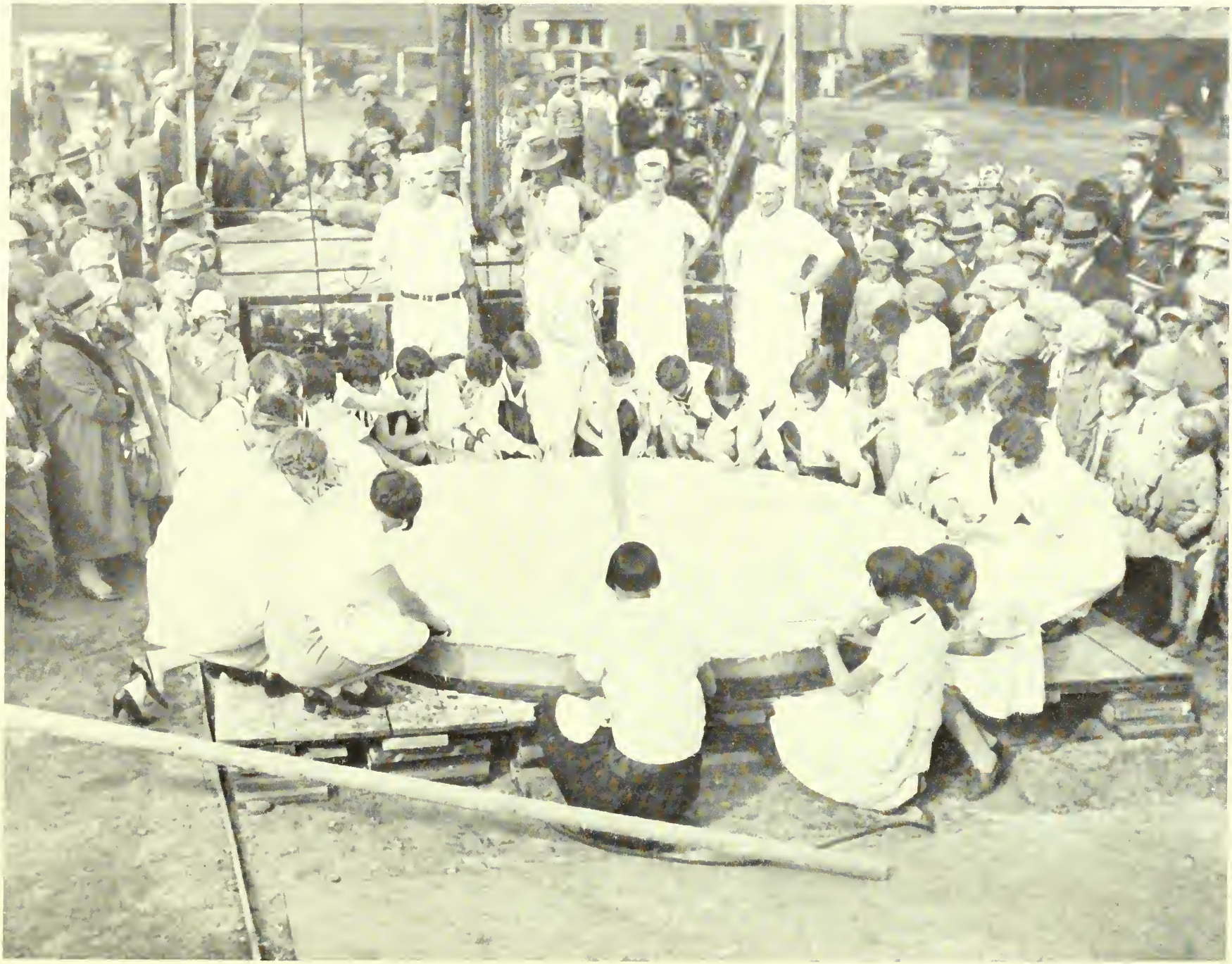
I 27.5: 1927

NEW RECLAMATION ERA

VOL. 18 DECEMBER, 1927 NO. 12

WINTER'S SNOWS, THE SOURCE OF THE PROJECT WATER SUPPLY

Government Publications



YAKIMA'S $1,000, ONE-TON APPLE PIE (SEE PAGE 187)

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.
Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 18 DECEMBER, 1927 No. 12

Interesting High Lights on the Reclamation Projects

PRESIDENT Coolidge received by air mail the first sack of sugar produced this year at the Fallon sugar factory, Newlands project, Nevada. The sack was purchased at $1 a pound by George Wingfield, prominent banker and mining man, who came to Fallon from Reno for the opening of the factory.

THE owners of all lands on the Vale project, Oregon, now owned or formerly owned by the Oregon & Western Colonization Co. and the Eastern Oregon Land Co. have executed the "excess" land contracts and "incremated value" contracts for excess land and the "incremated value" contracts for nonexcess land.

WORK was pushed at Stony Gorge Dam, Orland project, to complete the foundations and buttresses within the cofferdam on the north channel of the creek up to an elevation that would be reasonably safe from winter floods.

SIX and one-half acres on the Milk River project yielded 15 tons of sugar beets per acre. On the Malta and Glasgow divisions 5,979 tons have been harvested from 600 acres, or an average of 9.9 tons per acre. The sugar content averaged 18¼ per cent, with a few beets running as high as 20 per cent.

THE Chinook sugar factory, Milk River project, had sliced 15,000 tons of beets at the end of the month and manufactured 45,000 sacks of sugar. Operations closed about the middle of November.

CONTRACTS were being signed for the 1928 beet crop on the Lower Yellowstone project, providing for $6 minimum if the tonnage is less than 50,000; $6.50 if less than 60,000; and $7 for 70,000 tons or more. Under the sliding scale agreement additional bonuses will be paid if warranted by the sugar content and the price of sugar.

THE returns to growers of sugar beets on the Minidoka project promise to be very gratifying. Estimates by sugar company officials place the average yield at about 13 tons per acre. About 4,000 acres were grown on the project. The base price is $7.50 a ton with such bonuses as may be justified by the sugar market. The best yield reported at the end of the month was that of Tom Bell, who harvested 275 tons of beets from 10 acres.

NUMEROUS instances of returns of around $100 per acre on alfalfa and clover seed have been reported by Minidoka project farmers. From 9 acres Thomas Anderson threshed 10,782 pounds of alfalfa seed, or an average of about 20 bushels per acre. William Schoenfeldt got 14,000 pounds of alfalfa seed from 13¾ acres, or about 17 bushels per acre. The seed was sold at 14½ cents a pound straight from the machine. Four Paul men gathered 3,150 pounds of alfalfa seed from roadsides and ditch banks, netting $521, equivalent to a wage of $9 per day each for their time.

EQUIPMENT for the manufacture of casein has been installed at the Burley plant of the Mini-Cassia Cooperative Dairymen's Association, Minidoka project. This produce is made from whole milk which the association began receiving from the farmers on November 1. Casein has many uses and finds a ready market. Some of the processes in which it may be utilized are the manufacture of paints, enamels, glue, cements, putty, imitation ivory, linoleum, fruit sprays, soap, etc., and in softening fibers, color printing, waterproofing, and photography.

SEVERAL water users on the Grand Valley project have purchased small bands of sheep, ranging from 100 to 300 head. This is considered an encourgaging sign, as it seems certain that the practice of feeding the farm crop will result in an increased revenue to the grower.

IT is understood that the Kraft Cheese Co. contemplates the early opening of a cheese factory on the Uncompahgre project. A representative of the company was very much impressed with the natural dairy facilities in the valley and stated that a factory would be started if 5,000 cows could be guaranteed. It is estimated that 15,000 cows will be available, and that if the industry is started more cows will be brought into the project.

THE Potato Growers' Association on the Klamath project has made arrangements with radio station KGW, of Portland, Oreg., to broadcast a 50-word message for six nights, advertising Klamath County's second annual potato show.

ABOUT 5,000 head of cows and calves are being pastured in the valley division, Yuma project, and being fattened for shipment to the Los Angeles market. Pasturage is mainly alfalfa, barley, and Sudan grass. Rates for pasturing are 7 cents a day per head for cows and 5 cents for yearlings.

SIX hundred acres of citrus trees on the Yuma Mesa will bear fruit this year, or approximately 66 per cent of the total acreage in unit B. The yield has been estimated at 10,000 to 12,000 boxes, or 250 to 300 tons of fruit. This crop, figured on a basis of 80 trees to the acre, will give an average yield of ¼ box per tree. Prices are expected to average 4 cents a pound, giving a return on the season's crop of $20,000 to $25,000.

OVERHAULING of the upper tier of balanced valves at Arrowrock dam, Boise project, showed that the difficulty in operation during the past two or three years was due to corrosion of the bronze surfaces on the inside of the cylinders and the outside of the pistons. After a thorough cleaning they operated as easily as when first installed.

Economic Notes from the Reclamation Projects

Development and Settlement of Reclaimed Land[1]

By J. L. Lytel, Superintendent, Yakima Project, Washington

UNTIL a few years ago the development of an irrigation project was thought to consist mainly of investigation as to the area of land available, sufficiency of water supply, engineering feasibility, and the construction of the works necessary to put water on the land. The settlement feature was given very little attention when the Reclamation Service was started. As development of projects proceeded and those started first reached the settlement stage, and the time for collection of charges arrived, it became apparent that the settlement feature was one of major importance.

It was therefore decided that careful consideration should be given soil, economic, and settlement conditions. Consequently, there were included in the features to be investigated on all new projects, and on all new divisions of old projects, detailed reports on soil and economic conditions. Soil and economic reports were also made on the reclamation projects previously constructed, particularly where settlement problems of any consequence were involved.

On some of the projects that have been developed a great deal of the land was in private ownership, and the advantages accruing to the land by the construction of irrigation works with interest-free Government money were capitalized, and the price of land to the new settler was increased accordingly.

This worked a great hardship on the new settlers and delayed both the rate of development and the payment of construction charges. It was therefore apparent that the matter of settlement required careful attention from the beginning of the project, and some plan must be devised for the prevention or limiting of speculation in the land in order to make it possible for the new settler to purchase it at a reasonable price.

With the experience gained during the past 25 years, a great deal more is known concerning the obstacles and difficulties confronting the development of land by irrigation than when the original Federal irrigation act was passed in 1902. Also the social and economic conditions in the United States have undergone marked changes since that time which make it necessary to handle irrigation development under more complete and comprehensive plans than those followed in the past.

With the greatly increased investments in irrigation works, the matter of the result that is to be secured from the lands, that will enable the repayment of the charges, must be given very careful consideration in order to lessen the risk of the investment as much as possible. The work of developing new projects should, therefore, include every important feature from the investigation to successful settlement and the final payment of all charges to the Federal Government, State, or other agency furnishing any part of the funds for the construction of irrigation works, the clearing and leveling of land, settlement, and the establishment of a successful farm plant and home. The bringing together of the two essential elements on which irrigated agriculture is founded is only the first important step in the development of the possibilities and just a good start on the job. Also it represents only a portion of the investment necessary.

FACTORS TO BE CONSIDERED

After the irrigation water is on the land, many real problems remain, some of which are:

1. Clearing and leveling of farms, construction of farm buildings, etc.
2. Settlement.
3. Studies of the kind of crops that can be produced profitably, and expert advice to settlers.
4. Funds and credit for financing farm development.
5. Market for crops produced.

Unless the agency developing the project looks after these features and sees that they are properly provided for, they will retard the development of the project to the extent that the investment in the irrigation works will be jeopardized.

Farming has ceased to be a jumble of haphazard operations. It is a well-developed business, which is now receiving about as much attention as other big business of the Nation. On irrigation projects, settlers are needed with the right attitude toward farming. The expensive farm plant must be occupied by farmers who know something about farming and want to stay in the business and not by those who have had no experience in farming but feel they would like to try it for a while, with possibly the idea that in case they don't like it, or can not make a success, they can sell out at a high price, due to the advantages accruing to the land from the existing irrigation works. Gambling of this or any other nature in farms on irrigation projects must be eliminated in order to insure the success of the farmer and the return of the cost of the development.

Since the successful development of an irrigation project must depend on the settler who goes on the land, the settlement feature should be given its proper share of attention. In an irrigation district, all lands included within its boundaries are jointly obligated to pay the construction and operation costs, and the failure of any settler to pay his assessments puts an additional burden on the settler who does pay. Nonresident owners, even if they pay their charges, are undesirable on project lands, as they are not in a position to do their part in community building, which is a very necessary feature on any project.

It would appear, therefore, that the agency developing the project is obligated to see that all settlers who are allowed to go on the lands are so equipped with experience, funds, and a desire to farm, and that they have at least a fair chance to succeed.

Allow the settler who possesses the proper qualifications to purchase a piece of good land at a reasonable price, with sufficient water, well-constructed irrigation works, and a reasonable annual charge, together with good farmers as neighbors, and he has a fair chance to succeed in establishing a home on the land. I sometimes wonder what kind of a person they have in mind when they talk about a settler. Whom do the builders of a project have in mind they are building for? This question should be gone into and a decision reached along with other important problems.

INSURING SUCCESS

While the selection of settlers may primarily be for the purpose of insuring the success of the project from a financial standpoint, it may also be considered as an act on the part of the agency developing the project to discharge a duty it owes to every good settler who comes; namely, give them thrifty neighbors. It is an effort to insure the success of both the individual farmer and the community.

A farm may be considered as a factory that puts out certain articles for which there is assumed to be a demand, and an irrigation project is therefore made up

[1] Address delivered at the Oregon Irrigation Congress, Prineville, Oreg., October 13, 1927.

of a collection of factories or farms in which a very considerable amount has been invested, and these plants can not be run at a loss, or allowed to stand idle, without jeopardizing the investment in the project works.

The farmer is expected to become the owner, operator and manager of these plants, and the work of securing farmers is called settlement. Settlement may therefore be considered as an effort to interest the right kind of men in these farm plants, and it may be assumed that the nearer the development of the plants is to completion and the more desirable they are, the better the grade of settlers that can be interested and the sooner the project can be settled up. Surely, therefore, settlement is a major feature and the factors that enter into it must be given careful attention from the time the project is started.

From the long experience of Dr. Elwood Mead, Commissioner of Reclamation, and the results accomplished by the Bureau of Reclamation during the 25 years of its existence, a plan for the development and settlement of irrigation projects has been adopted and is being worked out which covers every feature from the preliminary investigation to the survey of the farm units and the securing of settlers.

A plan has also been worked out for handling the settlement problems that have been encountered on a number of the older projects on which construction has been completed, and is working out very satisfactorily. During the past year a large number of settlers have been secured for these projects, with gratifying results both from the standpoint of the progress of the individual settler and the progress of the project.

Some of our older projects that were in very poor condition economically a few years ago, mainly on account of the lack of a practical and businesslike settlement plan, are now going ahead at a rate that will put them in the class of well-founded going concerns in a few years.

THE KITTITAS DEVELOPMENT

The plan for the development of new projects is now being carried out in the development of the Kittitas division of the Yakima project and several other new projects, and is also working out satisfactorily.

A brief description of the Kittitas division, and a summary of the results accomplished, may be interesting.

The Kittitas division of the Yakima project includes an irrigable area of 72,000 acres located in the vicinity of Ellensburg, Washington, and is estimated to cost $9,000,000. The work of the bureau on the division to date covers the following features:

1. Investigation to determine feasibility, and estimates of cost.
2. Soil survey and classification of land by experts detailed to the work by the United States Department of Agriculture.
3. Investigation of economic conditions.

From the results shown in the reports made in connection with these three investigations, the project was found feasible.

A contract has been entered into with the Kittitas reclamation district providing for the construction of a canal system to convey water to the land. In addition to other important details, the contract contains provisions intended to limit speculation, and providing for the appraisal of the agricultural value of the land and the application of one-half of the difference between the appraised value and the sale price, if any, to the construction and operation and maintenance charges. This appraisal has been made with the following results:

The following schedule of land values was adopted after a careful study of all conditions:

(*a*) Lands improved and productive without irrigation, $30 to $70 per acre.

(*b*) Lands improved but nonproductive without irrigation, $10 to $30 per acre.

(*c*) Sage brush land in native condition:

	Per acre
Class 1	$8. 00
Class 2	5. 50
Class 3	3. 50
Class 5	3. 50–15. 00
Class 6	1. 00–3. 50

(*d*) Timber land: $1 to $3.50 per acre, with value of timber not considered.

The results of the land classification without deducting for canal rights of way are as follows:

		Acres
Productive land:		
Class 1		19, 852. 64
Class 2		36, 857. 11
Class 3		13, 299. 04
		70, 008. 79
Nonproductive land:		
Class 5	1, 102. 31	
Class 6	28, 039. 40	
		29, 141. 71
Total		99, 150. 50

The results of the appraisal show the value of project lands and improvements to be as follows:

Total value of lands	$1, 008, 569
Total value of improvements	940, 757
Total value of real estate	1, 949, 326

It is thought the valuations given eliminate the possibility of speculation in project lands, are fair to the present owner, and should insure the prospective settler against the failure which might occur from a too large initial capital investment in land. It is believed new settlers with even a fair chance to make good can pay these appraised prices, or considerably more, and succeed, as the more he pays for his land the less the water charges are.

PREVENTING SPECULATION

Paragraph 24 of the contract covers this provision and reads as follows:

(*a*) No part of the water supply provided through the irrigation works constructed under the provisions of this contract shall be delivered to or for any lands except the lands of the district whose owners, for themselves, their heirs, successors and assigns, have executed and delivered recordable contracts in a form to be approved by the Secretary, accepting the terms and conditions of this contract, and agreeing that their lands shall be bound by all the terms and conditions of this contract, and particularly the terms set out in this article; and the United States may reduce the amount of water provided to be delivered to the district to the extent of the water supply which would have been furnished to or for any lands not subscribed to such recordable contracts had they been subscribed.

(*b*) The value of the irrigable lands within the district boundaries shall be determined by a board of appraisers consisting of three members, one to be appointed by the Secretary, one by the district, and the two to select a third member. The board shall be appointed upon execution of this contract and shall at once make an appraisal of all district lands. In appraising said lands no speculative value shall be given thereto on account of the prospect or possibility of securing water through the said works proposed to be constructed by the United States, or on account of any claimed water supply from other source, but the same shall be appraised on the basis of such value as they would have without such prospect of water from said proposed works and without any supply from any other source.

(*c*) The United States shall not be obliged to make any expenditures under this contract until the appraisal above provided for is approved by the Secretary.

(*d*) The cost of said appraisal shall be paid for by the United States as part of the construction charge provided for herein.

(*e*) The owner or owners of the lands which after such appraisal are improved by the construction of buildings, fences, or other structures, or by leveling, ditching, clearing, or the seeding of grass, clover or alfalfa, or the planting of trees, or by the making of other improvements, may have such improvements or betterments so placed upon said lands after said appraisement, appraised by a board of appraisers selected in the same manner provided above, upon payment to the district of the estimated cost of making such appraisal of improvements, and thereupon such appraised value of such improvements shall be added to the appraised value of the land previously made, it being understood and agreed that improvements on the land at the time of the original appraisement will be included in the original appraised valuation of the land.

(*f*) Upon the sale of any land within the district, the vendor and vendee shall file with the secretary of the district a statement, executed by both under oath, describing the land and showing the amount of the purchase price of said land and giving the details of said transaction, and after any sale, transfer or trade of such land no water shall be furnished therefor until such statement, under oath, has been filed and the payment herein provided for made to the district to apply on the water right of said tract of land. It is understood and agreed that such land shall not be traded or transferred for other than a money consideration, nor upon an instalment contract, unless a sufficient cash payment be made to cover the payment to be made to the district as herein provided, and that any such trade or transfer for other than a money consideration, or without a sufficient cash payment to pay the amount provided herein to be paid to the district, shall immediately suspend the right of such tract of land to receive water from the works constructed by the United States until such land shall be reconveyed to the former owner or sold for a money consideration to another vendee and payment made to the district as herein provided.

(*g*) This contract shall be recorded in the office of the county recorder of Kittitas County and shall be notice to all landowners of the district and all future purchasers of land in the district that the right to receive water from any irrigation works constructed by the United States is conditional upon compliance with the terms and conditions herein set out.

(*h*) The appraised value of the land under the appraisement provided for above shall be considered a fair selling price, and if any of the lands of the district are sold at a price in excess of such appraised value, plus the appraised value of improvements and betterments hereafter placed on said land, plus the construction payment made to the United States on the cost of the water right for such tract of land (as a condition precedent to the transfer of title or the execution of a valid contract of sale), the vendor shall pay to the district, or the vendee shall pay to the district out of money which would otherwise have been payable to the vendor, an amount equal to 50 per cent of such excess.

(*i*) Such payment shall be credited on the books of the district to such tract of land so transferred as an advance payment of future construction and operation and maintenance charges in the following manner:

First. On any construction charges or assessments coming due during the first year after said payment.

Second. On any operation and maintenance charge over $1 per acre coming due the first year after said payment.

Third. Then, if any money remains, on the construction charge, and then on the operation and maintenance charge in excess of $1 per acre coming due the second year following said payment; then in the same manner upon the construction charges and operation and maintenance charges in excess of $1 per acre for subsequent years as long as the credit lasts.

(*j*) In the case of any additional sale at a price in excess of the price paid at a previous sale, in connection with which previous sale the amount provided for herein has been paid, to the district, the showing by statement under oath, the conditions and the penalties for failure to make such showing and payment and the procedure in connection therewith shall be the same as provided above with reference to the first sale, except in the case of such second, third, or additional sale at an increased price over and above the price at the first sale the amount to be paid to the district shall be 50 per cent of the excess of such last sale over the price at the preceding sale, plus the appraised value of improvements and betterments, provided the preceding sale was one at a price in excess of the original appraised value, plus improvements and betterments, and one on which the 50 per cent payment herein provided shall have been already made.

(*k*) The provisions of this article shall apply to any and all transfers and contracts for the transfer of lands in the district until all construction charges due the United States shall have been paid.

(*l*) The amounts so collected or received by the district on account of such sales of district lands, at prices in excess of the appraised value, plus the appraised value of improvements and betterments, shall be kept in a special deposit, secured by bond, and shall be promptly applied to the payment of construction charges as provided in this paragraph as the same come due from time to time.

(*m*) Adjudication of invalidity of Article 24 of this contract, or any part of said article, shall not impair or otherwise affect the validity of any other of the articles hereof.

(*n*) Leases and crop share contracts of lands in the district with option to purchase or other provision for transfer of title to the lessee or crop share tenant will be treated as agreements to sell, and the rental payments or crop share payments provided therein will be considered part of the purchase price.

(*o*) The district will keep track of transfers of land and agreements to sell by monthly inspection of the county records or abstractor's records or other suitable means of securing such information, and when transfers or agreements to sell or convey appear of record or otherwise come to the attention of the district officers, they shall discontinue or refuse to begin delivery of water to such land until the conditions of this contract have been complied with by the filing of the affidavits provided for herein and the making of the required payment to the district if payment is required under the terms of this contract.

(*p*) Rules and regulations for the purpose of carrying out and enforcing the provisions of this contract may be adopted by the Secretary, and the district will comply with such rules and regulations and will, for the purpose of carrying out the provisions of this contract, adopt rules and regulations of its own not in conflict with those established by the Secretary, and it is agreed and understood that such rules and regulations may include rules and regulations making the following requirements designated as subdivision (*q*) of this article, or any part thereof, to wit:

(*q*) That each year, prior to the delivery of water to any tract of land in the district for which water service is desired, the district shall require from the owner thereof or the duly authorized agent or representative of the owner, a card or other form of application for water service containing an affidavit setting out what if any sales, transfers, or agreements for the sale or transfer of the land described therein have occurred since the last application for water service on said land was filed, or, in case of no previous application having been filed since the appraisement thereof provided for herein was made, and the district will furnish to the Secretary, either copies of such applications and affidavits or a statement of the information contained therein, together with a reference to any transfers or agreements to transfer district land which are not reported in such applications but which have come to the attention of the district officers through inspection of the county records or otherwise and a list of the lands delinquent more than one year in the payment of any assessment, such information to be furnished the Secretary for his guidance in determining the amount of water to be delivered to the district by the United States. No land in the district shall be entitled to receive water any year until such application and affidavit has been filed with the district.

A contract was entered into with the State of Washington whereby the State agreed to assume the duty and responsibility of the development and settlement of the Kittitas division after the completion of the canal system, which provides funds necessary for the purpose to the amount of $300,000. Details will be worked out for carrying the terms of the contract into effect by the time the construction of the canal system is completed.

SELECTION OF SETTLERS

There is considerable public land on this division, and the selection of settlers for these lands will be handled as provided for in the act of December 5, 1924, subsection C of which reads as follows:

That the Secretary is hereby authorized, under regulations to be promulgated by him, to require of each applicant, including preference-right ex-service men, for entry to public lands on a project, such qualifications as to industry, experience, character, and capital as in his opinion are necessary to give reasonable assurance of success by the prospective settler. The Secretary is authorized to appoint boards in part composed of private citizens, to assist in determining such qualifications.

The regulations carrying out the terms of this part of the law provide that no entry for public lands within a Federal irrigation project will be accepted by the

(Continued on page 181)

The Washington State Fair—Yakima, Wash., 1927

By A. E. LAWSON, Secretary-Manager

Horticultural Building (right); New Dairy Exhibits Building (left)

ALL records were broken at the thirty-first annual Washington State Fair held in Yakima, September 12 to 17, 1927. An attendance of approximately 90,000 excelled by far all previous records. The direct receipts which amounted to approximately $70,000 are more than $10,000 greater than any receipts for previous years, leaving a balance on hand of approximately $28,000 for staging a 1928 fair.

Greater in importance than the attendance and the cash receipts are the educational benefits derived from a fair and there is no doubt that this year's fair presented in its exhibits in all of the departments, displays that were of State-wide importance.

It might be said that a new State fair was presented to the people of the State this year. An appropriation of $40,000 for permanent improvements was made by the State legislature in the 1927 session and the expenditure of this money in new buildings and landscape improvements changed the entire appearance of the fairgrounds and added a large amount of exhibit space that was badly needed. From this appropriation was built a new woman's building in which are housed all of the exhibits of domestic and fine arts with space for demonstration of all kinds of work done by women, particularly that which is connected with home activity. This new woman's building of Greek temple beauty occupies a commanding position on the beautiful lawn quadrangle and gives a distinction to the entire fairgrounds.

In addition a dairy products building was constructed. This building was constructed with the idea of lending assistance to the dairy industry which has grown to such importance in the State but which needs far greater development in the State and particularly in the Yakima Valley. It is constructed entirely of brick and is both fireproof and sanitary. In one section of this building was installed a complete butter-making plant and butter was made daily during the fair. We were particularly pleased with the results obtained in this demonstration. Crowds of people watched the operation daily of this plant and it was found that perhaps not over 10 per cent of the people knew how butter was made in a modern dairy plant. The remainder of this building was used for exhibits of miscellaneous dairy products sent to the fair from creameries, cheese factories, and individuals all over the Northwest. There were also commercial displays of dairy products and dairy equipment.

Our third building constructed was a new poultry exhibit building 96 by 150 feet. This building replaced the old poultry house and had twice the floor space which was well filled this year.

The above three buildings were the main items of the construction program,

Development and Settlement of Reclaimed Land

(Continued from page 180)

land office until the applicant has satisfied an examining board that he possesses the necessary qualifications of industry, experience, character, and capital.

The applicant must possess good health and vigor, must have had at least two years' actual experience in farm work and farm practice, and must have at least $2,000 in money, free of liability, or its equivalent in livestock, farming equipment, or assets as useful as money, with some reduction possible in the amount of money and experience required when the farm unit applied for is 10 acres or less.

By means of this selection, an effort is being made to do justice to both the settler and the investment in the project. The failure of a settler to make good is more serious to him than is the delay in the repayment of the cost of the works to the United States, so if the board decides that an applicant has no chance to succeed, they are doing him a kindness in not allowing him to go on a piece of land.

The bureau is now engaged in the construction of a canal system for this division, estimated to cost $9,000,000, and several years will be required to complete the work.

As the construction of the Kittitas division proceeds, additional details will be worked out for handling settlement and farm development, to the end that all important problems may be given the attention necessary to make the venture a complete success.

but in addition to construction, money was spent on new lawns, flower beds and shrubbery, and almost all of the old buildings on the fairgrounds were given a new coat of white paint.

Every department of the fair showed an increase in the number of exhibits entered. "The greatest display of livestock ever shown at the Washington State Fair," was the declaration made by many of the exhibitors. It overflowed the exhibit pens and stalls. The dairy show in particular has never been equaled. At this fair were 110 Holsteins, 80 Jerseys, 60 Ayrshires, 50 Guernseys, and 45 Brown Swiss. The showing of beef cattle was also of merit with Shorthorns leading with 70 animals shown. The draft horse show was particularly attractive with the largest representation in the Shire classes. The sheep show was up to normal with a very good representation from the boys' and girls' club members. The swine show was larger than it has ever been for several years but not nearly so large as it should be. Swine production, along with dairy production, needs more expansion in this State, and particularly in the Yakima Valley.

The agricultural and horticultural show and county exhibit competition perhaps shows best the representative character of the fair besides adding real educational value. There were 20 county exhibits on display this year besides Yakima County, which had a beautiful display of apples which were particularly representative of this county. This showing of county exhibits was pleasing because it speaks of a State wide interest and support of the fair. It is interesting to state that in 1923 seven counties were represented. No fair was held in 1924 and in 1925 13 counties exhibited; in 1926, 16 were represented, and this year 21 exhibited. Chelan County was awarded the sweepstakes prize as well as first among central Washington counties. Spokane County was first in the eastern division and Cowlitz County in the western division.

The number of exhibits and size of the show can be easily seen by the fact that 25 per cent more premium money was paid out this year than in any former year.

THE State Bureau of Highways of Idaho is arranging to start construction on a new bridge across Snake River between Burley and Heyburn, Minidoka project.

MORE than 44,000 turkeys will be marketed from the Newlands project this fall.

New Woman's Building, Washington State Fair

Agricultural Development And Irrigation Construction

DAVID WEEKS, associate in agricultural economics, and Charles H. West, assistant agricultural economist, in cooperation with the Federal Land Bank of Berkeley, have prepared as Bulletin 435 of the University of California, a comprehensive discussion of the problem of securing closer relationship between agricultural development and irrigation construction, which supplements and illuminates a similar study of this problem made by the Bureau of Reclamation during the past two or three years.

The key-note of the discussion is found in what is now recognized by leading irrigation economists as an almost axiomatic statement that "irrigated agriculture in the last analysis is an economic problem." Quoting from the bulletin—

"The coordination of agricultural and irrigation development is difficult. Once a project is begun, prompt settlement is necessary. The problem is one, then, of constructing only projects which are feasible when all of the elements of cost are considered, and of developing a plan of land settlement whereby prompt utilization of irrigation construction will take place.

"The feasibility of the project can be determined only by careful engineering and economic analyses. A large element in the success of the projects is the accuracy with which the time required for settlement can be gauged and estimates of the cost of delay computed. Costs incident to the purchase of raw lands and the construction of irrigation works are no more important than costs incident to holding undeveloped land after construction, and to the improving and equipping of farms. Feasibility surveys must include careful soil surveys to determine the productive capacity of the land. The project is not feasible unless the soils produce enough to make farming profitable after project operation and maintenance and interest on the construction cost are deducted. In making estimates of costs and of income, changing prices of materials used in construction and of products sold by the farmer must be given careful attention. Projects must be studied with reference to trends of production of crops adapted to them and with reference to business conditions. In addition to determining the feasibility of irrigation projects and working out a sound land-settlement policy, consideration should be given to the timing of irrigation development more nearly in accord with the demand for land by prospective settlers.

"An economic analysis is just as difficult as the design of irrigation structures and just as important. Engineering reports should be supplemented by economic reports. The importance of economic studies in connection with feasibility studies is now generally recognized, but we are still greatly handicapped by the want of basis economic data. Years of research in the engineering field place at the command of the engineer a large amount of information which forms the basis of more or less exact determinations. Economic estimates are of necessity too general.

"The difficulty in the past has been that although the importance of the factors of feasibility has been realized, the relative importance of the various items has not been measured. The development of a basis for applying a means of measurement of these factors to feasibility investigations will mark a new era in scientific analysis of project feasibility."

Belle Fourche Project Turkeys About Ready to Market

Meat and Refrigeration Service on the Newlands Project, Nevada

By A. W. Walker, Project Superintendent

THE problem of keeping fresh meats during the hot summer months in an agricultural community is considerable. Most of the farmers on our irrigation projects can successfully grow the meats, but few of them are equipped to keep it fresh any length of time during the hot weather. The question has generally resolved itself either into going without fresh meat most of the time or securing limited quantities from the butcher shop and paying prices accordingly.

On the Newlands project this vexing problem has at least been partly solved by the enterprising spirit of the Fallon Ice & Cold Storage Co., which is located at Fallon, Nev., near the center of the project.

A portion of their refrigerating room has been set aside for the benefit of their farmer patrons and run on the principle of a safety-deposit vault in a bank.

The room at present is 18 feet long by 12 feet wide and 12 feet high. There are now 45 box compartments in this room, each 2 by 2 by 3 feet wide, or 12 cubic feet capacity. The walls and doors of the compartment boxes are open lattice work. Each compartment can be locked and will hold approximately 400 pounds of meat. The meat is cut into pieces that meet the consumers' requirements before placing in the boxes. This saves time and trouble in getting the meat out of storage, as frozen meat is difficult to cut. The temperature of the room is kept between 24° and 28° F., which freezes the meat so that it will keep indefinitely.

The moisture content of the air is controlled by calcium chloride being placed in open vessels. Occasionally the room temperature will rise above 32° F. for a short period and mold will start to grow on the meat if there is sufficient moisture in the air. Tainting of the meat will follow if the mold is allowed to grow unrestricted.

The building is constructed of concrete blocks and insulated with 6 inches of sheet cork. The direct expansion (of ammonia) method is used in lowering the temperatures of the room.

The charges for a box in the cold storage room are $2 per month or $7 for the season of five months. A patron simply calls at the office and makes known his wish to get into his rented cold storage box and an attendant goes with him and lets him into the main room.

The primary reason why the room was established was creation of new business for the refrigerating plant and company. Each patron when he takes home a piece of meat will also buy ice, and other items handled by the company, to keep the meat at home for a few days. The revenue from the room pays interest on the investment and creates good will, for the farmers surely appreciate the service.

The company handles ice, fuel oil, wholesale candy, bottled goods, like soda water and light beers, and is contemplating a wood and coal yard. They have cold-storage space of all kinds, amounting to 8,000 cubic feet. They store vegetables, hams, bacon, candy, etc., in a room with a regulated temperature from 32° to 40° F. for 1½ cents per pound for the season.

This Water User is Glad to Pay Bills

The ERA *is glad to make special mention of a water user on one of the Federal irrigation projects. Replying to a recent questionnaire, this water user states that all charges due on construction and operation and maintenance on his farm have been fully paid. His questionnaire concludes with the following statement:*

"Any farmer can make money here who doesn't overcrop and is willing to work. What we need here is more real farmers. I have made some money here every year, having lived here nine years; and it is a pleasure for me to pay my bills as they come due."

We would be glad to hear from other water users in a similar strain.

THE new beef feeding yards at Belle Fourche are using 135 tons of beet pulp a day feeding 1,500 head of steers.

Reclamation Project Women and Their Interests

By Mae A. Schnurr, Secretary to the Commissioner and Associate Editor, New Reclamation Era

Old Art Revived: Rug Making

THE illustration shows a home demonstration agent teaching a group of women how to make various kinds of rugs. The meeting is being held in the women's club building of Quincy, Fla. Both braided and woven rag rugs interest a good many of the club members, and the making of hooked rugs is a revival of an old art that has become very popular all over the country. Through home industries of this kind, many rural women are beautifying their homes or increasing their cash income, and are being enabled as a result, to get for themselves many household conveniences and labor saving devices.

Artistic designs and patterns in beautiful color combinations are being standardized in this rug-making industry by groups of women who are working together in community or even county-wide organizations, known as county weavers' associations. Thousands of dollars have been cleared in one year's time by such groups of women working together in a single county as a single unit. Commodity organizations have followed successful production and standardization work in rug making in a similar manner to what has been done in the cooperative marketing of other farm home products.

Teaching Rug Making at Woman's Club Building

Spare Your Patience

Better ways to do things, thus saving time and your patience, are always worth the space it takes to pass them on.

Have you ever been in a hurry and tried to open a flour, sugar, or salt sack? If you have you know that you always pull the wrong thread of the chain stitch.

Here is a way that never fails:

Lay, face up the side with the single stitching, begin at your right hand end of the seam and it will unravel by loosening the lock stitch.

Satisfied—Contented

When a woman over 50 years of age can go on a new project, endure all the hardships of pioneering and come up smiling, with a story of perfect contentment with what has been accomplished in the time, and with the means at her disposal, it is truly an account to be repeated in this section, which is read by thousands each month, in all sections of the United States, as our correspondence and mailing list indicate.

The following story received from a housewife on the Minidoka project is printed without giving the name of the author; this at her special request.

Coming to Idaho in 1911 after living in the rain belt of the North, East, and South, until about 50 years of age, I believe I can safely make comparisons between the conditions existing on the farms there and here.

We came to the Minidoka project when it was new and have experienced some of its hardships, not the least of which were the poor houses and lack of farm and road improvements. My first ride over the frozen, rutted roads was like jolting over cobblestones. The little shacks reminded me of inverted baking powder cans.

Since coming here we have made several trips back to our former home and found conditions little better than when we left. The kerosene lamp was the only lighting system in most country homes. We have outgrown that stage and now light our homes with electricity. We also have the iron and many other electrical appliances which lighten household tasks. These appliances range from toasters to incubators to hatch our chickens.

Most women will be interested in the social life of this "Empire of the West." With electricity to help us, we have much more time to spend socially and in self-improvement. There are clubs of different kinds—some for pleasure and amusement, others of real aid to the community. Women's vacation camps in connection with the extension department of the University of Idaho keep us informed in the newest methods in home making. Such gatherings are well attended, and they are recreational, educational, and inspirational.

Our schools are of the best. Standards for teachers are being continually raised. Books are furnished to pupils by the district, and in some places auto busses bring the children to and from school.

In 1910 sagebrush covered a large part of the Minidoka project and, in a way, proved a blessing as a fuel when settlers were too poor to buy coal. It littered the floor and vexed the housewife. Some one

Home of H. C. Stetson, Superintendent, North Platte Project, Mitchell, Nebr.

called it a "three-man wood"—one to cut it, one to feed the stove, and one to cook with it. This brush was removed from the land, high places leveled, ditches made, and farming began in earnest. The new ditches often broke and flooded the wrong field. After some time and experience, these things were corrected.

The soil is the most productive I have ever seen. According to a soil expert, this fertility is due to potash which would cost $1,000 per acre if applied artificially. We can stop a drought at any time. Each crop can receive its water when needed and have it turned off when not needed. Because of little rainfall between April and the fall months, crops can be harvested without loss. The schedule of work can very nearly be prepared in the spring and followed through the entire season.

There are many ways for the housewife to raise pin money, but I have never found anything better than a flock of well-fed hens. It's a bank account and you need have no fear of overdrawing. Another source of income is our dairy. The butter is unexcelled in quality and recently discovered to be unusually rich in vitamines.

Where it was once barren, bright flowers relieve the monotony of the sagebrush plains. The green of alfalfa and the gold of grain fields against a background of snow-capped mountains make a picture never to be forgotten.

After years of work and worry that go with making a home on a new irrigation project there comes contentment as a reward of well-directed labor.

The following poem was inspired and written at the time of the visit of the wife of Congressman Winter, of Wyoming, to the proposed Columbia Basin project in Washington.

Lake Pend Oreille

Amid the mountains' frosty peaks,
From out the streams of ice and snow
Through sultry summers and winters bleak
I was born perfect, ages ago.

When just a babe in the valley below,
Baptized with raindrops, glistening pure,
Learning then from the rays of my father, to know
That my mission in life was to feed, heal, and cure.

My mother, the Earth, in whose arms I was placed
The day I was christened Lake Pend Oreille,
Whispered wise words of problems I faced,
Then told me of love, and my fiancee.

My childhood was happy, with playmates galore,
The fast-flowing streams, the stubborn old rocks,
The frolicking wild deer, the lions that roar,
The pine cones, the flowers, the birds in vast flocks.

Yes, I have been giddy and fickle and vain,
I have flirted with rainbows, clouds, and moonbeams.
I have hidden my eyes behind fans of white rain,
I have vamped and been courted by men of great fame.

First came the red man with feathers, and paint,
War whoops, canoes, flint fires on my banks;
He took food from my breast, and called me a saint,
He caressed me, he thrilled me, then left without thanks.

Then came the whites with blood of the French,
They had eyes for my charm and beauty and grace;
They fell to their knees in great reverence
And with passionate lips they kissed my cool face.

And down through the years I have heard my mate call
I've been dormant too long, I am ready to wed;
He's steadfast and true, he's handsome and tall,
He wants me, he's waiting, oh, how he's plead.

I have promised to go real soon,
Down where the rivers meet,
Where the red-blooded men of this nation
Will place me, there at his feet.

After our marriage which takes place in May,
Columbia, my dream child you'll see
Green meadows, fine homes, happy children at play—
A great western empire he'll be.

—Alice Maltby Winter, Casper, Wyo.

Acres of Cabbages on the Rio Grande Project, N. Mex.-Tex.

British Settlements in Canada Under the 3,000 Families Scheme

Extracts from a report by the Right Hon. the Earl of Clarendon, chairman, and Mr. T. C. Macnaghten, vice chairman, of the Oversea Settlement Committee, November, 1926

"UNDER the terms of an agreement entered into between His Majesty's Government and the Dominion Government in August, 1924, the latter government agrees to provide suitable families from the United Kingdom, who are recruited and selected by representatives of the Dominion Government, with suitable farms in established districts throughout Canada. The farms must contain a sufficient amount of land fit for immediate cultivation, and a house must be provided upon each of them.

"The total indebtedness which may be assumed by any family must not exceed $7,500 and varies from a minimum of $3,500 up to this maximum. The debt incurred for the land, house, and farm buildings, which must not exceed $6,000, is repayable to the Dominion Government, and the debt for livestock and equipment, which must not exceed $1,500, is repayable to His Majesty's Government. These debts are repayable with interest not exceeding 5 per cent in 25 equal annual payments. The annual repayment in the case of a family whose debt is $3,500 would be approximately $250 a year, and about $525 in the case of a family whose debt is $7,500. Under the terms of the agreement the first repayment falls due at the end of the second season after the family's arrival in Canada, but in the case of farms from which no immediate large revenue may be expected, the first repayment is usually deferred until the end of the third season after arrival.

"Under the Dominion Government at Ottawa, the scheme is supervised by the land settlement branch of the department of immigration and colonization of which the soldier settlement board (i. e., the organization set up to deal with the settlement of Canadian soldiers upon the land) has recently been made a part. The staff of the board, throughout the Dominion, which actually handled the various stages of soldier settlement, is now used to handle the settlement of the British families. The head office of the board is at Ottawa, but with a view to decentralizing administration the Dominion is divided into 11 districts.

"Each of the 11 districts is divided into subdistricts, of which there are about 120 in the whole of the Dominion. In charge of each subdistrict is a field supervisor. This officer maintains no office of his own. He usually lives in a small town in his subdistrict, is provided by the Government with a motor car, and spent his time touring in his subdistrict and advising and assisting soldier settlers in all possible ways. He made the arrangements for their entry upon their farms, and advised them as to the purchase of their livestock and equipment, and as to all their agricultural operations. The settlement of Canadian soldiers is now virtually complete and the work of supervising them at the beginning of their farm life is diminishing. Therefore the field supervisor is now able to devote part of his time to the settlement of British families.

HANDLING THE BRITISH FAMILIES

"The farms upon which British families have been placed are owned by the Dominion Government. Most of them have been occupied by Canadian soldiers at some time or other since the war, but have reverted to the Government, in some cases owing to the death of the occupants, in others owing to their having abandoned farming for other callings, or having failed to adapt themselves to farm life. More than 30,000 Canadian soldiers have been placed upon farms by the soldier settlement board, and it is natural that in course of time a certain percentage of the farms should have fallen vacant and reverted to the Government. Some of the vacant farms are considered unsuitable for the settlement of British families and those which are being used have been carefully selected. In every case they have been revalued and the price put upon them by the land settlement branch has been reviewed by independent advisory committees. In many cases the prices charged are substantially, perhaps 10 per cent, lower than those obtainable in the open market.

"When the families reach the railway point nearest to the farm to which they are proceeding, they are met by the field supervisor, or, in cases where several families are arriving at different points on the same day, by a local resident whom he has deputed to act on his behalf. From this time onward through every phase of their settlement, while learning to farm and working for wages, when taking over their own farms, and subsequently when buying equipment, plowing, planting, seeding, harvesting, and marketing, the British families are looked after by the field supervisor until they are fully established and capable of managing their own farms.

"After the families have arrived and been located on a farm, the district offices are authorized to purchase on their behalf their immediate requirements in stock and equipment; that is, one or two cows, a pig, and some poultry. A cheap horse and buggy are often bought, where the husband is being found employment at some distance, or where the school is at a greater distance than the children can walk. All these are purchased by the field supervisor, who usually takes the head of the family with him to inspect the purchases, the cost of which is debited to the loan made by His Majesty's Government.

"The amount expended on these initial stock purchases seldom exceeds $200. Only in special circumstances do the Dominion authorities agree to the payment to any family of a substantial portion of the balance of the loan, which may not exceed an average of $1,500 per family, made by His Majesty's Government for stock and equipment, etc. Usually the expenditure of the balance is not sanctioned until the family has successfully completed the probationary period, in most cases from six months to one year, has been finally accepted by the Dominion authorities for settlement under the scheme, and has been installed upon the farm which it is to occupy and cultivate. Consequently the risk of loss of any substantial portion of the advances made by His Majesty's Government is very small.

"At the end of the probationary period of a year or less the families are allowed to buy the balance of their stock and equipment; that is, in most cases a team of four horses, additional cows up to the capacity of the farm, farm machinery, etc. All this additional livestock and machinery is bought out of the advances made by His Majesty's Government, under the supervision of the field supervisor, who goes with the head of the family and helps him to make the purchases.

"The essential difference between the handling of the Canadian soldier settler and the British settler under the three thousand families scheme is that the former has been allowed considerable discretion in choosing his farm and buying livestock and farm machinery, while the latter's farm is most often chosen for him, and the field supervisor guides him so far as need be in the purchase of stock and equipment.

THE SCHEME IN OPERATION

"The scheme has thus far proved a conspicuous success and promises to become the most successful effort in colonization undertaken by any government in

modern times. The total number of families at present settled under the scheme is 1,504, comprising 8,381 souls.

"The percentage of complete failures is very small indeed. A few families have abandoned the scheme, some of these returning to the old country. Others have abandoned the scheme temporarily and intend to return to it. Possibly some 2 per cent have found work in towns. Those who have abandoned the scheme, whether temporarily or otherwise, hardly exceed 5 per cent of the whole. Of those that remain, some 10 per cent appear to be below the general average, and consequently we must regard their success as doubtful. We believe, however, that between 80 and 90 per cent of the families settled under the scheme will, given reasonably favorable conditions of climate and markets, make good and remain permanently settled upon the land as farmers. In saying this we do not overlook the fact that the scheme came into operation in the season of 1925, and that only those who came out in the season of 1925, namely, 454 families, have been a full year in Canada. The scheme must be tested for some time longer before it will be possible to speak with complete assurance in regard to the percentage of successes and failures. The total liabilities undertaken by the families, which may not exceed $7,500, and probably average about $4,000 to $5,000, are large, and there would, in our opinion, be distinct advantage to future settlers if the liabilities under any new scheme could be made somewhat smaller."

Riparian Lands Subject to Levy of Taxes by District

By H. J. S. Devries, District Counsel

IN the case of Parker *v.* El Paso County Water Improvement District No. 1 (297 S. W. 737), recently decided by the Supreme Court of Texas, the plaintiff sought to enjoin the district from obstructing the flow of water through the plaintiff's ditch and to remove a cloud from his title claimed to result from existence of liens upon his lands for charges assessed by the district.

The plaintiff was the owner of lands riparian to the Rio Grande and included within the irrigation district created under the statutes of Texas, which district had contracted with the United States under the Rio Grande project, New Mexico-Texas.

The supreme court, in affirming the decision of the court of civil appeals (260 S. W. 667), denying the injunction held that the plaintiff's contention that his land, because riparian, could not be included in the improvement district, was without merit.

In ruling on the plaintiff's claim that by using the open channel of the river to carry its impounded waters the defendant had permitted the water to mix and mingle with the natural flow so as to become a part of plaintiff's riparian water and subject to his use, the court held that the defendant clearly had a right to so use the channel and that the plaintiff was only entitled to his proportion of the riparian water which is the water below the highest line of the normal flow of the river. But the court also found that this was insufficient for beneficial use for irrigation if divided between the riparian owners and that the plaintiff was entitled to all benefits accruing to lands in the district and as well subject to the levy of taxes for the support of the district.

The court said: "It is equally certain that the fact that the defendant in error might not desire his land placed in the district; that he might not desire to irrigate it at all, that he could irrigate it from a different source; or that it was riparian land, would not prevent its inclusion within the district within the process clause of the Federal Constitution."

Yakima's $1,000 One-Ton Apple Pie Advertises Project

AS an advertisement for national apple week and the Yakima project, Washington, the world's largest apple pie was successfully baked recently, and incidentally disposed of in an equally successful manner. The mammoth pie is shown in the illustration on the inside front cover page of this issue. Quoting from the Yakima newspapers—

"With all the world looking on through the eyes of motion-picture cameras, 1 barrel of flour, 100 pounds of sugar, 2½ pounds of cinnamon, and 400 gallons of apples were transformed into the largest pie ever baked. This pie, which weighed slightly more than a ton and cost $1,000, would be exactly the right size to go on the table of a giant 1,000 feet tall and weighing 150,000 pounds. The dough was rolled into shape with a rolling pin 6 feet long, 10 inches in diameter, and weighing 50 pounds. Nine girls were necessary to handle the rolling pin. In order to handle the dough for the crust it was cut into strips and laid into the monster pie pan, specially made for the occasion, a strip at a time. When the bottom dough was in place several barrels of cooked apples were dumped into the pan while girls with new garden rakes worked the material to a level. When the top crust was in place 20 girls crimped the pastry around the edge of the pan.

"When ready for baking the brick door to the front of the oven was raised with a block and tackle, and a winch pulled the huge pie into the intensely heated compartment where it remained for nearly an hour. The pie was hauled out of the oven with a tractor, cut by a special knife with a blade 4 feet long, which was made for the occasion, and served on paper plates to the crowd."

Reclamation Fund Safe From Columbia Basin

There seems to be a feeling, expressed more or less definitely in some of the northwestern newspapers, that if the Columbia Basin project is approved by Congress for construction it will stop the development of all other irrigation projects in Southern Idaho and Washington, the intimation being that the Columbia Basin project would absorb all the reclamation fund so that no help could be given to other projects.

Plans for financing the Columbia Basin project have not definitely been determined. This is a matter finally to be passed on by Congress. The reclamation fund has never been considered in this connection.

To provide for economical construction and the completion of the project in a reasonable period would require much more than the total yearly accretions to the reclamation fund. Those in the Northwest who are interested in its construction and have given the matter considerable thought recognize this and are looking for funds from other sources. Furthermore, the fund for the next 10 years will be wholly absorbed in the completion of old projects and in the construction of the new projects authorized by Congress.

Orchard Mesa Pumping Plant, Grand Valley Project, Colorado

By C. M. Day, Mechanical Engineer, Denver Office

THE Orchard Mesa pumping plant on the Grand Valley project, Colo., is located about one-half mile from the town of Palisade, Colo., and is used for pumping water from the Colorado River to about 11,000 acres of land on Orchard Mesa, on the south side of the river and extending from Palisade to Grand Junction, a distance of about 16 miles. Two canals serve this land, a high canal requiring the water to be pumped against a static head of 125 feet and a low canal pumping to a head of 40 feet. The district has the right to divert 400 second-feet of water from the Colorado River and to pump 125 second-feet onto the Orchard Mesa lands, the balance of 275 second-feet to be used for power and returned to the river above the diversion dam of the Grand Valley irrigation district.

ORIGINAL INSTALLATION

The plant was constructed originally by the Orchard Mesa irrigation district in 1909 and operation was started in 1910. The pumping units were of the type known as "direct-pumping units," by which the pumps are driven by hydraulic turbines. There were four horizontal units in the plant, two being designed for pumping 62.5 second-feet of water against a total pumping head of 130 feet and two for pumping 62.5 second-feet against a total pumping head of 40 feet. The net power head available for operating the turbines was 75 feet.

The turbines were of the horizontal closed-flume type having double-discharge runners and two taper-plate steel draft tubes, and were designed for operation under the following conditions:

High-lift turbines.—23-inch double-discharge runners to deliver 750 horsepower at 490 revolutions per minute and 75 feet effective head, using 110.6 second-feet of water for power, giving an efficiency of 80 per cent.

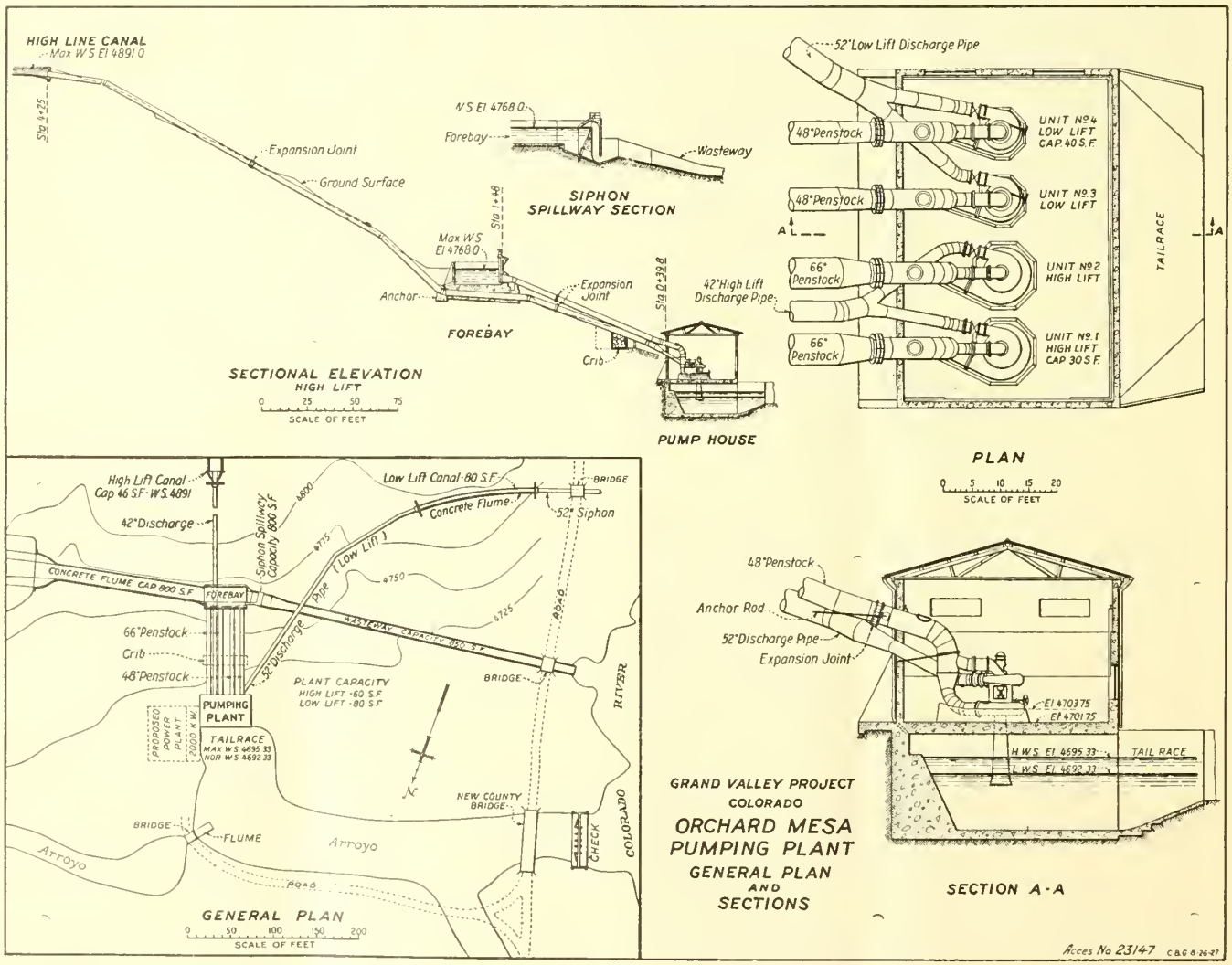
Low-lift turbines.—23-inch double-discharge runners to deliver 275 horsepower at 490 revolutions per minute and 75 feet effective head, using 40.44 second-feet of water for power, giving an efficiency of 80 per cent.

The pumps were designed for the following conditions:

High lift.—23.35 second-feet at 490 revolutions per minute and 130 feet total head, developing 63 per cent efficiency.

Low lift.—35.6 second-feet at 490 revolutions per minute and 40 feet total head.

The water for the plant was supplied through a canal with a designed capacity



of 525 second-feet and about 8½ miles long, being diverted from the Colorado by a brush and rock dam. The concrete fore bay was provided with a wasteway gate and timber chute with capacity to waste the entire canal flow into the Colorado River. The high-lift units were each supplied by a 66-inch plate-steel penstock, and the low-lift units by 48-inch penstocks, each penstock dividing at the plant to connect to the turbine and pump.

When water was first turned into the system, the whole hillside on which the fore bay and penstocks rest threatened to slip. A rock-fill crib was constructed between the plant and fore bay to serve as a retaining wall to guard against this slipping, also serving as a support for the penstocks. In 1922 an additional slip occurred, caused by a slight settlement of the fore bay structure. All four of the penstocks were affected by this slip, and when the concrete was chipped away where they connect with the fore bay the pipes sprang back uphill for about 1 inch. No. 1 high-lift pumping unit was lifted slightly and sprung out of alignment, and to bring it back to its original position one joint in the penstock was cut and reconstructed as a slip joint. The comparative performance of the original pumping units is shown in Table 1.

RECONSTRUCTION WORK BY THE UNITED STATES

In 1921 a contract was entered into between the Orchard Mesa irrigation district and the United States by which the United States would construct and reconstruct the works for the district. Under this contract the pumping machinery, fore bay, penstocks, and building were to be thoroughly overhauled, the wood-stave discharge pipes replaced with steel pipes, and the tailrace capacity increased and a new tailrace excavated for a flow of 800 second-feet. Of this flow of 800 second-feet, 400 second-feet are for the use of the district and the remaining 400 second-feet for future development of power by the United States.

An inspection of the pumping machinery in February, 1924, showed that the pumps were worn out and the turbines in little better shape. The pump cases for both high and low lift pumps were identical, and were fitted with stay bolts to withstand internal pressure. These stay bolts caused eddies resulting in cavitation to such an extent that in places the worn pockets extended nearly through the cases. This action is illustrated in the accompanying photograph. The low-lift pump cases were provided with filler rings on the inside to accommodate the smaller diameter impeller used for the lower head.

An estimate of the repairs required on the original turbines and penstock connections and prices quoted for new pumps showed that the cost of overhauling the units would be extremely high and that if this were done the machinery would still be obsolete and inefficient. It was therefore decided to purchase new units of the vertical spiral turbine case type, designed especially for the two pumping conditions to be met.

In August, 1924, specifications were issued for four new vertical direct pumping units to operate under the following hydraulic conditions:

	High lift	Low lift
Maximum power head, net ... feet	74	74
Minimum power head, net ... do	71.5	71.5
Total pumping head, 1 pump running ... feet	126.5	39
Total pumping head, 2 pumps running ... feet	130	41
Size each penstock ... inches	66	48
Length each penstock ... feet	120	120
Size discharge pipe ... inches	42	52
Length discharge pipe ... feet	450	321
Capacity each pump ... second-feet	30	40

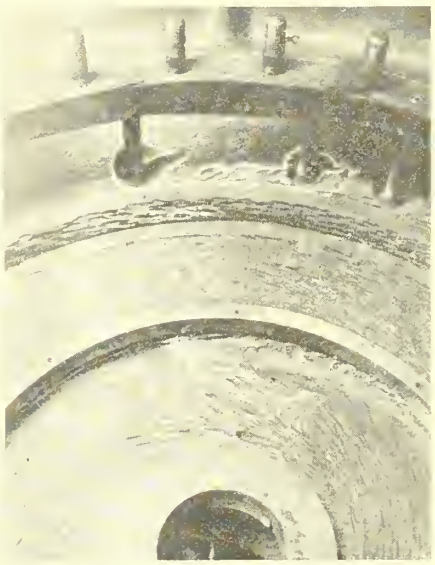
The provision for extra capacity in the high lift units was made to give the plant a reasonable surplus to provide for a drop in capacity due to wear, and in case of a break-down of one of the low lift units, would permit pumping the surplus of 15 second-feet into the high line canal and dropping it into the low lift canal at any convenient place, to augment the output of one low lift pump until the other unit was repaired. The Worthington Pump and Machinery Corporation was low bidder, their price for the four units, exclusive of repair parts, being $30,300, and the total shipping weight 110,200 pounds. The guaranteed performance of the units was as follows:

	High lift units		Low lift units	
	Capacity at 130-foot head	Over-all efficiency of unit	Capacity at 4 foot head	Over-all efficiency of unit
	Second-feet	*Per cent*	*Second-feet*	*Per cent*
	14	47.5	20	52
	18	56	25	60
	22	62.5	30	65.5
	26	67	35	69.5
	30	69	40	71
Speed with wicket gates and pump discharge valve wide open (revolutions per minute)	525		505	
Speed with wicket gates wide open and pump discharge valve closed (revolutions per minute)	670		515	
Weight of heaviest part, turbine casing (pounds)	13,000		5,500	

The pumping units are all of the same type, being vertical centrifugal pumps direct-connected to vertical spiral scroll case turbines with Francis type runners. The new discharge pipes are of riveted plate steel, the 52-inch low lift pipe being galvanized and dipped. The high lift pipe is of black steel and both pipes were dipped while hot in a hot bath of preservative coating at a temperature of 450° F.

The new high lift units were put into operation in April, 1925. (See New Reclamation Era, March, 1925, p. 37.) At that time the penstock connections had not been anchored, and the reaction of the pumped water was great enough to force the units slightly out of vertical alignment, causing the turbine guide bearing to heat. Temporary 1½-inch stay rods were anchored in the upstream concrete wall of the building and the units were pulled back into proper alignment. They operated satisfactorily in this manner until permanent pipe anchors were installed.

The new low lift units were put into operation in April, 1926, and have operated satisfactorily since that time.



Cavitation on Inside of Old High Lift Pump

The following table shows the comparative performance of the old and new pumping units:

Gate opening	Pumped water second-feet		Power water second-feet		Total water through plant second-feet	
	Old units	New units	Old units	New units	Old units	New units
0.5	100.1	72.3	323.6	101.34	423.7	226.02
.6	119.7	99.3	332.8	110.95	452.5	273.17
.7	128.4	121.4	348.4	138.86	476.8	331.44
.8	133.7	138.2	362.8	155.64	496.5	372.73
.9	136.4	147.1	372.8	172.63	509.2	405.40
1.0	138.6	152.4	373.4	185.51	512	427.79

Plotting curves of these results shows that when the new high lift pumps are delivering 45 second-feet and the low lift pumps 80 second-feet or a total of the 125 second-feet which is the water right belong-

(Continued on page 190)

Points for the Farmer to Remember

By George O. Sanford, Superintendent, Sun River Project, Mont.

(From the Montana Farmer)

TWENTY-FIVE acres of beets yielding 18 tons per acre will give the same net profit as 200 acres yielding 11 tons per acre.

Ten acres of potatoes yielding 300 bushels per acre give as much profit as 70 acres yielding 150 bushels per acre. The 10 acres put 3,000 bushels on the market. The 70 acres put 10,500 bushels on. Why glut the potato market with 7,500 bushels that yield no profit?

Sweet clover will solve pasture problems and improve land at the same time.

A few cows and chickens will pay your grocery bill.

The practical way of improving your dairy herd is by the use of a good purebred dairy sire.

Alfalfa pasture with a little corn and skim milk is heaven for growing pigs.

Manure puts a profit in sugar beets.

Alfalfa and sweet clover are like great men—their influence is felt long after they are dead.

If you will put potatoes on alfalfa land and sugar beets on manured land, you will put money in the bank at harvest time.

Growing sugar beets or potatoes on good land is money making, but to grow them on poor land is always heart breaking.

Every farm should have a garden.

It is that extra bushel or ton above the cost of production that makes profit.

New Reclamation Era Speeds Up Settlement

Mr. W. G. Ide, manager of the Oregon State Chamber of Commerce, has written to Commissioner Mead as follows:

"I think I have a new one for you in land settlement.

"On August 15, the New York Times published a story on Oregon's land settlement system, reproduced from the August number of the NEW RECLAMATION ERA. On September 7, we received a letter from Mr. Frank Haralson, 731 Franklin Avenue, Brooklyn, N. Y., stating that he is employed by an outside company in the office of the New York Times and heard our telegraphic request for a copy of the Times and he became much interested and wrote for information.

"As a result of the information sent him he wrote on October 5 to W. G. Amos, secretary of the Lebanon Commercial Club, Lebanon, Oreg., relative to lands suitable for poultry farming and requested Lebanon advertising matter and a copy of the local paper. The letter was turned over to W. R. Alvin, a responsible realtor, for reply, who immediately submitted a 33-acre poultry farm.

"Upon receipt of information Haralson wired for photographs, stating that the description sounded good enough to buy unsight and unseen. Mr. Alvin sent photographs by air mail, together with a sale contract. Upon receipt of the contract Mr. Haralson wired the money from New York, the entire transaction requiring six days.

"I submit to you that this is land settlement up-to-date."

Orchard Mesa Pumping Plant

(Continued from page 189)

ing to the district, 215 second-feet of power water are required, or a total of about 340 second-feet through the plant. When pumping 125 second-feet with the original units about 336 second-feet of power water were required, making a total of 461 second-feet of water through the plant. This is an indication of the improvement that has been made in the efficiency of turbines and centrifugal pumps in the past 18 years, and also shows that when power is developed at this site in the future and with the district using its full right of 125 second-feet for the Orchard Mesa lands, there will be an additional 61 second-feet of water available for power in addition to the diversion right of the United States for 400 second-feet for power development, amounting to approximately 500 additional horsepower.

Carlsbad Cotton Makes Three Bales to Acre

Joe Yarbro, a water user on the Carlsbad project, New Mexico, is being congratulated on his wonderful cotton crop. Project Manager Foster states that he had a talk with Mr. Yarbro about the middle of October, and at that time Mr. Yarbro said that he would pick 33 bales from 9½ acres, or considerably more than 3 bales per acre. He had already picked 21 bales from 9 acres in two pickings, with a third picking to follow.

Echo Dam Contract Award, Salt Lake Basin Project

Contracts totaling $1,512,067.65 were awarded on November 8 for the relocation of parts of the Union Pacific Railroad tracks and parts of the Lincoln Highway, and for the construction of Echo Dam, on the Salt Lake Basin project, Utah.

The contract for the relocation of the tracks and highway was awarded to the Utah Construction Co., of Ogden, Utah, on a bid of $386,969.90. The contract for the construction of the dam was awarded to A. Guthrie Co. (Inc.), of Portland, Oreg., on a bid of $1,125,097.75.

The relocation of portions of the railroad tracks and highway is necessitated by the flooding of the present routes by the reservoir created by Echo Dam.

Alfalfa Most Profitable Crop on Newlands Project

F. B. Headley, who is connected with the University of Nevada experiment station, explains why alfalfa is the most profitable crop on the average on the Newlands project. It costs $7.18 per ton to raise. The total annual value of the crop of about $1,000,000. Other crops are valued at about $250,000. The items which enter into the cost per ton of producing alfalfa on the project are as follows: Man labor at 40 cents per hour, $2.30; horse labor at 12 cents per hour, 78 cents; interest on investment, $2.02; taxes, 38 cents; water charges, 35 cents; equipment, 52 cents; overhead and miscellaneous, 83 cents; total cost per ton, $7.18. The value of the credits, hay and pasturage, realized from the above costs was found to be $9.57 per ton. On some of the better farms at Fallon and Fernley the net return, above all costs, per acre was $11.50.

Shoshone District in Good Financial Shape

E. E. Roddis, district counsel, has forwarded the financial statement of the Shoshone irrigation district, from November 1, 1926, to October 1, 1927, which shows receipts of $47,685.43 and disbursements of $27,235.50, leaving a balance in the treasury of $20,449.93. On November 15 the first half of the taxes levied for operation and maintenance during 1928 became delinquent and the district expected to receive approximately $18,000 at that time.

Riverton Valley, Wyo., Shows What Can Be Done

As reported in the local press, big yields on the average on practically all the farms in the Riverton Valley this year are the general order, but it has remained for William Madden to establish a record for barley production that will stand for some time, it is believed.

On a 3-acre tract last spring Mr. Madden planted 300 pounds of Treby barley seed. The crop was threshed recently and, although the grower expected a good yield, the figures showed that it was beyond expectation. To be exact, 342 bushels of barley was the crop realized from the 3 acres, or 114 bushels per acre.

Mr. Madden has recently completed the harvesting of his sugar-beet crop. He had planted 12½ acres, and the result showed an average yield of 15 tons per acre. This figure stands after all tare had been figured out. The sugar content is reported higher this year than usual, exceeding 17 per cent in almost every instance.

Wind River Diversion Dam, Riverton Project, Wyo.

Onion Diet Seems to Make Turkeys Thrive

The lowly onion is one of the best foods for turkeys, according to Mrs. F. Keith, turkey grower living on a 20-acre farm near Nampa, Boise project, Idaho, as reported in a recent issue of the Nampa Leader-Herald.

"I raised 130 birds last year which netted $10.27 per bird," says Mrs. Keith. "I started them out on sour milk and a little bran mash. Later they roamed over a rented stubble field.

"About the 1st of November an onion field was left with the onions piled and unsold, and the turkeys lived on this until the onions were gone. I have never seen such thrifty fowls.

"This year I will have about 150 to market. The estimated cost of raising a turkey is less than $2. I believe the industry is in its infancy in Idaho, and I am convinced that a use for onions, which have been rejected on the market, may be found in feeding turkeys. Of course, about two weeks before market time the onion diet should be discontinued so that it does not taint the meat."

ABOUT 25 prospective purchasers from Northern Colorado were preparing to make a trip to the Belle Fourche project with a view to buying farms on the project.

Irrigated Wheat on the Shoshone Project, Wyoming

Reclamation Organization Activities and Project Visitors

DR. ELWOOD MEAD, Commissioner of Reclamation, gave a talk recently at the Harrington Hotel, Washington, D. C., before the Alpha Zeta Society, an honor society in agricultural colleges. Doctor Mead spoke on present policies in reclamation and also described his recent trip to Palestine.

R. F. Walter, chief engineer, made a field inspection trip during the month, visiting the Lower Yellowstone, Milk River, Sun River, Kittitas, Yakima, and Huntley projects.

Congressmen Louis C. Cramton, B. L. French, E. T. Taylor, and John Morrow spent two days on the Carlsbad project.

Senator Wesley L. Jones and Congressman Sam B. Hill were recent visitors on the Okanogan project.

W. G. Ide, in charge of settlement work for the Oregon State Chamber of Commerce, was a visitor on the Klamath project during the month.

Marshall R. Taylor, employed by the bureau from 1908 to 1925 as dragline operator and master mechanic, died on October 12 at Cle Elum, Wash. At the time of his death Mr. Taylor was in the employ of S. H. Newell & Co., one of the contractors on the Kittitas division, Yakima project. Mr. Taylor had been employed on the Umatilla, Klamath, North Platte, and Flathead (Indian) projects, and on the Sunnyside and Kittitas divisions of the Yakima project.

Lloyd Miller, president of the Yakima-Benton irrigation district, Sunnyside division, Yakima project, Washington, accompanied by N. C. Richards, are in Washington, D. C., for a few weeks in the interest of the project.

J. L. Lytel, superintendent of the Yakima project; Porter J. Preston, superintendent of the Yuma project; and Charles A. Engle, supervising engineer, Indian irrigation service, are in the Washington office in connection with the report on the recent survey of irrigation methods and practices.

Harold Conkling, formerly hydrographic engineer in charge of water supply studies and investigations in the Denver office, has been appointed chief of the division of water rights of the State of California.

Samuel G. Porter, who received his early training in the bureau on the North Platte project, has been appointed chief of the Canadian Pacific Railroad Company's department of natural resources, at Calgary, Alberta, Canada.

Fredrik Vogt, member of the Norwegian Engineering Society, who is in this country studying arch dams, was a recent visitor at the Denver office.

Barry Dibble, former project manager of the Minidoka project, visited the American Falls reservoir recently.

George C. Imrie, assistant engineer, American Falls dam, has been transferred to the Kittitas division of the Yakima project.

B. E. Hayden, assistant reclamation economist, spent a week on the North Platte project, conferring with the various districts in regard to the 1927 crop census.

The Oregon State Reclamation Commission, comprising Governor Patterson; Sam Kozer, secretary of state; Tom Kay, State treasurer; and Rhea Luper, State engineer and secretary to the commission, visited the Warmsprings district, Vale project, recently and inspected the drainage ditches which have been built and the results obtained in lowering the water table.

Members of the joint legislative committee on water resources of California, accompanied by the State engineer and others, visited Stony Gorge Dam, Orland project, recently. These visitors included Assemblymen B. S. Crittenden, Van Bernard, E. C. Adams, and Frank W. Mixter; Senators H. C. Nelson and William R. Sharkey; State Engineer Edward Hyatt, jr.; H. M. Stafford, of the division of water rights; George C. Mansfield, of the department of public works; Roy C. Goodwin, of the Sacramento Bee; R. C. E. Weber, superintendent, Orland project; George Sturm, president, Orland Unit Water Users' Association; J. J. Flaherty, of the First National Bank of Orland; G. A. Barceloux, Bank of Orland; H. M. Keene, editor of the Orland Unit; L. W. Wigmore, editor of the Orland Register; and C. A. Templeton, director, Orland Water Users' Association.

Among recent visitors to the Milk River project were Senator B. K. Wheeler, Congressman Scott Leavitt, C. D. Greenfield, agricultural agent, and A. H. Hogeland, consulting engineer of the Great Northern Railway.

President Sargent, of the Chicago & North Western Railway, together with the directors of the system and other official members, drove through the Lower Yellowstone project recently to view the industrial development and their new railroad to Vale. The party included three directors from New York and one each from Boston, Pittsburgh, Omaha, and Chicago.

Dr. F. L. Ransome, consulting engineering geologist, has completed his geological examination of Owyhee dam site.

C. M. Day, mechanical engineer, Denver office arrived at Boise at the end of the month to inspect the work being done on the balanced valves at Arrowrock dam.

D. W. Stuver and R. H. Fifield, engineers of the Puget Sound Bridge & Dredging Co., of Seattle, called at the Burley office of the Minidoka project to discuss plans for the development of the Murtaugh irrigation project. Other visitors were W. J. Martin, assistant supervisor of agriculture of the Union Pacific System, and George N. Carter, State commissioner of reclamation.

C. M. Day, mechanical engineer, and O. Greenberger, representative of the Worthington Machinery Corporation, have been conducting a series of tests on the pumping units of the Orchard Mesa plant, Grand Valley project, to determine the efficiency of replacement runners furnished by the company.

Recent visitors on the Yuma project and the Yuma Mesa included Senator Carl Hayden and Congressmen Cramton, French, and Taylor.

U. S. GOVERNMENT PRINTING OFFICE: 1927

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

HON. HUBERT WORK, SECRETARY OF THE INTERIOR

E. C. Finney, First Assistant Secretary; **John H. Edwards**, Assistant Secretary; **E. O. Patterson**, Solicitor of the Interior Department
E. K. Burlew, Administrative Assistant to the Secretary

Washington, D. C.

Elwood Mead, Commissioner, Bureau of Reclamation

Miss M. A. Schnurr, Secretary to the Commissioner — P. W. Dent, Assistant Commissioner — George C. Kreutzer, Director of Reclamation Economics

W. F. Kubach, Chief Accountant — C. A. Bissell, Chief of Engineering Division — Hugh A. Brown, Assistant Director of Reclamation Economics

C. N. McCulloch, Chief Clerk

Denver, Colorado, Wilde Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; E. B. Debler, Hydrographic Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; L. R. Smith, Chief Clerk; Harry Caden, Fiscal Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Youngblutt	R. C. Walber	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	R. J. Newell	W. L. Vernon		B. E. Stoutemyer	Portland, Oreg.
Carlsbad	Carlsbad, N. Mex.	L. E. Foster	W. C. Berger	W. C. Berger	H. J. S. Devries	El Paso, Tex.
Grand Valley	Grand Junction, Colo.	J. C. Page	W. J. Chiesman	C. E. Brodie	J. R. Alexander	Montrose, Colo.
Huntley	Ballantine, Mont	H. M. Schilling	J. P. Siebeneicher		E. E. Roddis	Billings, Mont.
King Hill [2]	King Hill, Idaho					
Klamath	Klamath Falls, Oreg	H. D. Newell	N. G. Wheeler	Joseph C. Avery	R. J. Coffey	Berkeley, Calif
Lower Yellowstone	Savage, Mont	H. A. Parker	E. R. Scheppelmann	E. R. Scheppelmann	E. E. Roddis	Billings, Mont.
Milk River	Malta, Mont	H. H. Johnson	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka [3]	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Portland, Oreg.
Newlands [4]	Fallon, Nev	A. W. Walker	Erle W. Shepard	Miss E.M.Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte [5]	Mitchell, Nebr	H. C. Stetson	Virgil E. Hubbell	L. J. Windle	Wm. J. Burke	Mitchell, Nebr
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	B. E. Stoutemyer	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lilliugstou	C. H. Lillingstou	R. J. Coffey	Berkeley, Calif.
Owyhee	Nyssa, Oreg	F. A. Banks			B. E. Stoutemyer	Portland, Oreg.
Rio Grande	El Paso, Tex	L. R. Fiock	V. G. Evans	L. S. Kennicott	H. J. S. Devries	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	R. B. Smith	Wm. J. Burke	Mitchell, Nebr.
Salt Lake Basin	Salt Lake City, Utah	E. O. Larson				
Salt River [6]	Phoenix, Ariz					
Shoshone [7]	Powell, Wyo	L. H. Mitchell	W. F. Sha		E. E. Roddis	Billings, Mont
Strawberry Valley [8]	Provo, Utah					
Sun River [9]	Fairfield, Mont	G. O. Sanford	H. W. Johnson	H. W. Johnson	E. E. Roddis	Do.
Umatilla [10]	Hermiston, Oreg					
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helin	J. R. Alexander	Montrose, Colo.
Vale	Vale, Oreg	H. W. Bashore	C. M. Voyen		B. E. Stoutemyer	Portland, Oreg.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	do	Do.
Yuma	Yuma, Ariz	P. J. Preston	H. R. Pasewalk	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

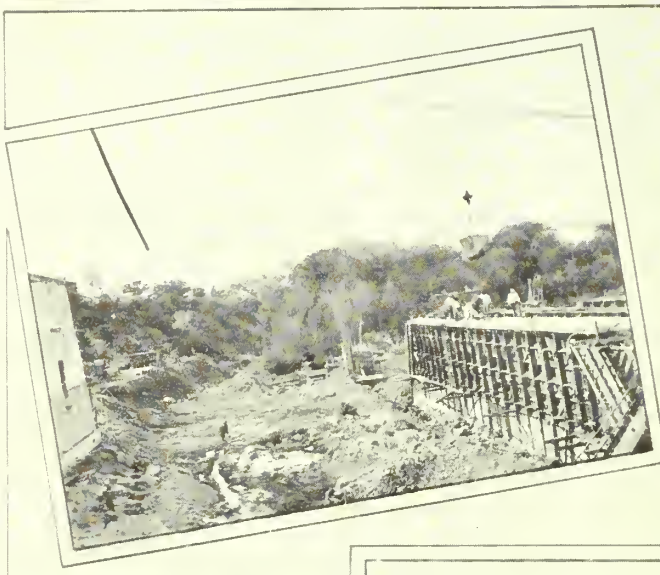
Large Construction Work

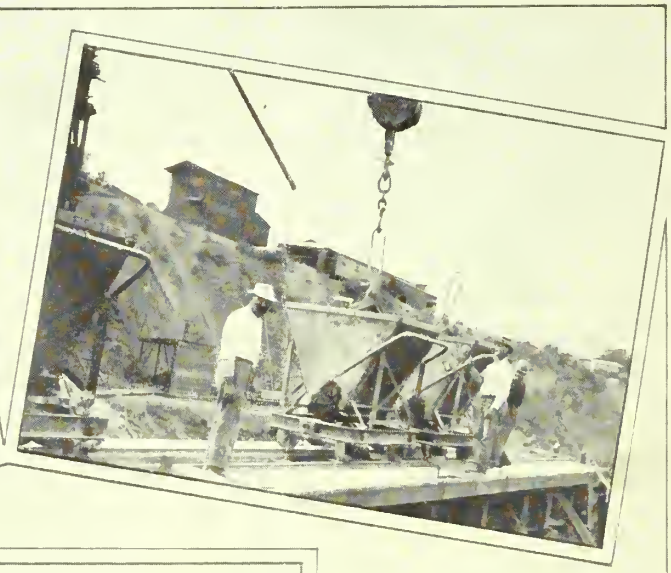
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [11]		L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Kittitas	Ellensburg, Wash	Walker R. Young [12]	E. R. Mills		B. E. Stoutemyer	Portland, Oreg.
Sun River, Gibson Dam.	Augusta, Mont	Ralph Lowry [12]	F. C. Lewis	F. C. Lewis	E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [12]	C. B. Funk		R. J. Coffey	Berkeley, Calif.

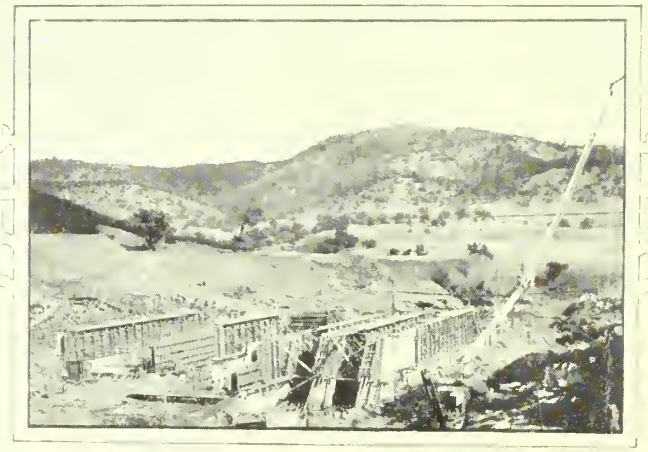
[1] Operation of Arrowrock Division assumed by Nampa-Meridian, Black Canyon, Boise-Kuna, Wilder, Big Bend, and New York Irrigation Districts on Apr. 1, 1926.
[2] Operation project assumed by King Hill Irrigation District Mar. 1, 1926.
[3] Operation of South Side Pumping Division assumed by Burley Irrigation District on Apr. 1, 1926, and of Gravity Division by Minidoka Irrigation District on Dec. 2, 1916.
[4] Operation of project assumed by Truckee-Carson Irrigation District on Dec. 31, 1926.
[5] Operation of Interstate Division assumed by Pathfinder Irrigation District on July 1, 1926, Fort Laramie Division by Goshen Irrigation District and Gering and Fort Laramie Irrigation District on Dec. 31, 1926, and Northport Division by Northport Irrigation District on Dec. 31, 1926.
[6] Operation of project assumed by Salt River Valley Water Users' Association on Nov. 1, 1917.
[7] Operation of Garland Division assumed by Shoshone Irrigation District on Dec. 31, 1926.
[8] Operation of project assumed by Strawberry Valley Water Users' Association on Dec. 1, 1926
[9] Operation of Fort Shaw Division assumed by Fort Shaw Irrigation District on Dec. 31, 1926.
[10] Operation of West Division assumed by West Extension Irrigation District on July 1, 1926, and East Division by Hermiston Irrigation District informally on July 1, 1926, and formally, by contract, on Dec. 31, 1926.
[11] Resident engineer.
[12] Construction engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Cache la Poudre investigations	Denver, Colo	Thomas Hawthorne	Poudre Valley Water Conservation Association.
Middle Rio Grande	Albuquerque, N. Mex.	C. C. Elder	Middle Rio Grande conservancy district.
Columbia Basin Project	Lind, Wash	B. E. Hayden	
Truckee River	Reno, Nev	A. N. Burch	
Heart Mountain investigations	Powell, Wyo	I. B. Hosig	
Southern investigations	Washington, D. C	George C. Kreutzer and C. A. Bissell	States of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee.



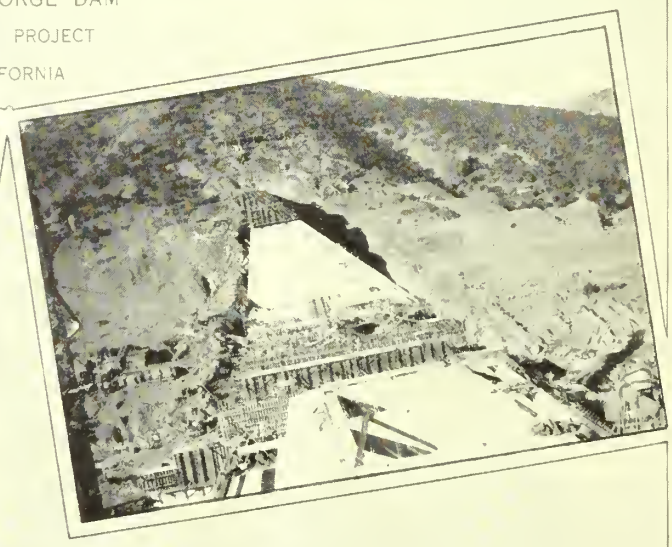




STONY GORGE DAM

ORLAND PROJECT

CALIFORNIA



1. EXCAVATION FOR BUTTRESSES 20 TO 29 IN SOUTH CHANNEL LOOKING WEST
2. BUTTRESS 18 CONCRETE BUCKET AND FARMS ON TOP OF FORMS
3. CENTER SECTION OF DAM SOUTH CHANNEL AT RIGHT
4. BUTTRESSES 49 TO 54 IN FOREGROUND LOOKING SOUTH
5. BUTTRESSES 19 TO 21 IN FOREGROUND LOOKING NORTH

I 27. 5: 1927 index

OCT. 1927

INDEX

NEW RECLAMATION ERA. VOLUME XVIII

For the year 1927

Page numbers for separate issues

No.	Month	Pages	No.	Month	Pages
1.	January	1–16	7.	July	97–112
2.	February	17–32	8.	August	113–128
3.	March	33–48	9.	September	129–144
4.	April	49–64	10.	October	145–160
5.	May	65–80	11.	November	161–176
6.	June	81–96	12.	December	177–192

A

Page

Accounting procedure in bureau as affected by recent legislation 172
Accretions to reclamation fund and expenditures for construction and operation of projects 176
Acid phosphate, aid to growth of alfalfa 46
Alfalfa, manure increases yield of irrigated 143
Alkali deposits prevented by irrigation and drainage 139
American Falls Dam dedicated 168
Reservoir district No. 2, contract with 155
Apple crop, million dollar on Tieton division 158
Appropriation act for 1928 61
estimates for Budget 76
Arch dams, experimental work on small-scale models 152
Argentine land settlement 137
Republic, colonization in 169
Australian reservoir has largest capacity 25

B

Baker project, Oregon, investigation 115
Belle Fourche project, economic notes from 103
asks credit legislation 165
plans for settlement 147
progress on 21
sugar factory seems assured 12
visit of President Coolidge 146
Bird Refuge, McKay Creek, Umatilla project 158
Black Canyon irrigation district, contract with 140
Boise project chicken industry 90
contract with Black Canyon irrigation district 140
contracts with irrigation districts 56, 108
drainage by pumping on 137
Bordeaux, proper mixing of 60
British settlements in Canada under the 3,000 families scheme 186
Brown, Benjamin, outline of the growth and future of the cooperative market 28
Bull associations, improve the dairy herd by 143

C

Page

California, farm electrification in 137
Canada, British settlements in 186
project "home place" plan 78
Canadian soldier settlement act 41
Carlsbad cotton makes three bales to acre 190
Charges collectible though water cut off 126
Claims on account of personal injury or death (Comptroller General's decision) 127
Clarendon, Earl of, and T. C. Macnaughten, British settlements in Canada 186
Colonization conditions in Peru 135
Colorado farm rents, taxes take one-third of 67
River development urged 34
discussion of, by seven State governors 155
Columbia Basin development, planning (Elwood Mead) 98
Comstock, H. D., Riverton project gatekeeper takes 11 first prizes for crops 164
Conference at Denver, March, 1927 36
report by R. F. Walter 66
southern, February 8, 1927 35
Construction program, 1927–28 71
Contracts with irrigation districts, address before Denver conference, March, 1927 92
Contracts with irrigation districts, Boise project 56, 108
landowners on Vale and Owyhee projects 102
Coolidge visits Belle Fourche project 146
Cooperation 138
of Federal Government and State in development of irrigation projects 18
Cooperative movement, outline of growth and future of 28
Cotton growing on Orland project 31
production on irrigation projects (1926) 58
record 68
Crawford *v.* Imperial Irrigation District (253 Pac. 726) 70
Creamery, what it means to irrigated farming community 72

77171—27

Ohio State College Library
Government Publications

Page

Crop and livestock census, regulations for taking 162
census determines average gross income 86
value, 10-year, $1,000,000,000 133
Crops, irrigated, worth $60,664,900 133

D

Dairy Cattle Credit Corporation, North Platte project 163
for North Platte project 131
two carloads arrive on North Platte project 163
herd, improve the, by bull associations 143
poultry, and bee industries 111
Damages, flood, payment on account of, to citizens near Hatch, N. Mex 51
Dams, arch, experimental work on small-scale models 152
Darlington, E. B., dedication of American Falls Dam 168
Day, C. M., Orchard Mesa pumping plant, Grand Valley project 188
Deadwood Dam studied by engineering board 134
Death or personal injury liability not assumed by United States 127
Debler, E. B., return flow and its problems on reclamation projects 124
Denver conference, March, 1927 36
report by R. F. Walter 66
Diploma and medal bestowed upon Bureau of Reclamation 126
Drainage and irrigation prevent alkali deposits 139
by pumping on Boise project 137
Dyer, G. W., poultry production a growing industry in western Colorado 88

E

Echo Dam contract award, Salt Lake Basin project 190
reservoir, Salt Lake Basin project, contract 122
Economic conference, Klamath County agricultural 132
data needed from southern farms 103
notes from Belle Fourche project 103
the projects 101, 130, 178
study of Minidoka project 107
Egypt, increased irrigation development in 174
Electrification of farms in California 137
Engineering board studies Owyhee, Deadwood, and Gibson Dams 134
Equipment and supplies, transfer of on reclamation projects 156
Era, New Reclamation, a means of speeding up settlement 190

F

Farm electrification in California 137
products, making the most of the 138
Farms, fixing size and shape of, according to topography 114
Faville, E. E., Hawaiian reclamation project on Molokai 45

Page

Feasible or not? What are the factors that decide? 15
Financial and economic conditions on reclamation projects 38
Fish in Elephant Butte Reservoir 173

G

German credit for colonization 91
Gibson dam 68
construction work 174
studied by engineering board 134
Glover, R. E., Guernsey surge tank, North Platte project 136
Goldman, E. A., the McKay Creek bird refuge 158
Grand Valley potatoes make excellent yield 109
project, Orchard Mesa pumping plant 188
Gravity extension unit of Minidoka project, contract 155
Guernsey surge tank, North Platte project 136

H

Harper, S. O., transfer of equipment and supplies on reclamation projects 156
Hauter, L. H., agricultural program for Rio Grande project 57
Hawiian conference on education, rehabilitation, etc 82
reclamation project on the Island of Molokai 45
Hayden, T. A., Salt River project creates railroad tonnage 130
Honduras, new water law 83
Houk, Ivan E., experimental work on small-scale models of arch dams 152
Huntley project, board of examiners on 30

I

India, irrigation in the Punjab 83
Irrigated area, United States, 1889-1919 141
world 142
crop rotations in western Nebraska studied 132
Irrigation and drainage prevent alkali deposits 139
district may make payment to agent to represent district before Congress 70
districts, contracts with, Denver address 92
of orchards 143
Italy, land settlement in 59

K

Klamath County agricultural economic conference 132
project, opening of Tule Lake division 149
Tule Lake lands opened to entry 40
Kreutzer, George C., dairy cattle credit corporation 163
recent improvements in conditions 38
Kubach, William F., accounting procedure as affected by recent legislation 172
preparation of appropriation estimates 76

L

Page

Lamb feeding demonstration on Uncompahgre project 106
Lawson, A. E., the Washington State Fair 181
Livestock and crop census, regulations for taking 162
inventory, reclamation projects 133
Lowell, J. H., the Boise project and the hen 90
Lowry, Ralph, construction work at Gibson Dam 174
Lytel, J. L., cold storage in Yakima Valley 23
economic notes from reclamation projects 178

Mc

McKay Creek bird refuge, Umatilla project 158
McKay Dam dedicated 123
design, construction, and detail cost 170

M

Madras Presidency, irrigation in 109
Manure increases yield of irrigated alfalfa 143
Martin, Enos D., necessity for making payments greatest blessing 37
Mead, Elwood, cooperation of Federal Government and State in development of irrigation projects 18
planning the Columbia Basin development 98
urges action on Colorado River development 34
Meat and refrigeration service on the Newlands project 183
Medal of honor and diploma received by bureau 126
Minidoka project, economic study of 107
gravity extension unit, contract 155

N

Nebraska, irrigated crop rotations in western, studied 132
Newell, R. J., railroad development in Snake River Valley 164
Newlands project meat and refrigeration service 183
most profitable crop, alfalfa 190
New South Wales, land settlement in 60
New Zealand finds readjustment needed 142
irrigation in 95
North Platte project, dairy cattle credit corporation 163
Guernsey surge tank 136
Pathfinder irrigation district contract 47
thoroughbred dairy cattle for 131
North Platte Valley, poultry tour in 79

O

Olin, W. H., facts about the Strawberry Valley project 110
Onion diet seems to make turkeys thrive 191
Opening to entry of Tule Lake lands 40, 149
Orchard irrigation 143
mesa pumping plant, Grand Valley project 188
Oregon has placed 2,600 settlers during past three years 117

Page

Organization activities and project visitors 16, 32, 48, 64, 80, 96, 112, 128, 144, 159, 175, 192
Orland, Calif., tenth annual Glenn County fair 42
project, cotton growing on 31
Stony Gorge Dam 52, 84
Owyhee and Vale projects, contracts with 102
dam studied by engineering board 134

P

Pan Pacific conference, Honolulu, April, 1927 80
on education, etc 82
Pathfinder irrigation district contract 47
Payette division, Boise project, contract with Black Canyon irrigation district 140
Personal injury or death liability may not be assumed by United States 127
Peru, reclamation and settlement in 142
Peruvian conditions for colonization 135
Pie, world's largest 187
Poultry growers, Uncompahgre, organize 141
industry in western Colorado 88
raising in Mesilla Valley 13
tour in North Platte Valley 79
Power development on Salt River project 111
Project women and their interests 10, 26, 44, 54, 104, 120, 138, 150, 166, 184
Propps, D. H., poultry tour in North Platte Valley 79
Punjab, India, irrigation in 83

R

Railroad development in Snake River Valley 164
Rattlesnakes relieve patrolman's monotony 142
Reclamation and settlement in Peru 142
report for May, 1927 109
Résumé of the Department of Interior (March, 1926–March, 1927) 51
Return flow and its problems on reclamation projects 124
Review of the month 1, 17, 33, 49, 65, 81, 97, 113, 129, 145, 161, 177
Right of way, sec. 3709, R. S., not applicable to contracts for purchase of 141
Rio Grande overflow, payment of damages to Hatch, N. Mex., citizens 51
project, agricultural program for 57
plans exposition 137
poultry raising in Mesilla Valley 13
Riverton project gatekeeper takes 11 first prizes for crops 164
Valley crops 191
Rotations, irrigated crop, in western Nebraska studied 132

S

Sacramento Valley project, report on 60
Salt Lake Basin project, Utah, construction type of Echo Dam 37
contract for construction of first division 122
Echo Dam contract award 190
first division approved by President 22

Page

Salt River irrigation project creates railroad tonnage 130
power helps pay for project 167
development 111
Sanford, George O., average gross incomes determined by crop census 86
points for the farmer to remember 190
when irrigation was young 29
Schnurr, Mae A., reclamation project women and their interests 10, 26, 44, 54, 104, 120, 138, 150, 166, 184
Sesquicentennial awards diploma and medal of honor to Bureau of Reclamation 126
Settlement and economic notes from the projects 101
reclamation in Peru 142
Argentine land 137
data 21
plans for, Belle Fourche project 147
Sheep from Orland project vie with those from Belle Fourche 50
Shoshone district in good financial shape 190
project, Willwood division, farm laborers' capital reduced to $500 116
South Dakota irrigated land in demand 149
Southern farms, economic data needed from 103
Pacific lines in southern Arizona 130
reclamation conference plans for future development 35
States progress report 118
Special advisers visit Southern States 3
Spry, Hon. William, pointing the agricultural way 12
State highway systems in reclamation States 127
Steele, Byrum W., Gibson Dam, Sun River project 68
design, construction, and detail cost of McKay Dam 170
Stony Gorge Dam, Orland project 52, 84
Stoutemyer, B. E., contracts with irrigation districts 92
Strawberry Valley project, facts about 110
water users' association contract 8
Sugar-beet production on the projects 40
Sun River project, contract with Greenfields irrigation district 24
Gibson Dam 68
Supplies and equipment, transfer of, on reclamation projects 156

T

Taxes by district, riparian lands subject to 187
take one-third of Colorado farm rents 67
Ten-year construction program for Federal reclamation 2
estimate of expenditures, etc 176

Page

Tieton division million-dollar apple crop 158
growers have fine crops 133
Trees suitable for roadside planting 139
Tule Lake division, Klamath project, opening 40, 149
Turkeys bring $10,000 to Sunnyside farmers 25
on Minidoka project 37

U

Umatilla project, McKay Creek bird refuge 158
Uncompahgre poultry growers organize 141
project, lamb feed demonstration 106
poultry raising 88
United States *v.* Parkins (Wyoming Federal District Court, 1926), 18 Fed. (2d), 643 126

V

Vale and Owyhee projects, contracts with 102

W

Walker, A. W., meat and refrigeration service on Newlands project 183
Walter, R. F., important construction in progress and proposed 71
land settlement on Federal reclamation projects 4
Washington State Fair, Yakima, Wash 181
Water charges collectible though water cut off by Government 126
Ways to go broke 143
Weber, R. C. E., cotton growing on the Orland project 31
Hampshire sheep from Orland project vie with those from Belle Fourche 50
tenth annual Glenn County fair, Orland 42

Y

Yakima Daily Republic editorial on the value of reclaiming additional land 119
project, Kittitas division, subdivision, and exchange of land in Badger Pocket 114
million-dollar apple crop 158
offers splendid opportunities to right people 14
prosperous 133
Valley, cold storage in 23
Yakima's $1,000 one-ton apple pie 187
Young, Walker R., economic notes from the projects 114
Youngblutt, F. C., plans for settlement, Belle Fourche 147
Yuma Mesa grapes bring $200 a ton 127
settlement and development of 116

U. S. GOVERNMENT PRINTING OFFICE: 1927