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NEW RECLAMATION ERA

VOL. 17 JANUARY, 1926 NO. 1

THE GROSS RETURNS IN 1925 FROM THE COTTON CROP ON THE RIO GRANDE PROJECT ALONE WERE MORE THAN $8,500,000, AN INCREASE OF MORE THAN $1,500,000 OVER 1924

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—RECLAMATION

THE NATIONAL GOVERNMENT is committed to a policy of reclamation and irrigation which it desires to establish on a sound basis and continue in the interest of the localities concerned. Exhaustive studies have recently been made of Federal reclamation, which have resulted in improving the projects and adjusting many difficulties. About one-third of the projects is in good financial condition, another third can probably be made profitable, while the other third is under unfavorable conditions. The Congress has already provided for a survey which will soon be embodied in a report. That ought to suggest a method of relief which will make unnecessary further appeals to the Congress. Unless this can be done, Federal reclamation will be considerably retarded. With the greatly increased cost of construction and operation, it has become necessary to plan in advance, by community organization and selective agriculture, methods sufficient to repay these increasing outlays.

The human and economic interests of the farmer citizens suggest that the States should be required to exert some effort and assume some responsibility, especially in the intimate, detailed and difficult work of securing settlers and developing farms which directly profit them, but only indirectly and remotely can reimburse the Nation. It is believed that the Federal Government should continue to be the agency for planning and constructing the great undertakings needed to regulate and bring into use the rivers of the West, many of which are interstate in character, but the detailed work of creating agricultural communities and a rural civilization on the land made ready for reclamation ought to be either transferred to the State in its entirety or made a cooperative effort of the State and Federal Government.

From the President's Message to Congress
December 8, 1925.

NEW RECLAMATION ERA

Issued monthly by the Bureau of Reclamation, Department of the Interior, Washington, D. C.

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 17 JANUARY, 1926 No. 1

HIGH LIGHTS IN A REVIEW OF THE MONTH

MONTROSE County, Colo., which includes the Uncompahgre project, entered 27 show samples in the pure seed show at Colorado Springs recently, and won 20 premiums, including one sweepstakes. The entries came very near winning two other sweepstakes.

THE Boise project reports that inquiries for farm lands are becoming more evident. On the Minidoka project better economic conditions are reflected in new buildings, fences, and other farm improvements. The sale of automobiles is increasing.

ABOUT 10,000 head of sheep and lambs are being wintered on the Grand Valley project. Range cattle are being fed under contracts for furnishing forage and pasture. This type of contract is of particular advantage to the farmers, not only through the sale of their products, but also by increasing the fertility of the soil. Many farmers are beginning to realize the necessity of feeding their hay and grain instead of selling their crops for cash.

The sheep-feeding industry has assumed large proportions on the Uncompahgre project, and it is estimated that about 40,000 head are being fed in the valley.

THE demand for dairy cows on the Boise project is active. With butterfat at 57 cents a pound and hay at $7 a ton, many farmers are making efforts to buy dairy cows and feed out some of their hay.

A carload of turkeys was shipped from Burley, Minidoka project, in November, containing 1,564 birds, for which the growers received $6,581. Two cars from Rupert, containing 4,400 turkeys, brought $14,000. About 120,000 range sheep and 20,000 feeder lambs are on the project.

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CATTLE and sheep feeding on the North Platte project is increasing steadily, and it is estimated that 10,000 head of cattle and 100,000 sheep will be fattened on the project during the winter.

UP to the end of November 2,260,000 cubic yards of embankment material had been placed in McKay dam, Umatilla project, at a unit cost of 44 cents, compared with the estimated cost of 50 cents.

SOME SPUD STORIES

Southern Idaho has been in the throes of marketing what is claimed to be a $24,500,000 crop of potatoes. Boise and Minidoka projects had their share, as is indicated by the following statements from the Idaho Statesman:

Colles Brothers, Minidoka project, sold 5,000 sacks of potatoes from their ranch for $12,000. Two thousand sacks grown by Frank Moench netted $5,500.

Albert Lee, Boise project, raised 35 acres of potatoes. On 25 acres he raised the early variety, which averaged 100 sacks per acre. On the other 10 acres of Gems he averaged 125 sacks per acre. Mr. Lee refuses to divulge what he received for his 3,750 sacks of potatoes. However, the return at $2 per sack would be $7,500 for 35 acres.

John D. Remsberg, Minidoka project, grew 8,400 sacks of potatoes on 35 acres. He sold 8,000 sacks for $3 a sack f. o. b., Rupert, netting him $24,000.

L. A. Newcomb, Boise project, has stored 11,000 bushels of potatoes, the product of his own 27 acres and some he purchased from neighbors. These are all early varieties. Figure the profit yourself.

THE Powell Creamery, Shoshone project, purchased 7,400 pounds of butterfat in November and manufactured 9,300 pounds of butter and 75 gallons of ice cream. Other purchasing agencies bought 4,400 pounds of butterfat. The Frannie division shipped 3,700 pounds of cream.

THE Amalgamated Sugar Co. on November 15 issued checks in the amount of $345,340 for beets delivered to the Paul factory, Minidoka project, in October. The Burley factory is not operating this year, and about $165,000 of the above sum went to South Side growers.

ABOUT six carloads of honey have been produced this season on the Minidoka project. The Mini-Cassia Honey Growers Association handles the marketing of most of this product and is holding a large part of it in the expectation of better prices.

APPROVAL has been given to the recommendation of the Commissioner of Reclamation that the Chief Engineer be authorized to notify the Utah Construction Co. in connection with the building of the American Falls dam, Minidoka project, that although the department is in favor of a high dam it could not be contracted for until Congress has authorized it; nevertheless, the contractor, if he so elects, may proceed with the high dam subject to later approval by Congress.

COMMISSIONER MEAD has approved and the irrigation district officials of the Lower Yellowstone project have authorized the expenditure of $7,500 to design and lay out a drainage system for the entire project to be paid for as operation and maintenance.

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CONFERENCE ON RECLAMATION AND LAND SETTLEMENT

Gathering of representatives of many organizations interested in the problems of land settlement fill two-day session with constructive addresses and discussion of relation of reclamation and settlement

AS this issue of the NEW RECLAMATION ERA goes to press the Conference on Reclamation and Land Settlement, called by Commissioner Elwood Mead and held in the spacious auditorium of the Interior Department, has just closed a two-day session, replete with beneficent possibilities for the future. It is perhaps too close to the conference to appraise at their true value the helpful results which are expected to flow from this gathering of men and women, called together from every section of the country and representing a large number of organizations, with the common tie of interest in the solution of the problems of land settlement in reclamation. It would, of course, be too much to expect complete unanimity of thought on the topics under discussion. Diverse opinions were expressed in the speeches and in the discussions which followed, yet at the close of the conference it was markedly apparent that the delegates were seeing the problems from a more nearly common point of view, that their thoughts were flowing in a more nearly common channel.

There was virtually unanimous acquiescence by the conference in the policy of the Secretary and Commissioner that the undertaking of new projects must depend upon feasibility based upon an exhaustive preliminary survey of economic factors.

Considerable discussion revolved around the question whether the surplusage in food production, to which attention was called by Secretary Jardine, should automatically put a stop to further reclamation development at the present time, the consensus of opinion apparently being that the relatively small annual increase in the productive area under reclamation projects which would be possible in accordance with the normal growth of the work would and could have little appreciable effect on the agricultural economics of the country as a whole. It was pointed out by Governor Campbell, a member of the board of survey and adjustments, that the gross value of the crops grown on the irrigation projects under the Bureau of Reclamation represented only about 1 per cent of the gross value of the crops grown in the United States as a whole; that these crops are as a rule consumed locally, are needed to meet the food requirements of a developing country, and do not come into competition with crops grown in other sections of the country.

Selection of settlers on the basis of approved qualifications met with the unanimous indorsement of the delegates, as did also their financial aid and direction during the early years of changing the raw land into producing farms. Diverse opinions were expressed as to whether this aid should come from the Federal Government or from the States, but that some aid from some source was necessary seemed obvious to all.

The possibility that a portion of the reclamation fund might be diverted from use in the Western States, from whose resources it is largely created, to the reclamation of swamp, cut-over, and abandoned land in other sections of the country roused a number of the Western delegates to oratorical heights in defense of their position that the money should be spent in the development of that part of the country from which the fund had sprung, but in the closing hour of the session Hugh MacRae, the distinguished colonizer from Wilmington, N. C., poured oil on the troubled waters by asserting that in his opinion the West should receive more money than it had been getting for this great work of developing its arid lands.

A feature of the conference was the reading by Doctor Mead, at the opening session of the conference, of that portion of the President's recent message to Congress relating to reclamation, which is reprinted on the inside cover page of this issue. Another interesting and what was referred to by the speaker as possibly an exotic feature of the conference was an address by Dr. Emanuel Neuman, secretary of the Palestine Foundation Fund, on the work done by the Jews in reclaiming Palestine. Informative and constructive addresses were made by Representative Louis C. Cramton, chairman of the Subcommittee on Appropriations for the Interior Department, whose broad, first-hand knowledge of reclamation by irrigation was reflected in his masterly analysis of the present situation; by Representative Addison T. Smith, of Idaho, whose scholarly defense of reclamation will long be remembered by the conference; and by Representatives E. O. Leatherwood, of Utah, Scott Leavitt, of Montana, Charles E. Winter, of Wyoming, C. B. Hudspeth, of Texas, and Senator John B. Kendrick, of Wyoming, each of whom discussed some phase of reclamation and its relation to the development of the West and the Nation with the skill of long and intimate acquaintance.

The conference was opened promptly at 10 o'clock on the morning of December 14 by Commissioner Mead. Secretary Work then welcomed the delegates and outlined the present situation from a national standpoint, his keynote being that the two real questions vital to the supremacy of this Nation are the conservation of our natural resources and the reclaiming of land lost to agriculture. His address appears in full in the supplement to this issue.

Hon. William M. Jardine, Secretary of Agriculture, followed with a short address in which he stressed the view that extensive reclamation at the present time is inopportune because of the surplusage in agricultural production, but pointed out that now is the time for an exhaustive survey of what may be needed in the future, so that a coordinated plan of agricultural development may result.

The stirring address of Representative Cramton, which appears in the supplement to this issue, followed. A few of the high points in Mr. Cramton's address which may be mentioned were that reclamation will succeed as a business proposition, in which connection he paid a high tribute to the constructive program of the Secretary and Doctor Mead; that there would be no question of success if the time spent by the water users in urging extensions of time in making repayments were spent on farming; that land must be made available to new settlers at reasonable prices; that there is need for some financing of settlers and some source of credit at a low rate of interest; and that inasmuch as a large part of the agricultural success of their future is tied up in the reclamation projects, the States should assume some of the responsibility of settlement and development.

Senator Kendrick stressed the point that the men who can pay their construction and operation and maintenance charges should meet their obligations to the Government, and that some of the elements of successful reclamation could be found in selection of settlers, community effort, financial aid and direction, preparation of the land by the Federal Government, and that the States should give moral and incidental aid in settling the projects.

The afternoon session was devoted to exceedingly interesting addresses by Dr. W. W. Long, of Clemson College of Agriculture, South Carolina, on the need of community organization; by John H. Guill, of the Federal Farm Loan Board, on credit needed in settlement and farm development; by Dr. A. M. Soule, president of the Georgia College of Agriculture,

on the economic importance of reclaiming the overflowed lands of Georgia; and by Prof. David Weeks, of the California College of Agriculture, on a land settlement policy, who suggested that a plan patterned after the California State land settlement act might be undertaken on a small scale as a demonstration by the Government.

Following the addresses came a general discussion, participated in largely by the representatives of the railroads, who indorsed the action already taken by the Secretary and Doctor Mead. The broad character of their viewpoint was reflected in the plea of John L. Cobbs, jr., of the Atlantic Coast Line, for an inventory of our national resources. Val Kuska, of the Chicago, Burlington & Quincy Railroad, spoke of the need of a definite policy in reclamation; E. F. Bension, of the Northern Pacific, stressed the need of aided and directed settlement; R. A. Smith, of the Union Pacific Railroad, questioned the desirability of opening up new projects at the present time; W. H. Olin, of the Denver & Rio Grande Western Railroad, discussed the question of what can be done with reference to the settlement of the older projects; and J. F. Jackson, of the Central of Georgia Railway, told of the possibilities of land settlement in the area served by his line provided suitable opportunities are made available for prospective settlers.

The evening session of the 14th, which was called to order at 7.30, opened with an address by Doctor Mead, illustrated by motion pictures and colored lantern slides, in which he contrasted the results of unplanned settlement on some of the more backward projects with what has been accomplished in other countries which have adopted a policy of aid to and direction of settlers. Doctor Mead's address is printed in full in the supplement.

Dr. John A. Widtsoe, chairman of the northern division of the board of survey and adjustments, then addressed the conference on the subject of smoothing the path of colonization, drawing his inspiration from the accomplishments of the early Mormon settlers in irrigation development and pointing out that from them we might obtain the guiding principles for future reclamation. These principles he enumerated as the selection of projects containing inherent qualities which will allow industrious, intelligent farmers to succeed; selection of settlers; community organization; the need of technical and financial help for settlers; and a spiritual appreciation of the fact that agriculture is not a business which must pay 6 or 10 per cent to be successful, but a mode of living.

The evening session was concluded by an address by Hugh MacRae, of Wilmington, N. C., on the land settlement problem of the South, in which he pointed out that perhaps the two greatest needs to permit of progress are a usable system for extending necessary credit to the farmer on a small acreage—a system created from the human viewpoint rather than from that of accepted financial usage; and a supply of skilled farm families who will act as leaders and demonstrators.

The session of December 15 opened at 10 o'clock with a scholarly address by Hon. E. C. Finney, First Assistant Secretary of the Interior, who stressed the points that the settlers must be educated to meet their debts when due, that contracts are made to be kept, and that selection of settlers is fundamental to a successful policy.

Following Mr. Finney's address came the interesting addresses, already mentioned, by Doctor Neuman and Representative Addison T. Smith. George C. Kreutzer, director of reclamation economics, then spoke on the problems of settlement of abandoned and unoccupied lands on existing Federal irrigation projects, pointing out the value of group settlements as demonstration areas. The final address of the morning session was made by Hon. T. E. Campbell, chairman of the southern division of the board of survey and adjustments, who clarified the divergent views of the conference with reflections based on long experience and intimate contact with the problems under discussion.

Doctor Mead then called on Prof. E. B. House, of the Colorado College of Agriculture, who responded with a brief talk whose central motif was the spirit of optimism. The next speaker, Frank C. Emerson, State engineer of Wyoming, deplored the misleading articles which

(Continued on page 4)

A group of delegates attending the Conference on Reclamation and Land Settlement

DELEGATES REPRESENT ALL SECTIONS OF COUNTRY

The list of delegates printed below indicates the widespread interest in the fundamental factors which spell success or failure in reclamation and land settlement

(Continued from page 3)

have appeared recently in eastern magazines decrying reclamation, asserted that this is the time for abundant optimism, and expressed the belief that reclamation development should not be stopped.

The afternoon session was presided over by Howard Elliott, the distinguished chairman of the Northern Pacific Railway. The first address of this session was given by Representative E. O. Leatherwood, of Utah, who stated that reclamation has amply justified itself, made a plea for constructive reclamation legislation, and asserted that the States must cooperate on settlement problems with the Federal Government.

Representative Scott Leavitt, of Montana, spoke on the subject of making established reclamation projects a success, pointing out that it is our duty to figure out what is wrong and then to take proper action.

Representative Charles E. Winter, of Wyoming, gave the legal history of the public lands. He stated that the reclamation policy of development of new projects should not be retarded, and that every settler who can pay should be forced to pay his charges when due. Mr. Winter indorsed Federal aided and directed settlement, but asserted that State aid was impracticable and that insistence on this policy would result in retarding reclamation several years.

Representative C. B. Hudspeth, of Texas, spoke on the time and expense of developing projects and gave an interesting account of the value of reclamation in the Rio Grande Valley, stressing the 100 per cent annual repayments on the project following a request for deferments which he refused to indorse. He believed that no new projects should be begun until it was shown conclusively that every cent of their cost would be returned.

The final speaker of the afternoon was Rhea Luper, State engineer of Oregon, who spoke on the subject of Oregon's reclamation problems, and pointed out that when projects are selected on the basis of merit there are not so many failures among settlers.

The conference adjourned with the statement by Doctor Mead that its purpose was personal contact, with an exchange of views and experience, and that purposely no provision had been made for the presentation of resolutions or reports.

In the supplement to this issue will found the nontechnical addresses delivered at the conference. Digests of other addresses are included in this issue or will appear in later issues.

A list of the delegates to the conference follows:

LIST OF DELEGATES ATTENDING THE CONFERENCE ON RECLAMATION AND LAND SETTLEMENT—DECEMBER 14 AND 15, 1925

Amory, Copley, expert in reclamation economics, Bureau of Reclamation, Washington, D. C.

Amory, Mrs. Copley, 1811 Q Street, NW., Washington, D. C.

Arentz, Hon. Samuel S., Nevada, House of Representatives, Washington, D. C.

Bailey, F. J., Bureau of the Budget, Treasury Department, Washington, D. C.

Baker, Charles H., Chicago, Burlington & Quincy Railroad, Transportation Building, Washington, D. C.

Behh, E. C., Federal Power Commission, Washington, D. C.

Benson, E. F., Northern Pacific Railroad, Seattle, Wash.

Benson, Mrs. E. F., Tacoma, Wash.

Bonnell, George, Chicago & North Western Railroad, Chicago, Ill.

Brewer, E. E., Chicago, Milwaukee & St. Paul Railroad, 796 Union Street, Chicago, Ill.

Brookings, W. Du B., natural resources department, United States Chamber of Commerce, Washington, D. C.

Brown, Hugh A., chief, division of settlement and economic operations, Bureau of Reclamation, Washington, D. C.

Brown, Raymond K., Secretary of State, island of Hawaii.

Browning, James L., South Carolina legislative committee, Columbia, S. C.

Burke, Charles H., Commissioner of Indian Affairs, Department of the Interior, Washington, D. C.

Burlew, E. K., administrative assistant to the Secretary of Interior, Washington, D. C.

Campbell, Hon. Thomas E., chairman, southern board of survey and adjustments, Bureau of Reclamation, Washington, D. C.

Cardwell, G. A., Atlantic Coast Line, Wilmington, N. C.

Cobbs, John L., jr., Atlantic Coast Line, Wilmington, N. C.

Cooley, A. C., agriculturist in charge of office of demonstrations on reclamation projects, Department of Agriculture, Washington, D. C.

Cramton, Hon. Louis C., Michigan, House of Representatives, Washington, D. C.

Crawley, K. T., Chesapeake & Ohio Railroad, Richmond, Va.

Dent, Porter W., assistant to the commissioner, Bureau of Reclamation, Washington, D. C.

Dern, Hon. George H., Governor of Utah, Salt Lake City, Utah.

Donald, Wm. J., secretary to Secretary Work, Department of the Interior, Washington, D. C.

Drummond, W. I., American Farm Congress, Kansas City, Mo.

Elliott, Howard, Northern Pacific Railroad, New York City.

Emerson, Frank C., Wyoming State engineer, Cheyenne, Wyo.

Farrell, George E., United States Department of Agriculture.

Finney, E. C., First Assistant Secretary of the Interior, Washington, D. C.

Fitch, T. J., inspector, Department of the Interior Washington, D. C.

Fly, Col. B. F., representing Yuma Mesa, Yuma, Ariz.

Folliard, Edward T., Washington Post, Washington, D. C.

Fondren, H. C., Southern Pacific Railroad, Majestic Hotel Building, Lake Charles, La.

Fox, E. B., Bureau of the Budget, Treasury Department, Washington, D. C.

French, Hon. Burton L., Idaho, House of Representatives, Washington, D. C.

Gartland, J. F., chief inspector, Department of the Interior, Washington, D. C.

Golihart, S. R., jr., Secretary of United States Employees' Compensation Commission, Washington, D. C.

Gooding, Hon. Frank R., Idaho, United States Senate, Washington, D. C.

Goodwin, Hon. F. E., member, board of survey and adjustments, Mills Building, Washington, D. C.

Greenfield, C. I., Great Northern Railroad.

Greer, F. W., Imperial irrigation district, El Centro, Calif.

Grunwald, Kurt, consulting agricultural engineer, American Farm Congress, Medford, Long Island, N. Y.

Guill, John H., Federal Farm Loan Bureau, Treasury Department, Washington, D. C.

Hancock, E. T., Bucharest, Rumania.

Hart, R. B., Caruthersville, Mo.

Havell, F., Assistant Commissioner, General Land Office, Department of the Interior, Washington, D. C.

Haw, J. W., Northern Pacific Railway, St. Paul, Minn.

Hayden, Hon. Carl, Arizona, House of Representatives, Washington, D. C.

Henderson, Miss B., Department of Agriculture.

Hill, John Wesley, Lincoln Memorial University, Cumberland Gap, Tenn.

Hodges, LeRoy, Virginia State chamber of commerce, Richmond, Va.

Holroyd, H. B., Louisville & Nashville Railroad, Louisville, Ky.

House, Prof. E. B., Colorado College of Agriculture.

Hudspeth, Hon. C. B., Texas, House of Representatives, Washington, D. C.

Jackson, J. F., Central of Georgia Railway, Savannah, Ga.

Jardine, Hon. William M., Secretary of Agriculture, Washington, D. C.

Jones, Randall L.

Kelly, R. E., Southern Pacific Railroad, San Francisco, Calif.

Kendrick, Hon. John B., Wyoming, United States Senate, Washington, D. C.

King, Garnett, Southern Pacific Railroad, 65 Market Street, San Francisco, Calif.

Kreutzer, George C., director of reclamation economics, Bureau of Reclamation, Wilda Building, Denver, Colo.

Kuhach, W. F., chief accountant, Bureau of Reclamation, Washington, D. C.

Kuska, Val, Chicago, Burlington & Quincy Railroad, Chicago, Ill.

Lamson, J. B., Chicago, Burlington & Quincy Railroad, 547 West Jackson Boulevard, Chicago, Ill.

Lawson, L. M., superintendent, Rio Grande project, Bureau of Reclamation, El Paso, Tex.

Leatherwood, Hon. E. O., Utah, House of Representatives, Washington, D. C.

Leavitt, Hon. Scott, Montana, House of Representatives, Washington, D. C.

Leedy, E. C., Great Northern Railway, St. Paul, Minn.
Long, Dr. W. W., Clemson College of Agriculture, Clemson College, S. C.
Luper, Rhea, Oregon State engineer, Salem, Oreg.
McBride, J. M., Seaboard Air Line, Savannah, Ga.
McCrory, S. H., division of agricultural engineering, Bureau of Public Roads, United States Department of Agriculture.
McDermith, Oro, Kittitas reclamation district, Ellensburg, Wash.
McEwen, J. E., Genesee, N. Y.
McKee, Paul B., California-Oregon Power Co., Medford, Oreg.
McMurtry, J. P., Prescott, Ariz.
McNeely, J. H., assistant to the Secretary, Department of the Interior, Washington, D. C.
MacRae, Hugh, banker, Wilmington, N. C.
Mather, Stephen T., director, National Park Service, Department of the Interior, Washington, D. C.
Mead, Elwood, Commissioner, Bureau of Reclamation, Washington, D. C.
Merrill, O. C., executive secretary, Federal Power Commission, Washington, D. C.
Morgan, O. S., Columbia University.
Neumann, Emanuel, national director, United Palestine Appeal, 114 Fifth Avenue, New York City,
Oddie, Hon. Tasker L., Nevada, United States Senate, Washington, D. C.
Olin, W. H., Denver & Rio Grande Western Railroad, 237 Equitable Building, Denver, Colo.
Oliphant, A. C., unofficial representative, American Engineering Council.
Pound, Earl C., Brawley, Calif.
Price, W. E., Southern Railway, Washington, D. C.
Reed, W. M., chief engineer, Indian irrigation service, Department of the Interior, Washington, D. C.
Robertson, Miss Alice M., Muskogee Daily News, Muskogee, Okla., Cairo Hotel, Washington, D. C.
Rogers, C M., Daytona, Fla.
Schmitt, F. E., Engineering News-Record, McGraw-Hill Co. (Inc.), Tenth Avenue at Thirty-sixth Street, New York City.
Schnurr, Miss Mae A., secretary to Commissioner of Reclamation, Washington, D. C.
Scofield, C. S., Department of Agriculture.
Seitz, Prof. C. E. Virginia Agricultural and Mechanical College, Virginia Polytechnic Institute, Blacksburg, Va.
Shelby, Mrs. Gertrude Mathews, 1 West Sixty-seventh Street, New York City.
Smith, Hon. Addison T., Idaho, House of Representatives, Washington, D. C.
Smith, George O., agricultural service, United States Chamber of Commerce, Washington, D. C.
Smith, R. A., Union Pacific Railroad, 1416 Dodge Street, Omaha, Nebr.
Smoak, W. W., Walterboro, S. C.
Soelberg, Earl J., livestock interests, Idaho Falls, Idaho.
Soule, A. M., president Georgia College of Agriculture, Mechanic Apartments, Athens, Ga.
Spry, Governor William, Commissioner of the General Land Office, Department of the Interior, Washington, D. C.
Stafford, C. B., chamber of commerce, Casper, Wyo.
Summers, Hon. John W., Washington, House of Representatives, Washington, D. C.
Taylor, Hon. Edward T., Colorado, House of Representatives, Washington, D. C.
Teele, R. P., Bureau of Agricultural Economics, Department of Agriculture.
Thomas, C. R., secretary, National Drainage Congress.
Tigert, J. J., Commissioner of Education, Department of the Interior, Washington, D. C.
Tredway, F., Southern Pacific Railroad.
Walker, Governor Clifford, Atlanta, Ga.
Wallace, W. R., Salt Lake City, Utah.
Walter, R. F., chief engineer, Bureau of Reclamation, Wilda Building, Denver, Colo.
Warburton, C. W., Department of Agriculture.
Weeks, Prof. David, University of California, Berkeley, Calif.
Westervelt, E. M., Chicago, Burlington & Quincy Railroad, Lincoln, Nebr.
Widtsoe, Dr. John A., chairman, northern board of survey and adjustments, Bureau of Reclamation, Washington, D. C.; also Utah Agricultural College, Salt Lake City, Utah.
Willard, E. V., State commissioner of drainage and waters, Old Capitol Building, St. Paul, Minn.
Wilson, M. L., Montana State College, Bozeman, Mout.
Winslow, F., United States Chamber of Commerce, Washington, D. C.
Winter, Hon. Charles E., Wyoming, House of Representatives, Washington, D. C.
Winter, Mrs. Charles E., 1671 Madison Street, Washington, D. C.
Wooton, Paul, McGraw-Hill Engineering Publications.
Work, Hon. Hubert, Secretary of the Interior, Washington, D. C.

ESSENTIAL FEATURES OF A LAND-SETTLEMENT PLAN

By Prof. David Weeks, College of Agriculture, University of California

(The following is a brief digest of an address delivered by Professor Weeks before the Conference on Reclamation and Land Settlement, December 14, 1925.)

THE following may be enumerated as the essential features of a land-settlement plan:

1. To be successful a land-settlement plan must be a part of a reclamation policy which recognizes the need of completing a job once it is started.

2. Only settlers who are qualified by experience, desire to farm, and who have some capital should be allowed to purchase land on reclamation projects.

3. Farm surroundings must be made attractive if desirable settlers are to be expected to undertake the development of these farms.

4. Stipulations must be made with large landowners in advance of launching the settlement program in any locality whereby the price of land will be held at levels which will make economic development possible.

5. Land should be classified according to its productive power and according to its adaptation.

6. Careful consideration must be given to types of agriculture and to the farm program.

7. A plan of financing agricultural development is essential to any plan of land settlement.

8. Any plan for the financing of agricultural development must consider well-established principles of safe investment which have developed through years of experience by our credit institutions. It is necessary to supply credit on more liberal terms than custom has decreed safe and at the same time institute measures which will provide that security which is lacking in the settler's equity in his new irrigated farm. Under conditions of small equity the only means of providing the same security which prevails in the ordinary mortgage loan is a contract for planned agricultural development capable of being rigidly enforced between the colonizing agency and the settler.

9. Individual advice and direction of farmers unacquainted with problems of agricultural development and general farming practices in an irrigated region are not only desirable but essential.

10. More recognition must be given in the future to fluctuations in business conditions and prices of products bought and sold by the farmer.

11. Any plan of land settlement must recognize the democratic spirit which prevails among the farmers of this country and the institution of local self-government which has become universal throughout the Nation.

12. It will probably be necessary for the Government to take an active part in the agricultural development of the projects created with Federal funds.

Professor Weeks discussed the California land-settlement plan, the important features of which provide for administration by a land-settlement board, purchase by the State of raw land in a body of suitable size for colonization, selection of settlers, small first land payment by the settler, soil mapping, planning subdivision on the basis of soil analysis and topographic features, loans for improvements, loans for purchase of livestock and equipment, low rate of interest, opportunity for recreation and social activities, facilities for cooperation, agricultural engineering, and business advice to settlers.

Professor Weeks suggested that a plan patterned after the California State land-settlement act might be undertaken on a small scale as a demonstration by the Government, pointing out that the community plan should be followed for the following reasons:

1. Pioneering in irrigation is too big a job for one man.

2. People are not willing to settle on isolated tracts without neighbors.

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THE LAND SETTLEMENT PROBLEMS OF THE SOUTH

By Hugh MacRae, Wilmington, N. C.

(The following is a brief summary of the address delivered by Mr. MacRae before the Conference on Reclamation and Land Settlement, December 14, 1925)

THE South's land settlement problem is the problem of its future standard of civilization—of the well-being of its people—and thus, in a broad sense, the problem of the South, like that of the West, is national.

The perpetuation of our national institutions depends on a contented, virile rural population. Farming of a type which will provide contentment and happiness has now become a science and must receive general recognition as such. Tenant farming, except in instances so rare that they can be disregarded, is neither a science nor an art It is a short cut, as time runs, to impoverishment of the land, the man on it, the landlord, and the Nation.

The problem is not to produce more cotton and more corn, not to compete with the present standards of agriculture, but to introduce new types of farming, and farmers who will diversify and make full use of the potentialities of soil and climate—men who love the land, who work scientifically, and who have been taught the economies of scientific farming through generations of old world necessities.

In actual practice, and so far as the experimental work in which I have been interested has gone, these exact benefits have developed. They are open to investigation by those who are interested in reaching a solution of this problem. The intensive farmer, occupying small acreage which he owns himself, diversifies and competes not at all with the staple crops of the country. He develops entirely new sources of wealth for the section, and his beneficial influence extends to others. He employs the negro to good advantage, teaches him through experience better farm practices, and pays him double the wages which he had previously received as a farm hand.

The whole problem of land settlement and creating an agriculture which will appeal to people must be divested of exploitation. It is first, last, and all the time a human problem. The future of the family must not be measured in acres, nor in its value in dollars to others, but in its own well-being.

Farm communities, as contrasted with scattered farms, are so advantageous from every economic, scientific, and social standpoint that it seems queer we should even think of trying to settle land under any other method.

Perhaps the two greatest needs to permit of progress are—

(1) A usable system for extending necessary credit to the farmer on small acreage—a system created from the human viewpoint rather than from that of accepted financial usage.

(2) A supply of skilled farm families who will act as leaders and demonstrators.

Another problem is who is going to do the land settlement work? Who is going to maintain and possibly rebuild country life? If corporations undertake it with the principal thought of making profit, the families will fail. If they undertake it altruistically under present conditions, the corporations will fail. The possible profit will not pay for the necessary service and the overhead expense incident thereto.

Certainly until the public mind can be opened to this national need and until the principles of successful land settlement can be demonstrated to a point of general acceptance and appreciation, there will be needed cooperation between the Government and States and individuals. We need first to be shown that reclamation is one-tenth engineering and nine-tenths human; second, that every person in the United States should be interested in its successful outcome. The professional man and the banker are just as much interested as the commission man or the man who owns railroad securities.

The several departments of Government, with the help of the statesmen in Congress and with all available ability focused on this problem, can initiate a program which will result in a satisfactory solution. A new era can be started in country life, so that farming will be respected as a scientific vocation and one in which the standard of living will be conducive to contentment.

LAND SETTLEMENT PLAN

(Continued from page 5)

3. They must have confidence that their immediate neighborhood will settle quickly.

4. Financing, administration, and advice are facilitated.

5. Cooperation is more effective.

6. Unit costs of some large-scale undertakings are less than when done on a small scale.

SOUTHWIDE CONFERENCE INDORSES RECLAMATION

The following resolution was adopted at the Southwide conference held in Birmingham, Ala., October 28 and 29, which was attended by Commissioner Mead:

"Whereas the relation of man to land is the fundamental economic and social question, and as all human experience shows this relation should be that of home and farm ownership, it becomes the duty of government to promote such ownership among its citizens, and

"Whereas the more easily available land has passed into the possession of private owners, it becomes the Government to make available other types of land for farm purposes; therefore be it

"*Resolved*, That this conference of southern governors and representatives from the Southern States go on record that reclamation by the Federal Government should proceed with reference to the problem to be solved and without reference to State or sectional lines. The same service and assistance, in proportion to need, should be available to each problem and the people of each such area; and be it

"*Further resolved*, That a copy of this resolution be furnished the Secretary of the Interior and all Senators and Congressmen."

SUN RIVER PROJECT BOY WINS WITH STEER

Elvin Barkoff, of Simms, Mont., son of one of the substantial farmers on the Sun River project, is making a name for himself as a raiser of prize-winning stock.

A yearling steer raised by Elvin recently won first prize at the North Central Corn and Livestock Show. He also won first in the boys' and girls' club work and first in the open classes. His premiums amounted to about $65.

The steer at a little more than 1 year of age weighed 1,060 pounds and was sold to the Great Falls Meat Co. for $86.

Aside from winning these substantial amounts of money, Elvin has stored up some very valuable experience in caring for stock.

FROM THE "QUESTION BOX"

A NUMBER of questions were dropped in the "Question box" provided at the conference on reclamation and land settlement held in the Interior Department on December 14 and 15. The questions and answers to them are printed below:

Question.—If there is overproduction, why are things so high?

ANSWER.—The selling prices of agricultural commodities to consumers are generally high because of the high cost of distribution. Delivery services by merchants for trivial purchases add to the cost of commodities. Much of the distribution is unorganized in large centers. For example, it costs more to distribute a bushel of apples in New York than the freight on it from the State of Washington to New York. Likewise, the cost of distributing milk is often more than the price received by the farmer who produced it. Much has been done by farmers' cooperative marketing associations, but still more should and can be accomplished.

Question.—Just what steps can or should colonization men of carrier lines take to assist most efficiently in now settling reclamation projects?

ANSWER.—The first step should be to assist in the organization of the community for the purpose of colonization. This would include securing the cooperation of chambers of commerce, farm bureaus, and other interested groups, so that options may be obtained on desirable farms for sale at reasonable prices and under satisfactory purchase terms. Assistance should be provided for advertising these opportunities and field men should be assigned to obtain settlers. The advertising matter should be true as to facts and describe definite farms for sale. Excursion rates to projects having an active settlement program would be helpful.

Question.—When is it probable that the interest rate on Federal farm loans may be lowered?

ANSWER.—The interest rate on these loans is dependent on the interest rate of the bonds sold by the Federal land banks. It is also dependent on the amount of real estate acquired by the land banks through foreclosure of mortgages. The loans tied up in these lands are a frozen asset until liquidated. The interest rate of the bonds is dependent on the bond market. Until land banks have disposed of their real estate very little change in the interest rate of Federal farm loans can be anticipated.

Question.—Can a uniform plan be equitably applied for the adjustment of present difficulties with settlers on the irrigated projects, or do the conditions for each differ making such an idea impracticable?

ANSWER.—Different projects require that different methods be employed to solve the problems existing on them. One project's greatest need may be settlers, another may face serious marketing problems because of transportation difficulties, and others may need drainage and soil improvement. Each project has special problems requiring special consideration.

Question.—What effect on the reclamation problem will the interest in agriculture shown by the President in his recent message have?

ANSWER.—It should have a favorable influence on working out the problems of reclamation.

Question.—Describe the settlement methods of Wisconsin.

ANSWER.—Although there are many different types of colonization enterprises in Wisconsin the plan generally referred to may be briefly described as follows: One large company purchased four tracts of land in 1917 aggregating 133,000 acres for colonization purposes. The main features are planned community development, repayment terms spread over 30 years, with interest at 7 per cent. Houses which cost from $500 to $850 are built by the company on farms. Two experienced field men give advice and service to settlers. Special inducements are made to expert farmers in specialized lines. Other companies are operating on similar lines. Financing is accomplished through mortgages which become the security for bonds which are approved by State authorities.

Question.—Describe the economic and State land soil surveys of Michigan.

ANSWER.—The surveys recently made in Michigan are combined economic and soil surveys for the purpose of determining what use shall be made of large areas of land which have reverted to the State through forfeited tax titles. The field data recorded by the surveyors include soil identification and distribution; character of surface and drainage; vegetation cover; economic conditions; resort and recreational possibilities; water-power resources; geological data; and stream data for fish, fur, and game. It is an inventory of natural resources and the economic factors involved to determine how the land may best be utilized.

SPUDS BY THE YARD, IN KITTITAS VALLEY

F. A. Kern, secretary of the Kittitas reclamation district, Washington, sends us the accompanying illustration showing some potatoes raised in the Kittitas Valley this year by R. E. Dyer.

Mr. Dyer produced 205 tons on 15 acres and was offered $60 a ton for the crop. This is an average of 13⅔ tons of potatoes an acre and $820 an acre gross return.

Oro McDermith, who was in the Washington, D. C., office when the illustration arrived, adds that 1,155 potatoes weighed a ton.

Potatoes from Kittitas Valley, Washington

RESOLUTIONS READ AT CONFERENCE

THE following resolutions were read at the conference on reclamation and land settlement, held in the Interior Department December 14 and 15, and were made part of the record, no further action being taken on them:

BY THE WESTERN RAILROADS

Whereas the various representatives of the western railroads having gathered to participate in the reclamation conference at Washington, D. C., December 14 and 15, 1925, it is hereby by them

Resolved, That they urge the Interior Department and the Commissioner of Reclamation to adopt a definite policy as to terms of the total construction charges for all western reclamation projects; and be it further by them

Resolved, That they promise their fullest cooperation in aiding the colonization of these lands in reclamation districts through solicitation, advertising, or any other method within their power.

BY THE SOUTHERN RAILROADS

The representatives of the railroads attending this conference approve the expressed policy of the Secretary of the Interior and of the Commissioner of the Bureau of Reclamation to put reclamation projects on a businesslike basis.

If and when the appropriation of $100,000 for investigational purposes mentioned by the Secretary becomes available, the railroads represented urge that exhaustive studies should be made of the matters of land utilization and settlement in the South.

BY HUGH MACRAE, WILMINGTON, N. C.

Resolved, That the Senators and Representatives in Congress be requested to amend the present restrictive immigration law, of which we approve in its general provisions, so that it will also be selective;

Further, that we ask our Senators and Representatives in Congress that they so amend the law that it will permit of the entry of persons skilled in agronomy, forestry, horticulture, or animal husbandry, under provisions as follows:

(*a*) In the issuance of immigration certificates preference shall be given by the consuls to persons who furnish satisfactory evidence that they are skilled in agronomy, forestry, horticulture, or animal husbandry, and who are going to the United States for the purpose of entering into agriculture, and to experienced farm laborers who are going to some agricultural district to engage in farming; that they shall be officially certified as to character and training in their own country, and they and their children shall have been taught the English language.

(*b*) Whenever the legislature or the governor of a State makes a request of the Secretary of Labor for farmers or skilled farm laborers who are expert in agronomy, forestry, horticulture, or animal husbandry, of any nationality, for the purpose of filling a specific need in that State, the Secretary of Labor, with the Secretary of Agriculture, may make a review of the situation, and upon their approval the desired skilled farmers or experienced farm laborers who have received the certificate provided for in paragraph (*a*) may be admitted, subject to such regulations as will insure that they go to the specified localities, and under these conditions the said skilled farmers or expert farm laborers shall not count against the quota of the nationality involved.

FARMERS, INVENTORY AND APPRAISE ALL YOUR LIVESTOCK, II

WE have previously urged our farmers to view their relations to their sons who are to help and later succeed them on the farm with a serious purpose to develop their youthful and latent character and abilities as "farmers in the making." They are, indeed, the most precious of all farm livestock, in comparison with which the single Aberdeen Angus fat steer which sold at Chicago recently for beef for over $5,000 is scarcely worth inventory and appraisal.

There must be impressed upon these boys the meaning of farm life and of its certain advantages, for we may be sure its too apparent disadvantages will not fail to be brought to and exaggerated for their attention.

Then there may be other son or sons whose fitness is not for farm life, and whose character and ability may be worthy but lie in another direction. When first their father sees or feels the unfitness of a son to be his helper or successor his disappointment is natural and inevitable. A sober second thought must bring conviction, however, that the relation of mutual confidence and sympathy must be maintained in the interest of the farmer and his farm, as well as in the interest of his boy destined sooner or later to go forth to seek his fortune.

That this is for the true interest of the farmer and his farm a moment's thought must convince.

As the boy becomes established and sees about him in mill, factory, or office all the orderly and complicated processes of modern business, he is able, little by little, to contribute to his father's knowledge of business the broader and clearer views which his horizon, far wider than his father's, affords.

To village and county politics the boy can soon add a glimpse of those wider and, to his father, more obscure politics of the State and Nation.

To his father's often narrow social circle the boy can soon add from experience and observation his views of how different classes live and move and of their relation to each other.

These impressions of our business, political, and social systems which the son can impart in discussion on his home visits must leave behind, if the younger man's view is clear, more faith on his father's part in the justice and equity of our civilization. They will soften some convictions, release some prejudices, produce better understanding, and conduce to a more abiding confidence in the vast and complex system of which we are each and all an integral but tiny part.

That this mutual confidence and sympathy is in the interest of the son is equally obvious.

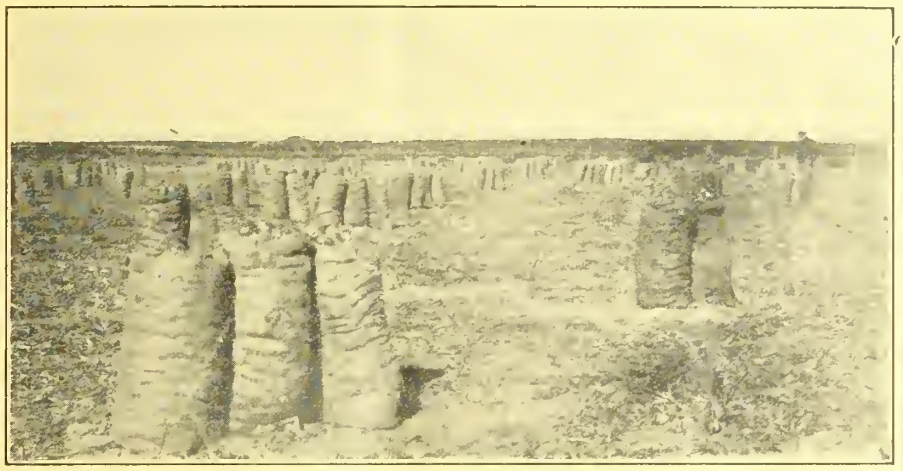
The first years from home test both character and good sense. To the exercise of these qualities nothing contributes more than the influence of home letters from brothers, sisters, and a devoted mother, in sympathy with the absent boy's ambition. An occasional visit home reinforces these influences, and when our city boy now becomes a man of family and sends his children, in turn, to draw their strength from vacations spent on the farm, part at least of a farmer's education soaks into their young and receptive minds.

"If the twentieth century is to be the century of conservation, the beginning of the ordered and permanent life of the Nation," farmers must assume the character of fixed cultivators, and their succession must be from the best fitted son in each generation to the best fitted son in the next.

It, therefore, is up to the farmer to exercise his influence and judgment in insuring such succession.

ONIONS MAKE MONEY FOR GARMANS

Fort Laramie division, North Platte project



Sacks of onions grown by the Garmans

L. C. and R. L. Garman came to the North Platte project from eastern Nebraska in the spring of 1920 and purchased a tract of land containing 80 acres, located in Goshen County, Wyo., of which 68 acres were irrigable from the Fort Laramie Canal. At the time of the purchase they paid a portion down, and since then have paid the balance of the purchase price besides erecting dwellings and purchasing farm machinery and animals, all of which are now paid for out of the proceeds from the crops. They were raised on a farm in eastern Nebraska, but had never farmed under irrigation. The first year that they were on the project they broke out and planted all of the irrigable acreage in the tract, and each year since they have been among the highest producers in that section of the project.

During the year 1925 they planted 5 acres to potatoes, which produced a yield of 250 bushels per acre; 32 acres to sugar beets, which yielded from 18 to 23 tons per acre; and 12 acres of onions, which produced an average yield of 625 bushels per acre. The balance of the tract was in alfalfa and pasture. Each year since coming to the project they have planted a small acreage to onions, and their most noteworthy success has been along that line.

During the first year the yield of onions was very light, but each year since the results have been very satisfactory. Their methods are as follows:

The ground is plowed once in the spring as soon as the frost is out, then thoroughly pulverized with a harrow, beet roller, and a drag until it is as fine as flour, then floated and rolled again to make a firm seed bed. The field is then planted flat. The seed is planted in rows to a depth of about a half inch. The first two rows are 12 inches apart, then a space of 18 inches is left to be plowed out for a ditch, then two more rows planted at 12 inches apart. This method is continued throughout the field, and provides for a double row of onions on the ridge and a furrow for every other row. If the ground becomes crusted from rain, before the onions are up a beet roller is used to break the crust. When the onions are 4 or 5 inches in height, the 18-inch space is furrowed out for a ditch which answers for a cultivation and is usually all that is necessary in the way of cultivation. This depends somewhat on the nature of the soil and weather conditions, as the soil must be maintained in a mellow condition until the onion tops are too high for cultivation. During the summer the field is carefully freed of weeds, but the onions are never thinned because the Garman Brothers learned that if the onions are so thick in the row that they touch one another or even crowd one another out of the ground they are less liable to produce scullions (a scullion is an onion with a long thick neck which has no marketable value).

The furrow system of irrigation is practiced, and about four irrigations per year are sufficient to produce a crop. Very little water is applied at each irrigation, the intention being to simply moisten but never soak the soil, as soaking may result in a crop of scullions. When the onions have matured, which is about the last day of August or the first of September, they are then pulled out of the ground by hand and laid on the rows in the field to permit the tops to dry. After drying, the tops are pulled off by hand and the onions are sacked in the field and ready to be hauled to market.

The Garman Brothers state that one of the principal factors in the successful production of a crop of onions is the condition of the seed bed. Unless the ground is thoroughly pulverized so that each seed may have a firm bed and covering of soil, the seeds germinate at widely different times causing a thin stand of onions which result in a crop of scullions.

The per acre cost of producing a crop of onions is about equal to that of sugar beets. The Garman Brothers specialize in a Yellow Mountain Danver onion and plant 4 to 5 pounds of seed per acre. The seed which they have found to be the best adapted to this part of the country costs about $2 a pound and was developed by a grower located at Delta, Colo. The planting is done by hand with a No. 3 Planet Junior seeder. The other work, such as weeding, pulling, and topping, is also done by hand.

The first four years the ground was not manured, but during 1925 it was given a light coating of fertilizer, and they have learned that manure causes the crop to mature and ripen sooner. During the spring of 1925 the plants were damaged by a frost on April 28, but in spite of that fact the average yield of onions was 625 bushels per acre, worth about $1.55 per bushel on the Kansas City market.

The results obtained by the Garman Brothers show that they have devoted considerable time and thought to the study of conditions incident to the production of a successful yield, such as condition of soil, seed bed, weather, and moisture, and they are of the opinion that a small acreage well farmed is more profitable than a larger acreage where less attention would be given to the detail of caring for the crop.

The accompanying illustration shows the sacks of onions in the field before being hauled to market.

FARMERS GENERALLY USE MARKETING AIDS

There is every indication that farmers generally are using better business methods in handling and marketing their products. This is shown in the manner in which farmers have rebuilt their business from the depression of five years ago. It is shown also by the steadily increasing call for information on standardization and inspection of farm products, farm management, credit facilities, and both domestic and foreign market news.

AGRICULTURAL CONDITIONS ON THE PROJECTS

THE following is a summary of agricultural conditions on the irrigation projects of the Bureau of Reclamation, Department of the Interior, containing a review of the year's results and examples of large individual or project returns:

YUMA PROJECT, ARIZONA-CALIFORNIA

Climatic conditions have been very good for the proper maturing of all crops. Picking of cotton continued heavy, with several thousand bales still in the fields, which indicates a larger crop than last year. Cotton ginned to end of month totaled 20,000 bales. A comparatively large acreage will yield over a bale to the acre, and a few places will yield nearly two bales per acre. The alfalfa industry is very profitable on this project. The seed yield averaged about 300 pounds per acre, from which the returns were from $40 to $50 per acre. One farm of 94 acres yielded 2 tons of hay, nearly 2 tons of straw, and 457 pounds of seed per acre. The gross returns from this crop amounted to about $112 per acre. Lettuce has been a very profitable winter crop. The acreage was not large, but the average returns were above the average for the project.

Watermelons were grown on a comparatively small acreage and were marketed during May and June with very satisfactory returns. Cantaloupes were grown on about 800 acres this year. The yield was large, but so far as known only a very few realized a profit. Most of the growers marketed on a commission basis, and the returns did not pay marketing expenses. One farmer, who sold his crop outright from 35 acres, received $7,000, and so far as known he is the only one who realized a profit. This crop was marketed during the peak of the marketing season of Imperial Valley, which was during a cool season of last June, when the demand was very poor. Up to November 1 more than 2,550 cars of produce had been shipped from the project, the gross returns from which amounted to $2,710,700. The total gross crop returns for the project will be between four and a half and five million dollars.

ORLAND PROJECT, CALIFORNIA

As was to be anticipated, the seasonal yield of alfalfa production was less than the average, being 3.6 tons per acre for 1925, as compared with the average of 4 tons per acre since and including 1911. The price of hay was quite satisfactory, maintaining an average of $12.50 per ton for the season's production, so that the crop value of $45 per acre for the year practically equals the mean production of $45.20 per acre since and including the first year of the project's operation in 1911. A less than normal yield of almonds was partially compensated for by exceptionally high prices for nuts. The yield of 195,780 pounds during 1925 on 1,153 acres of bearing trees is about 40 per cent of the production that might reasonably have been expected had the project trees not been subjected to the retarded growth and damage inflicted by the water supply shortage of 1924. The average yield of 170 pounds per acre for 1925 is the lowest in the history of almond production on the project and is attributable primarily to the water-supply shortage of the preceding year, combined also with the unfavorable weather conditions during the pollenization period in February. Advance reports of the orange production for 1924 are very optimistic. The seasonal production, which is being packed and marketed through the Orland Orange Growers Association, a local organization composed mostly of project growers, will amount to a total of approximately 9,000 boxes, representing a gross return of $27,000, or $99 per acre for the bearing acreage of 274. This return is somewhat greater—about 13 per cent—than the average annual return per acre to date since and including 1912. The local association plans to market this year's crop on the Pacific coast, thereby avoiding the high freight rates incurred in connection with consigning the product to eastern markets. The early shipments which were forwarded during the first week in November commanded the attractive price of $5 per box f. o. b. cars at Orland.

Prunes, of which there were 354 acres of bearing orchards on the project during the year—the largest in the project's history—resulted in a seasonal production of 518,000 pounds and were sold at 7 cents per pound, which is about the usual price received for this project product. The seasonal production value of $102.40 per acre for 1925 exceeds the average to date by about 12 per cent. As a result of damage sustained to stands during the 1924 drought, a considerable acreage of alfalfa was plowed up during the spring of 1925 and planted to milo, resulting in the relatively large area of 1,748 acres being devoted to this crop during the current season. The yield was exceptionally high in quantity, being 53 bushels per acre, which exceeds the average yield to date by nearly 50 per cent. Prices prevailing during November, after a not inconsiderable portion of the season's crop had made an appearance on the market, indicated that an average price of 85 cents per bushel may be confidently predicted for this year's crop.

Some 64 acres of project land were planted to cotton during 1925, mainly for experimental purposes. The Acala variety was planted upon the recommendation of the United States Department of Agriculture and the yield during the year has apparently proven the wisdom of the recommendation of specializing on this variety for the Sacramento Valley. Early prices received by the local growers were a fraction over 7 cents per pound for the raw product, which is equivalent to about 21 cents for the ginned cotton. Later quotations indicate a slight advance over these prices. It has been necessary to take the local product to Maxwell, 33 miles south of Orland, for ginning. The advance crop report for the project gives the results of cotton growing on the 64 acres to be a total production of 50 bales (500 pounds of ginned cotton per bale), valued at $112.50 per bale, representing a total of $5,625, or $87.70 per acre cropped. The maximum yield was 0.9 bale per acre, the minimum 0.5 bale, and the average 0.75 bale. These data apply to the ginned product. Aside from the probable and considerable interference to the picking of the cotton in the fall of the year as a result of continued fall rains—a not unusual occurrence—the results of the year for the future of the cotton industry have been quite encouraging. The problem of sufficient labor during the season for picking will prove a difficult one in connection with an extensive acreage planted to this crop.

A new industry introduced into the Orland community during the year consisted of the operation by the Orland Kadota fig growers of a cannery for processing figs, mainly the Kadota variety. The cannery handled 71,800 pounds of fruit, which were processed in a variety of forms—viz, in glass jars, candied, and also preserved in tins. A fig syrup was also extracted and marketed. The price received by the growers was 4 cents per pound for the green fruit, resulting in a crop value of $22.80 per acre for 125 acres of bearing trees. This appears to be a small return but, in reality, is a relatively high one in connection with trees, the oldest of which does not exceed three years. Kadota figs are noted for their early bearing. The cannery was a source of employment for considerable local labor, 25 women and 5 men being em-

ployed at the height of the season's operations. The pay roll amounted to something over $2,800. A profitable market for the future production of the fig crop has been established during the year, and a bright future for this industry of the project seems assured. In general the agricultural results for the year on the project have been quite satisfactory and represent a partial recovery from the adverse effects of the unprecedented drought and water-supply shortage of the preceding year.

GRAND VALLEY PROJECT, COLORADO

Harvesting of all crops was practically completed, and the favorable weather permitted the digging of beets, etc., without loss from freezing. The entire crop of beets was out of the ground, but a considerable amount was piled at the various loading stations. The factory reported a heavy tonnage from the entire area and a very successful campaign has been in progress. The marketing of alfalfa hay has been slow, and the prices are not very satisfactory, the bulk of the crop moving at $8 to $11 per ton in the stack.

UNCOMPAHGRE PROJECT, COLORADO

Conditions during November were excellent for the completion of harvesting operations and for fall plowing. Threshing of grain had been practically completed, and virtually all the sugar-beet crop had been harvested. The initial payment of $6 per ton for sugar beets will be made on December 15 by the Holly Sugar Co. for deliveries made during November. The company announced that despite a decreased acreage in sugar beets this year the total yield will be approximately twice as large as it was during the season of 1924. The 1925 season was a good sugar-beet year, and as a result the average yield for 1925 will range somewhere in the neighborhood of 14 tons per acre, as compared with the average of 7.3 tons per acre obtained during the 1924 season. Harvesting of potatoes was completed, and much of this crop went into storage wherever storage was available in anticipation of better prices later on. Prices received by growers remained steady during the entire month, ranging around $3 per hundredweight. The movement of the unsold onion crop amounted to little during the month on account of the low price which prevailed. The demand was unsteady; there were one or two spurts during which the prices offered ranged from $1.75 to $2 per hundredweight. These spurts only lasted a day of two at a time.

The wheat market continued to improve during the month. The prices offered increased from $2.05 and $2.15 per hundredweight for the soft and hard varieties, respectively, at the beginning of the month to $2.25 and $2.55 at the end of the month. The project yield for this crop during the 1925 season was good, and as a result a goodly sum will be realized by project farmers. Good yields were also obtained from the oat crop. The price offered remained steady during the entire month at about $1.35 per hundredweight. The annual State pure seed show was held at Colorado Springs from November 16 to November 20. At this show Uncompahgre project farmers carried off the following prizes: Second on certified Cobblers; first on seed plot Rurals and Idaho Rurals; second on Idaho Rurals; second on Red Winter and Red Spring wheat; third on Red Winter wheat; first on registered Minnesota No. 13 corn; first on not registered Yellow Dent corn; first on two-row barley; first on Rosen rye; third on field peas; third on Hubbard squash; first on Mountain Danvers onion seed. Competition was very keen in all classes at this show, and with this in mind the above showing is very creditable to Uncompahgre project farmers. At the International Livestock Exposition held in Chicago during the early part of December, John and George Howell, project farmers, exhibited in the grain class and were awarded the following prizes in competition with the entire United States and Canada: Fourth prize for sweet-clover seed; sixth and tenth prizes for rye; second and sixth prizes for oats; fourth and sixth prizes for winter wheat; fifth and sixth for white spring wheat.

The year 1925 was a very good year for project farmers, both with respect to yields and prices received generally for all crops. This condition was reflected in the cash repayment collections, which up to December 1 were more than twice as large as the collections for the previous year.

BOISE PROJECT, IDAHO

Practically all crops other than corn had been gathered and the threshing of seed was about completed. Hay was bringing $7 a ton in the stack. At the end of the month a large share of the hay was unsold, but greater demand was expected as the fall pasture is fed out. There was an active inquiry for potatoes, but only a few sales were being reported. Most of the potatoes on hand were being held. One potato grower was holding 1,500,000 pounds of his potatoes for expected higher prices. The following are a few examples of large individual returns: O. W. Bunton, $7,800 from 37 acres of apples and 10 acres of prunes; Walsh and Warntjes, $9,500 from 37 acres of apples; Roger W. Batt, 4,450 bushels of potatoes from 13 acres, and 900 bushels of barley from 15 acres; J. W. Briggs, 3,000 bushels of onions from 6 acres; W. E. Thompson, 600 bushels of wheat from 12 acres.

KING HILL PROJECT, IDAHO

All crops were moving except hay and corn. The corn, however, not sold will be fed on the farms. Hay was quoted at $5 to $6 with no buyers. The weather has been open and no stock was in sight to consume the surplus hay.

MINIDOKA PROJECT, IDAHO

The 1925 crops are all harvested, the last of the sugar beets being dug during November. Prices on farm products have become pretty well established, and it is therefore possible to make an approximate estimate of the results of the year's farming operations. This is particularly true of the South Side pumping division, upon which the crop and livestock census has been completed. The summaries will show a cropped area in the pumping division of about 42,000 acres, a total crop value of close to $2,400,000 and an average crop value of approximately $57 per acre. These figures indicate an increase of about 1,200 acres in the cropped area and practically 100 per cent increase in productive value over last year's record, and the total agricultural returns are the best of any in the history of the South Side tract except those for 1919. It is believed that at least a $3,000,000 crop has been obtained on the Gravity division of the project this year.

An analysis of the crop reports for the South Side shows some interesting trends in farming practice, the most outstanding of which was the large increase in the area devoted to grain growing largely at the expense of the acreage in sugar beets. The area in wheat alone increased 3,700 acres, and the area planted to sugar beets decreased 3,240 acres. This transition may be accounted for both by the attractive price prospect for wheat in the spring and by the comparative failure of the beet crop last year on account of insect damage. The alfalfa area increased about 350 acres in 1925, but a much heavier increase is expected for 1926, as many wheat fields were seeded. Grains other than wheat increased 540 acres.

The biggest money-producing crop in 1925 was potatoes. The area in this crop on the pumping division was 3,782 acres, as compared with 3,430 acres in 1924; the average yield, as shown by

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reports given by the growers, was 230 bushels per acre, and the average unit price was $1.35 per bushel. It is therefore seen that the average gross return per acre was about $310. Guy Olin, living 4 miles south of Burley, raised 10,000 bushels of potatoes on 25 acres. On his 80-acre farm he raised crops to the value of $15,470, an average value on the 77 acres of net area cropped of $201 per acre. W. R. Gierisch, living just across the road from Mr. Olin, had but 10 acres in potatoes, but he raised crops to the value of $6,000 on 40 acres. Numerous other farmers obtained production values of over $100 per acre upon the entire area cropped, while potato values ran as high as $750 per acre in some cases. These figures are based upon average prices already received and now prevailing upon potatoes. A large part of the crop is still in storage and is expected to bring a better price than is now offered. Quotations per hundredweight on the staple crops are as follows: Wheat, $2.25; oats, $1.25; barley, $1; potatoes, Gem, $2.50; Rurals, $2.40. Hay in the stack is selling for $7 per ton and at the alfalfa meal mills for $8 per ton.

HUNTLEY PROJECT, MONTANA

The field work in securing the crop returns was practically completed, and, while the total returns have not as yet been tabulated, the work has progressed sufficiently so that a safe estimate of the gross return may be made. It is thought that, allowing only the minimum or contract price for beets ($6.50 per ton), the gross return will equal that of 1924, amounting to $768,658. F. R. Seely produced crops with a gross value of $1,735 from 31.8 acres, or $54.59 per acre. Fred Balzer produced crops with a gross value of $2,536.65 from 35¼ acres, or $71.96 per acre. George Mechalis produced crops with a gross value of $2,361 from 29½ acres, or $80 per acre. The results obtained by Harmon Althoff, a renter, show that high returns are not necessarily dependent on the sugar-beet crop. On 29 acres devoted to alfalfa, beans, garden, onions, straw, and stubble he produced crops with a gross value of $1,867.20, or $64.38 per acre.

MILK RIVER PROJECT, MONTANA

Threshing of small grains and alfalfa seed was practically completed. Harvesting of sugar beets was continued under difficulties practically throughout the month, owing to frost in the ground. It is estimated, for the project as a whole, that probably more than 30 per cent of the beet acreage will not be dug on account of freezing. Frost also materially cut the yield of potatoes, but the loss is probably made up by the increased unit value over other years, the present price being 3 and 3½ cents per pound. Good yields of alfalfa seed were reported. Shipments amounted to more than 101 carloads of beets, 66 carloads of hay, 172 carloads of wheat, 3 carloads of flax, and 1 car of potatoes.

Hauling sugar beets to the dump, Strawberry Valley project, Utah

SUN RIVER PROJECT, MONTANA

The favorable weather conditions during November made it possible to finish threshing and other farm work that had been suspended since the 19th of September. The sugar beets have been harvested. Practically all the potatoes have been saved. The ground was covered with snow during the coldest weather, which protected potatoes that had been well hilled. The damage to wheat was not as great as anticipated. A good deal of the wheat threshed since the storm will be docked only one grade, and the worst of it will take about fourth grade, which at present prices is worth about $1.25 per bushel. The following shipments were made from the project during the month: Forty-four cars of sugar beets, 21 cars of alfalfa, 7 cars of potatoes, 15 cars of wheat, and 4 cars of cattle.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

The favorable weather during November enabled farmers to reduce the percentage of beets frozen in the ground from about 30 per cent to less than 10 per cent of the total crop. Lifting had been suspended, and it was estimated that 6,000 to 8,000 tons of beets remain in the ground. The yield this year was as good as the average. Alfalfa hay was finding a ready market with those feeding livestock at prices ranging from $7 to $10 per ton, with the average at about $8. Unfortunately very few potatoes were planted, so that the high price of this crop does not materially help this project. Peas and beans yielded fairly well and sold at a good price.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

The crop returns on the project have so far shown very satisfactory results, the indications being that the average crop value per acre will exceed any year since the project was operated with exception of those years when war prices prevailed. The Great Western Sugar Co., which operates four sugar factories in the valley and contracts for over 50,000 acres of sugar beets, the greater portion of which are grown on the North Platte project, has announced a preliminary estimate giving an average yield per acre of 16.4 tons. This exceeds by 3 tons any previous average in this district, and it is believed to be a world's record of sugar-beet production on an area of 50,000 acres. Individual yields in some instances are

running as high as 26 tons, with a great many exceeding 20 tons per acre. This high yield is explained by the crop rotation system developed on the project which has brought about a high fertility of soil, by a very favorable growing season, and by the campaign of the sugar company for better farming methods.

The potato crop has been one of exceedngly gratifying returns. At the time the crop was harvested the price ranged from 85 cents to $1 per bushel. This has increased until at the present time potatoes are being marketed at $2.10 per bushel f. o. b. shipping point. As the yield per acre on this project was better than ordinary, some very excellent returns are being received. A good many fields have harvested 350 bushels per acre and some 400. The alfalfa crop has been as good or better than average, there being no trouble experienced with grasshoppers and very little hail damage during the season. Prices have avcraged about $8 to $8.50 per ton in the stack, and at the present time there is but very little hay unsold on the project except that which is to be fed by the farmer. Grain yields for the season have been very satisfactory and fair prices have been secured. However, there has been practically no grain sold except wheat, which has been shipped out of the valley, the oats and barley being fed locally. The corn crop has been average for this territory with a price which is rather below the average. The quality of corn is not all that could be desired, though it is very good for feeding purposes. Several miscellaneous crops have shown good returns, such as onions, beans, and cucumbers. However, these are in such small acreages that they do not affect the total to any great extent.

NEWLANDS PROJECT, NEVADA

The winter-wheat crop is reported to be in excellent condition. The Middle West alfalfa hay market was announced to be closed to project hay by quarantine regulations on account of the presence of alfalfa weevil. It is hoped that these restrictions may be amended in so far as alfalfa meal is concerned. The inability of project farmers to dispose of their alfalfa hay in outside markets on account of weevil quarantine restrictions, together with the low sale price for hay, have served as a stimulus to the dairy industry.

CARLSBAD PROJECT, NEW MEXICO

A small percentage of the last crop of alfalfa was damaged by frosts. The prevailing price of alfalfa hay was $25 per ton. Cotton picking was eontinued without interruption, and approximately 95 per cent of the crop had been picked at the close of the month. Cotton ginned to date, which includes the crop from a few private irrigation plants adjacent to the project, totaled 11,660 bales as of November 30, 1925. The price of lint cotton ranged from 18 to 20 cents a pound.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

Reports from the different cotton gins over the project show that approximately 62,000 bales of cotton had been ginned to November 28, which indicates a total return from the lands within the project of over $8,500,000 from this commodity, an increase over the season of 1924 of more than $1,500,000. In addition to the return from project lands proper, it is estimated that a return of over $750,000 will be realized from this crop on Warren Act lands below the project, which receive water from Elephant Butte Reservoir. The prices being paid this season for both cotton and cottonseed are somewhat under those of last season, but at the present prices of 22½ to 23 cents there is a substantial margin of profit for the grower where proper attention is given to the culture of the crop. Alfalfa produced a normal yield, with prices ranging from $16 to $25 per ton, according to grade. This crop, in the main, will grade higher than in former years, due to many grass-infested fields being planted to cotton. Dairymen have experienced a very successful year, this industry consuming a very large part of the surplus alfalfa hay crop. All fruit crops produced a good yield, with satisfactory prices throughout the season. A good yield was realized on cantaloupes, but the price was below normal, and it is the general belief that the crop as a whole returned very little net profit to the growers.

UMATILLA PROJECT, OREGON

During the winter of 1924 subzero weather with no snow covering the ground froze out a considerable quantity of alfalfa. The acreage would be hard to estimate, as the result of the freeze showed up during 1925 in many dead patches in the fields, a considerable decrease in yields resulting. The price of alfalfa during the current year has been good, ranging from $10 to $12 per ton in the stack. As 90 per cent of the project is in alfalfa and pasture, its prosperity depends mostly on alfalfa crops and to what use it is put. Those depending entirely on the sale of alfalfa, and they are numerous, are far from prosperous. Butterfat and eggs have produced good prices throughout the year, and dairymen and poultry raisers who understand their business have been receiving good returns for their work. Butterfat during November fluctuated between 54 and 57 cents and eggs between 44 and 50 cents. There was a limited acreage in potatoes, cantaloupes, and melons. One water

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An irrigated potato field on the King Hill project, Idaho. Potatoes were an exceptionally remunerative crop this year

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user sold $800 worth of potatoes from 2 acres, another received $1,260 from 6 acres of cantaloupes, and still another $800 from 5 acres of melons. These instances of good returns were received by men who are fundamentally stockmen, feed most of their hay on the farm, and return the fertilizer to the fields. Asparagus, which was planted in small plots here and there over the project in 1924, showed a good, and in some instances, where well fertilized by barnyard manure, luxuriant growth. This crop will begin to derive returns in 1926, and hopes are entertained that another money-making crop has been added to the project.

KLAMATH PROJECT, OREGON-CALIFORNIA

The alfalfa crop was below the average owing in part to considerable areas being winter-killed. Damage was also done by cutworms. The area in potatoes approximated 2,000 acres, or 500 acres more than last year. An August frost materially reduced the yield of some fields. The average amounted to 80 to 90 sacks of United States No. 1, and about 25 sacks of No. 2, with some small potatoes in addition. Forty-five cars of No. 1 have been shipped, and about the same number of standards. Some potatoes have not yet been dug, and appreciable quantities are being held for higher prices. The price recently has been $2.50 or more at Klamath Falls.

The Tule Lake leased lands produce the principal grain crops of the project. These lands are flooded in the spring and after that do not receive any water other than subirrigation from the flow of Lost River. Some good crops have been obtained during the past season. The average and best crops are reported as follows: Wheat, 5,620 acres, produced 122,600 bushels, an average of 21.8 bushels per acre (the largest yield reported was 50 bushels per acre from 400 acres); oats, 3,150 acres, produced 137,700 bushels, an average of 43.7 bushels per acre (the largest yield reported was 15,000 bushels from 80 acres, or 187.5 bushels per acre); rye, 3,550 acres, produced 67,730 bushels, besides 2,500 tons of hay (the largest yield reported was 6,000 bushels from 120 acres or 50 bushels per acre); barley, 7,100 acres, produced 185,000 bushels, besides 700 tons of hay (the largest yield reported was 32,300 bushels from 442 acres, or 73 bushels per acre). Under the Klamath drainage district, Mr. Motschenbacher reported 46 bushels of rye per acre from 378 acres, Mr. Chin Lung (a Chinaman) reported about 3,044 bushels from 130 acres, and Mr. Lane reported about 12,200 bushels from 450 acres. The crops of Chin Lung and Lane were more or less damaged by sheep.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

All crop returns on the project show up well for the past season. Sugar-beet yields are attracting particular attention. Large fields of 20 to 30 acres produced in the neighborhood of 23 tons per acre and small fields report as high as 30 tons. Harvesting was delayed by bad weather in October, and the beet dump remained in operation until November 30. Five hundred and thirty carloads have been shipped from project towns, or a total of about 21,000 tons. Corn husking is about over, and with prevailing open weather the livestock have had good pasture on the rough feed. Considerable corn has been shredded for winter cattle feed, some has been shelled for market, and perhaps one-third was consumed by sheep and hogs in the fields. There is a good local demand for corn, and none has been shipped to distant markets. Alfalfa hay continues to move slowly at $6 to $7 in the stack, although several sales of 100 to 200 tons have been made to sheep men both on and off the project.

STRAWBERRY VALLEY PROJECT, UTAH

At the close of the month all crops had been harvested with the exception of about 5 to 10 per cent of the sugar beets. The tonnage of sugar beets to be handled by the three project factories is estimated at 105,000 tons, with average sugar content of about 16 per cent. The price of wheat advanced slightly during the month to $1.30 per bushel, while oats and barley remain about stationary. About 3,000 tons of alfalfa hay are being shipped to Texas points, with prices ranging from $11 to $11.50 per ton, baled, f. o. b. the cars. As a result a lot of old-stock hay is being marketed at a fair price. The season of 1925 was one of the best experienced on the Strawberry Valley project in many years. It was due primarily to an excellent and extended growing season with an abundance of early rains which insured germination and good stands, and also to regular intermittent storms each month, which refreshed the crops and broke any long continued spell of hot weather. Though the natural run-off of all streams was below average, yet the excess rainfall during the season made up to some extent this loss. The extremely low temperatures during the winter of 1924–25 killed or injured many peach and early fruit trees, with the result that the peach crop was practically a failure and the cherry crop reduced to about one-third the average.

The yields of all other crops have been average or above average, and the prices received for them sufficient to return reasonable profits. The area under specialized crops, such as peas, string beans, and tomatoes for canning purposes, increased to 1,600 acres, with some individual returns in excess of $200 to $300 per acre. The sugar-beet crop was exceptionally heavy, averaging over the entire area approximately 13.6 tons per acre, with individual yields in some instances as high as 25 tons per acre. The hay and grain crops were also good and are being sold at fair prices. The gross value of all crops produced on the project will be slightly in excess of $2,000,000 from 55,000 acres of irrigable agricultural lands, representing about 41,000 acres cropped wholly or in part under project water rights, yielding about $43.50 per acre, and 14,000 acres of other agricultural lands under other independent water rights, yielding $36.50 per acre. The total returns for the irrigation season of 1925 show an increase over those of the previous season of about $300,000, or $6.50 per acre over the entire project area.

OKANOGAN PROJECT, WASHINGTON

From the data on hand it appears that the apple crop will only be about 50 per cent of what it should be normally. Prices are fairly good, and many of the orchardists will make some money for this season. A few on the project have made a good showing for this season. Where the trees had sufficient water during the past irrigation season the orchardists claim that many fruit spurs have developed and that prospects are good for an excellent crop next year.

YAKIMA PROJECT, WASHINGTON

To the close of November almost 19,000 cars of farm products had been shipped from the Yakima Valley, being composed chiefly of the following: Apples, 7,570 cars; pears, 2,490; potatoes, 3,554; hay, 4,567; onions, 368; mixed vegetables, 261; total, 18,810 cars. The potato market remained firm at $55 to $60 a ton, and satisfactory prices are quoted for all other kinds of farm produce. A greater percentage of the total crop produced, both on the Yakima project and in the Yakima Valley as a whole, has been shipped to market than in previous years.

RIVERTON PROJECT, WYOMING

The only project land under irrigation and cultivation in 1925 was 80 acres located south of Pilot Butte Reservoir, owned by Robert K. Warren. This area of raw land was seeded to oats, and the yield is estimated at 2,400 bushels, or an average of 30 bushels to the acre.

SHOSHONE PROJECT, WYOMING

November was an unusual month in that while there were no storms of any consequence and the temperature was equable, yet the prevailing temperature was 2° below normal, and being on an average below freezing caused the ground to become frozen seriously on the 6th and remain so thereafter. As a result, while it was possible to proceed with threshing and even stacking hay that had been in the windrow or shock for six weeks, the sugar-beet harvest was stopped except in a few favored localities, and there remain in the ground about 80 acres of such crop on the Frannie division and 210 acres on the Garland division, respectively, about 20 and 10 per cent of these crops. The October storms did less damage than was anticipated to the third cutting of hay on the Garland division, but on the Frannie division more of the storms fell as rain instead of snow, with the result that much third-cutting hay was badly damaged.

There are no reports of loss of potatoes by being frozen in the ground, and damage to unharvested peas and beans except in a few cases where carelessness prevailed was not serious. No damage to grain crops by storm is reported except in a few isolated cases where late crops were not cut before the storms began. In general crop yields are good, exceeding those of last year, and in the case of sugar beets the increased yield will probably result in as many tons per acre being harvested for all acres planted as was harvested last year in spite of the frozen-in losses.

On the Garland division an estimate of the cash crops of 1925 as compared with 1924 shows an increase of about $100,000. Of this increase it is estimated that $45,000 has been cashed, while the remainder represents anticipated profits from potatoes in storage and unsold hay. As respects this division, 1925 is expected to be the best year since 1919. The only sore spot is the sugar-beet situation. Besides losses on account of beets frozen in the ground, the growers of this crop were put to unusual expense in getting out what they did save by reason of muddy fields and roads and disagreeable weather, and are also faced with a low price for sugar, with the consequent probability that there will be very little bonus to add to the guaranteed price of $6.50 per ton.

For a time the hay situation also looked very dark, as the State of Missouri, in which is located Kansas City, the project's principal hay market, placed an embargo on all hay shipped from Wyoming on account of the presence of the alfalfa weevil in the State. By energetic action of a hay growers' committee and the State agricultural commissioner it was possible to convince the Missouri authorities that there was no weevil in the Big Horn Basin, and the embargo was lifted with respect to it. The Chicago, Burlington & Quincy Railroad also granted an emergency hay rate to Kansas City and certain other points, which cuts the standard rates from 80 cents to $1.50 per ton. The Peters Milling Co. began operating their alfalfa mill at Powell on the 13th. They are paying $10 per ton for bright hay, having contracted 1,000 tons at this price earlier in the season. Two portable alfalfa mills also were in operation during the month. They pay $9 per ton for the best hay. A third mill is being assembled and will also soon be in operation. The common price for hay bought to be fed on the farm is $8 loose, which is also about the price for baled hay after allowing for baling.

On the Frannie division conditions are similar to those on the Garland division, except that a large area in Polecat Valley has no first cutting of hay because of the May and June hailstorms and that there is only a very small acreage of beans and no peas, both of which were remunerative crops on the Garland division. In spite of the various adversities it is believed that the 1925 crop production will exceed that of 1924. The following carload shipments of produce were made during the month: Alfalfa hay, 54 cars; alfalfa meal, 35; potatoes, 24; beans, 8; beets, 258; oats, 1; wheat, 4; honey, 1.

WASHINGTON STATE AID PROJECT

A RECENT issue of the Engineering News-Record contains an interesting statement concerning the White Bluffs-Hanford land settlement project, a Washington State-aid colony on the Columbia River about 50 miles north of Pasco and 20 miles east of Priest Rapids, Wash., from which the following is extracted:

The colony was selected expressly for irrigation, is favorably located with respect to markets, has an average growing season of 204 days, and matures crops earlier than any other locality in the State.

The raw land was purchased by the State at an average price of $18.50 per acre. Before the settler goes on the land the State selects the location for a well or wells, sinks them, and equips them with motor-driven pumps of sufficient capacity to supply the needs of the area included in the farm. Of the 100 tracts on the project, 62 have been colonized and developed in whole or in part.

Settlers are required to have had some experience in farming and to have at least $1,500 or its equivalent in credit.

The State also constructs on each tract a three-room plastered cottage with ample porches and concrete cellar, a 16 by 30 foot combination barn and cow shed, and a small modern poultry house.

Where the settler desires it, additional financial aid for clearing, leveling, seeding, fencing, fluming, etc., can be arranged for, and where necessary the State will pay the power bill for the first three years.

The total investment by the State in land, buildings, improvements, and power bills (in cases where the settler elects to accept all financial aid available) amounts to approximately $5,000 per 20-acre tract. Toward this amount the settler is required to make an initial payment of $612.50. During the first three years of operation it is assumed that this is a development period, and for this reason the State requires only payment of pumping charges and interest upon the investment made by the State. The settler's annual payments thus approximate $18.40 per acre allocated as follows:

Interest on balance due State (4 per cent of $4,387.50)	$175. 50
Power for pumping, $35 for 5.5 horsepower (minimum)	192. 50
Total	368. 00

Beginning the fourth year it is expected that the settler will have derived some return from the development of his tract, and whatever is his balance at this time is amortized into 20 equal annual payments, amounting to $7.36 per year on each $100 of indebtedness, which constitutes an amount which will discharge interest and principal in 20 years. The average annual charge per acre is approximately $25.73 and on a 20-acre allotment is made up as follows:

Amortization of unpaid balance and interest due State	$322. 00
Power for pumping	192. 50
Total	514. 50

The settlers now on the project are devoting about one-half of their acreage to feed for dairy cows, hogs, and chickens, and the remainder to early fruit and vegetables.

ORGANIZATION ACTIVITIES AND PROJECT VISITORS

R. F. WALTER, chief engineer, and George C. Kreutzer, director of reclamation economics, have spent a number of days in the Washington office in connection with the hearings on the appropriation bill and the conference on reclamation and land settlement.

Russell R. Hornberger, assistant engineer in the Denver office, was transferred to the Yuma project on November 2.

W. C. Christopher, assistant engineer in the Denver office, was transferred to the American Falls Dam, Minidoka project, on November 8.

Charles R. Menefee, storekeeper, was transferred from the Riverton to the Yuma project, reporting for duty on November 12, to fill the vacancy caused by the resignation of Harry J. Keiling.

Oliver P. Morton, employed by the Orland Unit Water Users' Association, spent several days recently on the project in connection with the Stony Creek water right adjudication suit.

Sr. Ignacio L. Figueroa visited the Grand Valley project recently and inspected the principal structures on the irrigation system. He was particularly interested in the methods of water delivery and the operation and maintenance organization with a view to the adoption of some of the methods in the reclamation work to be undertaken in Mexico.

Superintendent Page and Engineer Blackmer of the Grand Valley project visited the Uncompahgre project on November 21 to inspect the ditch-cleaning work of the Ruth dredger.

O. W. Israelson, professor of irrigation and drainage at the Utah Agricultural College, with a number of students, inspected the work at American Falls Dam recently. Professor Israelson tries to make such a trip with a portion of his classes nearly every year, visiting irrigation projects that are accessible and thus giving his students first-hand information as to the methods of construction and operation and maintenance.

Superintendent of Construction S. O. Harper visited the Huntley project in November, looking over the main features of the canal and lateral system. He also visited the Milk River, Sun River, Lower Yellowstone, and Belle Fourche projects.

ORLAND WATER USERS MAKE LARGE PAYMENT

On December 1, 1925, the Orland Unit Water Users' Association turned over to the local fiscal agent the sum of $48,399.22 as a partial repayment on the 1925 construction charge, the total of which amounts to $66,552.92. This leaves only a 27 per cent delinquency in the payment of the 1925 charge.

Collections through the project office during November were similarly gratifying, $5,960.80 having been collected, itemized as follows: 1924 construction installment, $4,010.88; 1924 operation and maintenance charge, $521.71; 1925 excess water charge, $460.52; interest and miscellaneous, $967.69.

Commissioner Mead has written to Superintendent Weber as follows:

"Your reports of the collections of water-right charges, both current and past, are most gratifying. I have no doubt that the Orland project, through the combined efforts of yourself and the directors of the Orland Unit Water Users' Association, will soon regain its past record of a '100 per cent' project."

Engineer Walter L. Drager has completed his assignment on the St. Mary storage, Milk River project, investigating reservoir possibilities, and has returned to the Denver office.

District Counsel R. J. Coffey was on the Newlands project in November to attend to Truckee and Carson River water-right adjudication suit.

Mrs. Ethel Mary Cavanaugh, junior clerk, Carlsbad project, has resigned.

The clerical force on the Rio Grande project was reduced recently by the resignation of R. A. Parsons, storekeeper, whose duties have been combined with the work of other employees.

Andrew Weiss, assistant director of reclamation economics, has been making Hermiston, Umatilla project, his headquarters, in connection with his review of the report on the Umatilla Rapids project.

T. R. Smith, junior engineer, has been transferred from the Klamath project to the American Falls Dam.

Julian Hinds, engineer and chief draftsman of the Denver office, has been on the Klamath project recently, making detailed examinations and adjustments of the installations at Gerber Dam for the investigation of strain in the dam. These investigations are being carried on under the direction of the special committee on arch dams of Engineering Foundation, on which Mr. Hinds is the representative of the Bureau of Reclamation.

Superintendent Lytel, Yakima project, made a trip recently to Olympia to furnish information to the board of directors of the Kittitas district in connection with proposed legislation affecting the division. A number of conferences were held with the secretary of the district on progress of the work, furnishing information on various features and plans of procedure.

E. E. Roddis, district counsel, visited the Shoshone project recently to attend the hearing in regard to the formation of the Shoshone irrigation district.

Ralph C. McCreary, index clerk in the mails and files section of the Washington office, resigned recently and is succeeded by Malcolm J. Annadale.

The Secretary of the Interior has named Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, to represent the Interior Department respecting the disposition and apportionment of the water of the Columbia River and its tributaries under the provisions of Public Act 609, Sixty-eighth Congress.

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1926

New Year's Statement of Elwood Mead

Commissioner of Bureau of Reclamation

THE administration of the Reclamation Bureau this year was made difficult by abnormal and perplexing conditions. Hearings of the Board of Survey and Adjustments on various projects had an unsettling effect on the minds of water users. This caused postponement of payments which was further influenced by possibility of deferments under Subsections F and L of the law of December 5, 1924. The provision for covering delinquent operation and maintenance into construction has also done much to postpone payment by many able to meet assessments in full.

The act changing the basis of payment from a percentage of the cost of the project to a certain percentage of the average annual gross value of crops has led to many diverse views as to how it should operate, and has tended to unsettle the minds of water users and render more difficult the task of administration.

These difficulties will be less prominent next year. The report of the Board of Survey and Adjustments has been completed and is ready for transmission to Congress when it reassembles in January. Two bills have been introduced in Congress for simplifying the act providing for a change in the plan of payment. It seems probable that a majority of the old projects will elect to continue under operation by the bureau, rather than to assume entire financial responsibility for raising the money needed to meet operating expenses and pay construction charges. This will restrict the adoption of the new payment plan on existing projects.

Action by Congress on the recommendations of the Board of Survey and Adjustments will end long-standing controversies and eliminate financial difficulties on a number of projects. It is expected that special legislation will be enacted by Congress to improve agricultural conditions, extend the irrigated area, and increase payments to the Government on other projects in such a way as to make them self-sustaining enterprises in the future.

The fact that seven projects are financially in a blue-ribbon class, either paying all of the charges due or so closely approaching complete payment as to make this possible, has had a reassuring influence on public opinion throughout the country. If an equal number of other projects can meet all payments during the year to come, it will do more than all other influences combined to restore popular support for the reclamation policy.

In part due to uncertainty and in part to causes not wholly understood, collections have not been pressed on some projects by local officers. Action has been delayed until pressure was exerted from Washington. This is not as it should be. It is the duty of the district counsel and the project superintendent to keep a close oversight on all of the actions of districts or associations affecting assessments and collections of money due the Government, and a failure to do this will hereafter be regarded as a neglect of duty.

This matter is referred to because the delinquencies of last year reached the staggering total of $3,000,000. We wish in the year to come to see a restoration of payments as they were made prior to about 1920. Every opportunity should be utilized by the local officers to impress the necessity for this on water users and the organizations that have to do with assessments and collections.

The signing of a contract by the State of Washington and the department in December, 1925, for providing financial aid and practical direction in the settlement of the Kittitas project marks a new era in the settlement and agricultural development of project lands. There is still a difference of view among Members of Congress as to whether this aid should be furnished by the State or by the Federal Government, but the need for aid and direction is now so generally recognized as to lead to the confident belief that in the development of all new areas it will hereafter have to be furnished from some source.

The provisions in appropriations for State cooperation and assistance on four new projects, the classification of lands and determination of fit and unfit areas, the requirement that privately owned land, held in excess of homestead units, should have the price at which it is to be sold fixed before construction begins, have involved many negotiations with landowners and extensive agricultural and economic investigations not hitherto provided for. This has delayed beginning of construction on new projects.

The report of the Board of Survey and Adjustments shows conclusively the necessity for having these matters thoroughly investigated and definitely settled before construction begins. Where they were neglected and left to be settled after the works were built, the results have been unsatisfactory.

Among our duties in the new year aid in improving agricultural practice and building up morale may claim first place. These are needed to secure prompt payment of project assessments, either for construction or operation and maintenance. Future accumulation of arrears must, if possible, be prevented.

Action by Congress on the report of the Board of Survey and Adjustments and on legislation for aid in settlement will impose special duties and require consideration of new questions. We have now left the era of adjustment and enter on the era of fulfillment and constructive effort. These will be a source of interest and satisfaction to all who have to deal with administrative matters.

SOME TWO YEARS AGO it was said that the Secretary of the Interior had become a "receiver for Federal reclamation." Time has demonstrated the accuracy of that belief.

The Reclamation Bureau had been organized as a company to construct. As a railroad is built, structures were fabricated, levels were run, grades were established; then the construction engineers became operators, and continued themselves as the settlement agency and as agricultural economists.

Training as engineers to construct, does not contemplate studies of soil, animal husbandry, rotation of crops, marketing, or social relations.

The new era in reclamation is concerned in these things. The engineering branch of the bureau has been retained as a distinct service; but the principal officers of the bureau are now economists, stressing agriculture, primarily. Studying the broad question of what is best for the settler, and his wife who in the last analysis is the directing influence in successful farm life which is the fundamental concern of the Reclamation Bureau as now organized.

Eight of the projects under the Department of the Interior may now be returned to the management of the stockholders' representatives, with every assurance that they are successful, independent, going concerns that will liquidate their indebtedness as it falls due.

Eight give reasonable assurance of better conditions; while eight need special treatment by Congress. If this is provided their condition will be greatly improved and payments to the Government increased.

States and communities are coming to realize that they have moral and financial obligations to those invited to live among them, and have begun in the State of Washington to assume them. It can now be safely said that the new era in Federal reclamation is begun, and that a "receiver" is no longer necessary for all Federal reclamation projects.

Hubert Work

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NEW RECLAMATION ERA

VOL. 17 FEBRUARY, 1926 NO. 2

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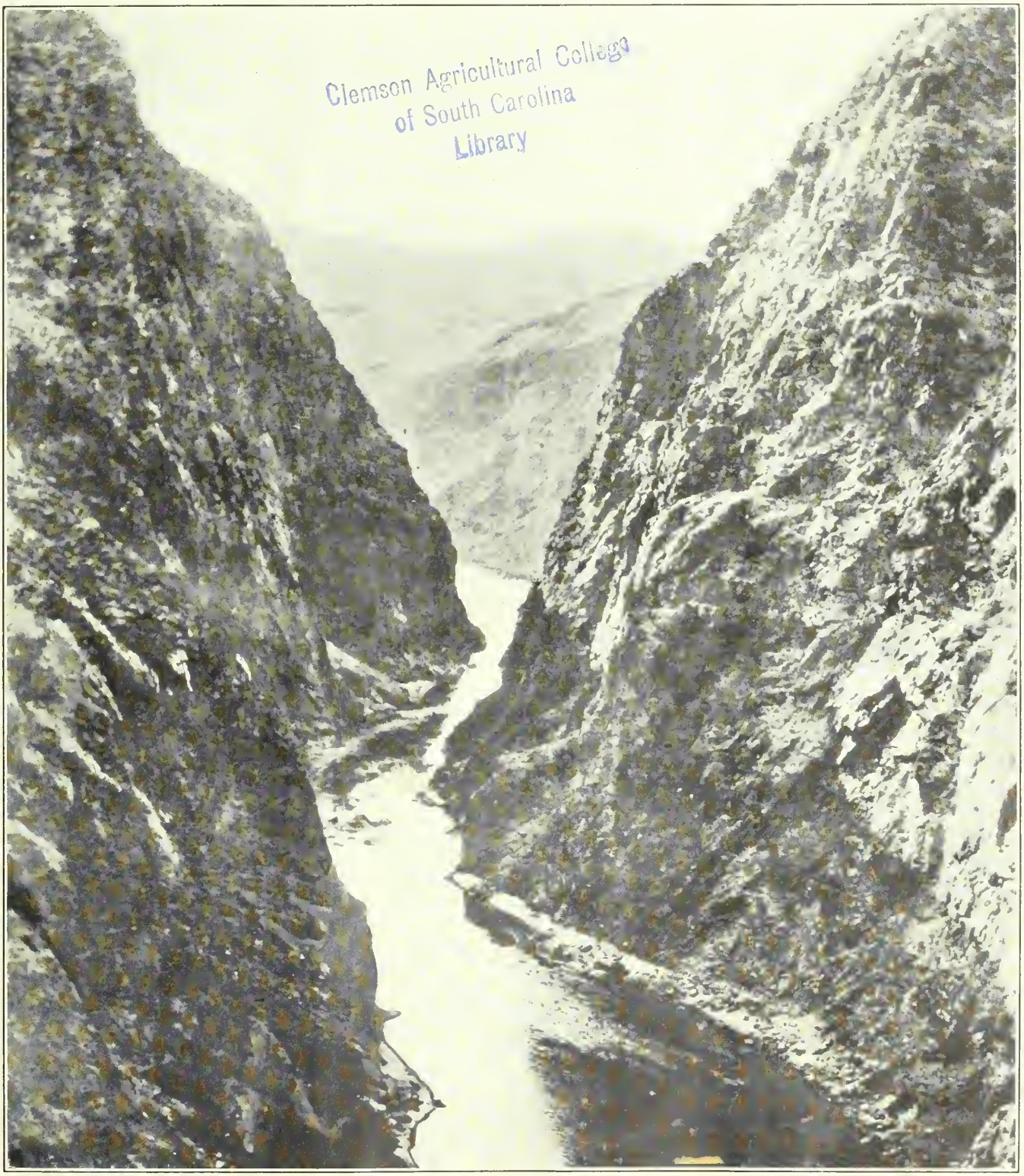

BOULDER CANYON RESERVOIR DAMSITE ON COLORADO RIVER
(See article, page 20)

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BETTER farming simply means the application of modern science to the practice of agriculture. Better business is the no less necessary application of modern commercial methods to the business side of the farming industry. Better living is the building up, in rural communities, of a domestic and social life which will withstand the growing attractions of the modern city.

Sir HORACE PLUNKETT
In "The Rural Life Problem of the United States."

NEW RECLAMATION ERA

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Price, to others than project water users, 75 cents a year

HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 17 FEBRUARY, 1926 No. 2

HIGH LIGHTS IN A REVIEW OF THE MONTH

SUPERINTENDENT LAWSON, of the Rio Grande project, broadcasts the 1925 crop results in the following telegram: "Crop report Rio Grande just completed shows total gross value yield both districts Hudspeth County and Mexico $12,605,000. Elephant Butte and El Paso districts produced $10,680,000. Increase over last year of approximate million in spite of half million loss due to flood."

THE gross crop returns in 1925 from the Grand Valley project amounted to $693,000, or $52.89 an acre, as compared with $46.60 an acre in 1924. In addition, the irrigation districts which obtain water from the project system had returns estimated at $1,150,000. The net income over the entire valley is probably higher than in any year since the war.

THE crop report on the Boise project showed a return of $35.14 per acre. The average return was lowered by the prices received for alfalfa, barley, and oats, which comprised about half the acreage planted in 1925 on the project. The higher returns were received from potatoes, amounting to $172 per acre, and onions, $363 per acre.

A FIELD of timothy and red clover, seeded on the Uncompahgre project 32 years ago, which has produced abundant crops each year and from which more than $45,000 worth of hay has been produced, is one of the outstanding evidences of fertile soil and productivity in the Uncompahgre Valley.

THE total gross value of crops grown in 1925 on 4,414 acres on the Okanogan project amounted to $945,406, or $214.18 per acre, principally from the apple crop. From 4,038 acres in this crop, the total yield amounted to 796,600 boxes, valued at $1.13 per box, giving a total value of $900,158, or about $223 per acre.

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THE Yakima Valley reports the most prosperous agricultural year in its history. Crop returns for 1925 totaled more than $47,000,000 from 350,000 acres.

CROP values for 1925 on the Belle Fourche project totaled $891,000, an increase of $294,000, or 49 per cent, over the previous year. Sugar beets made an extraordinary record, producing an average yield of 16.1 tons per acre, or twice that of the previous year. A number of farms produced above the 20-ton mark, and several small fields reported up to 30 tons per acre. Project beet growers realized $120,000 in cash, or $97 per acre from the beets, and it is estimated that bonuses and beet tops will bring the total return to $133 per acre.

WELL cared for pickle patches on the Belle Fourche project yielded 250 bushels of cucumbers and over per acre. The L. J. Townsend farm near Nisland reported $553.20 in cash received from 1 acre, and other farms reported returns in the neighborhood of $400 per acre.

ON December 31, 1925, operation and maintenance of the King Hill project was turned over to the King Hill irrigation district.

POTATOES held in storage for expected advances in price, representing about 20 per cent of the crop on the Uncompahgre project, are valued at $350,000 to $400,000. The gross value of all crops on the project for 1925 amounted to $3,032,000, or an average of $49.47 per acre cropped.

THE Laabs cheese factories on the Minidoka project have added a new product to their output. The manufacture of Swiss cheese has been inaugurated at the Burley, Rupert, Paul, and Declo factories, made up in 60-pound and 200-pound drums.

LAST year 950,000 pounds of butterfat were produced on and marketed from the Newlands project, in addition to the production from approximately 1,000 cows which was consumed by farm families and town retail trade. The average price paid at the local creamery was 52.3 cents, or 9.1 cents higher than in 1924.

TOTAL collections on construction and operation and maintenance charges on the Newlands project amounted to $209,104 in 1925 as compared with $152,158 in 1924, or an increase of nearly $57,000. A more optimistic spirit is evident among project farmers than for several years past.

THE total 1925 crop value on the Gravity division, Minidoka project, was $2,539,667, compared with $1,446,284 in 1924. On the South Side Pumping division the total was $2,382,423, compared with $1,185,910 in 1924.

THE Sun River project crop report for 1925 shows an average value per acre of $21.82 for the Fort Shaw division and $19 for the Greenfields, or an increase of 50 per cent over the average value of the past four years and the best showing since 1919.

UNDER a recent decision of the Comptroller General of the United States, the deduction of a fee from the pay of employees, for the purpose of maintaining a fund for furnishing medical and hospital service not covered by the employees compensation act, has been discontinued, beginning January 1, 1926, and the bureau will not be liable for any such obligations incurred by its employees.

APPROXIMATELY 600 new automobiles were purchased by water users on the Minidoka project last year, in addition to a large number of used cars.

PRELIMINARY CROP REPORT, FEDERAL IRRIGATION PROJECTS—1925 (EXCLUDING WARREN ACT LANDS)

Project	Acreage cropped		Value of crops		Value of crops per acre cropped	
	1925	1924	1925	1924	1925	1924
Salt River	217,900	215,430	$22,456,642	$22,091,850	$103.05	$102.55
Yuma	55,801	53,120	4,718,485	4,504,090	84.56	84.80
Orland	11,330	9,970	504,580	224,950	44.55	22.57
Grand Valley	13,110	12,600	693,320	587,430	52.89	46.60
Uncompahgre	61,294	62,100	3,032,395	1,941,600	49.47	31.26
Boise	93,695	[1] 111,050	3,323,775	2,708,740	35.47	24.40
King Hill	5,960	6,070	183,320	224,630	30.76	37.04
Minidoka	95,755	91,060	4,922,092	2,633,190	51.40	28.91
Gravity division	53,840	50,340	2,539,667	1,446,280	47.17	28.73
South side pumping division	41,915	40,720	2,382,425	1,186,910	56.84	29.15
Huntley	19,310	19,770	744,875	827,520	38.57	41.86
Milk River	18,495	14,530	277,395	177,360	15.00	12.21
Sun River	26,400	30,590	534,810	401,690	20.25	13.13
Fort Shaw	7,730	8,140	168,670	111,460	21.28	13.69
Greenfields and Big C division	19,270	22,450	366,140	290,230	19.00	12.93
Lower Yellowstone	18,275	14,030	642,160	548,400	35.14	39.10
North Platte	160,965	129,140	5,137,716	3,511,650	31.91	27.19
Interstate	84,120	80,910	3,169,210	2,343,110	37.68	28.96
Fort Laramie	67,420	39,060	1,764,935	991,720	26.18	25.38
Northport	9,425	9,170	203,571	176,820	21.60	19.28
Newlands	37,170	40,760	1,034,975	1,405,120	27.85	34.47
Carlsbad	22,861	23,070	1,433,059	2,239,900	62.69	97.10
Rio Grande	121,800	103,120	10,676,615	9,624,570	87.65	93.34
Umatilla	12,850	12,510	363,811	334,860	28.32	26.76
Klamath	33,367	32,710	671,670	792,570	20.13	24.23
Main division	31,850	31,520	633,265	762,890	19.90	24.20
Tule Lake division	1,517	1,190	38,405	29,680	25.31	25.00
Belle Fourche	53,120	49,810	891,250	597,090	16.78	11.98
Strawberry Valley	41,300	41,040	1,789,33	1,519,160	43.32	37.01
Okanogan	4,415	3,950	945,405	699,600	214.13	177.11
Yakima	101,574	102,680	12,004,067	8,118,640	118.18	79.06
Sunnyside	78,474	78,130	8,978,767	4,923,820	114.42	63.02
Tieton	23,100	24,550	3,025,300	3,194,820	130.97	130.16
Shoshone	36,325	36,320	930,450	713,500	25.61	19.64
Garland	29,625	29,600	810,855	617,230	27.46	20.86
Frannie	6,700	6,720	119,595	96,270	17.85	14.41
Total	1,263,672	1,215,430	77,912,197	66,128,110	61.65	54.41
Increase over 1924	48,242		11,784,087			
Per cent of increase	3.96		17.8		13.3	

[1] Includes a portion of Warren Act lands.

MODEL IRRIGATED FARM

Lower Yellowstone Project, Mont.–N. Dak.

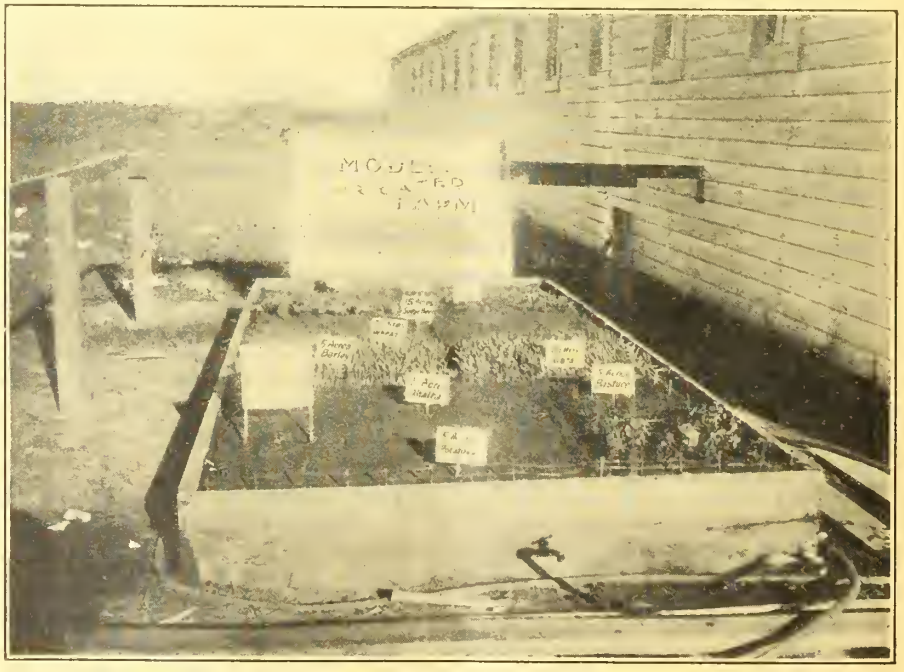
AN opportunity was presented at the Richland County fair, held last fall at Sidney, Mont., to advertise the work of the Bureau of Reclamation and at the same time to assist the water users of the project in better farming methods through the medium of a miniature irrigated farm. Two principal objects were kept in mind in the preparation of this exhibit. The first was to show a crop rotation that would make a completely diversified agricultural program and the second to show various methods and systems of irrigation adapted to the crops grown and the topography of the land. Judging from the interest shown in the exhibit it was well worth while.

The model farm was prepared 6 feet by 12 feet in size, representing an 80-acre unit. The various fields were laid off to scale and seed was planted in advance of the fair so that all crops were actually growing. A small placard was placed in each field giving the number of acres and information as to what was planted there last year and what would be planted next year.

The surface was purposely left with uneven topography in order to illustrate different systems for irrigation. The field lateral, border, and contour systems were shown. Miniature canal structures were placed in the ditches and their use explained. Water was supplied to the head ditch from a hose and the fields were irrigated several times a day. A graveled highway, fences, farm buildings, lawn, shade trees, etc., were details added to assist in the impression of a complete farm home.

The crop-rotation scheme was based on 15 acres of sugar beets and 20 acres of alfalfa each year. By plowing up 7½ acres of alfalfa each year and seeding a like amount, beets would be grown two years in succession and alfalfa approximately three. Four acres were reserved for buildings, kitchen garden, shrubs, etc., and five acres for pasture.

The first year after plowing up the alfalfa, corn would be planted in order to have a crop susceptible of vigorous cultivation to kill the alfalfa. Following corn would come beans, a profitable crop and one in which corn stubble is not so objectionable as in beets. Next would come sugar beets for two years followed by one year of wheat. After the wheat, oats or barley would be planted and used as a nurse crop for new alfalfa. If desired to shorten the rotation period, the beans and wheat can be omitted.



Model irrigated farm on the Lower Yellowstone project, Montana-North Dakota

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THE Mapleton irrigation district, Strawberry Valley project, has transmitted a warrant for $4,228.33 in full payment of its delinquent 1924 construction charges.

BOARD OF SURVEY AND ADJUSTMENTS MAKES REPORT

Secretary Work, in transmitting report to Congress, states that if all grievances and sources of loss enumerated under subsection Kare disposed of at this time, the obligations assumed by water users should hereafter be discharged in full

ESTIMATING losses on Federal reclamation projects at a total of $27,102,287 due to lack of fertility of the soil for which irrigation works were constructed, inadequate water supply, and other physical causes, the report of the Board of Survey and Adjustments has been submitted to Congress by Secretary Work.

Projects included in the survey upon which the Government has sustained losses number nineteen. Of the total $27,102,287 the board fixes $14,317,150 as a definite loss and recommends that this amount be charged off, while $12,735,137 is given as a probable loss with recommendation that this sum be placed in suspense account.

In his letter of transmittal to Congress, Secretary Work stated he was unable to approve of some of the recommendations contained in the report because it was believed that they were not within the scope of their authorization under subsection K of the law providing for the survey or that they introduced principles which would render future development so hazardous and uncertain as to destroy or seriously interfere with the administration of the reclamation act. He explained further that these exceptions were more important as to principles than as to the money involved and that they would be explained if such explanations were desired by Congress. The Secretary also stated in his letter that bills designed to carry out those recommendations in which the Department concurred were in the course of preparation. Continuing the Secretary said:

"The fact that the relief recommended is above the estimates contained in the fact finders' report, which led to this survey, should not operate against its favorable consideration by Congress. It is reported as desirable that all grievances and sources of loss enumerated under subsection K be disposed of at this time. If this is done the obligations assumed by water users on these projects should hereafter be discharged in full."

The Board of Survey and Adjustments in submitting its report asserted that the welfare of the projects would be greatly promoted by the early disposition of its recommendations. "Human lives are being worn out unnecessarily in the futile attempt to win a living from lands without productive value, many of which can not by any known means be brought into profitable cultivation. These people, fighting against insurmountable odds, should receive immediate relief. On several of the projects real or fancied errors in the fixing of acre costs cause distrust and dissension. An early settlement of all such matters will hasten the development of good feeling and constructive efforts on the projects.

"The projects generally are in prosperous condition. The Federal venture in irrigation promises success. There should be fewer difficulties in future operations under the reclamation act, if the experience of the past be heeded. The losses, as indicated by this report, are large, but we have felt that we would serve best, by stating fully and frankly the conditions brought to our attention. Fancied security is dangerous.

RECLAMATION

"The reclamation funds are derived from western lands.

"Not a dollar comes from the taxpayer's poeket.

"The fund is being repaid.

"The reclamation fund is revolving.

"Domestic markets are ereated in a large way for domestie goods.

"Reclamation distributes and equalizes our population.

"It makes for national defense.

"It creates wealth, puts worthless lands on the tax rolls of the various States, and makes Federal income-tax payers by the thousands.

"And best of all—reclamation brings settlers to the farm, the best abode for man."—From speech by Hon. John W. Summers, of Washington, in the House of Representatives, January 7, 1926.

"You will observe that the total losses as recommended by us are somewhat larger than those suggested by the fact finders. This is due chiefly to the discovery of lands without productive power, by the detailed survey of this year, which were not known to the fact finders. Otherwise, our findings and those of the fact finders are in very close agreement. On some of the projects a contractual surplus or accumulated profits will partly offset the losses. That does not, however, change the fact that the resources of the project are diminished by the sums represented by the losses as recommended in this report. The water now appurtenant to lands recommended for exclusion may in the future become a source of revenue to offset the losses herein recommended."

A tabulated summary of the losses on the projects surveyed by the board follows:

Project	Probable loss	Definite loss	Total loss
Belle Fourche	$734,618	$544,521	$1,279,139
Boise	495,369		495,369
Carlsbad	45,867		45,867
Grand Valley	1,344,409	760,628	2,105,037
Huntley	719,642	168,981	888,623
King Hill	287,024	531,958	818,982
Klamath	62,711	170,684	233,395
Lower Yellowstone	607,017	382,254	989,271
Milk River	1,878,656	1,946,189	3,824,845
Minidoka	132,787	9,172	141,959
Newlands	813,264	4,536,396	5,349,660
North Platte	2,599,987	237,877	2,837,864
Okanogan	99,473	720,700	820,173
Rio Grande		43,158	43,158
Shoshone	534,006	1,715,666	2,249,672
Sun River-Fort Shaw	131,940	125,531	257,471
Umatilla	484,088	1,054,940	1,539,028
Uncompahgre	1,436,155	1,365,427	2,801,582
Yakima	378,124	3,068	381,192
Total	12,785,137	14,317,150	27,102,287

The Board of Survey and Adjustments was appointed in January, 1925, and spent the greater part of last year in making a comprehensive and detailed study of the Federal reclamation projects. Its members included: Thomas E. Campbell, chairman, southern board; John A. Widtsoe, chairman, northern board; F. M. Goodwin, Reclamation Bureau representative; Andrew Weiss, Reclamation Bureau representative; E. O. Aylesworth, representing Colorado; Warren G. Swendsen, representing Idaho; I. D. O'Donnell, representing Montana; George E. Condra, representing Nebraska; George B. Thatcher, representing Nevada; H. L. Kent, representing New Mexico; W. A. Delzell, representing Oregon; B. F. Myers, representing South Dakota; M. M. Moulton, representing Washington; and A. J. Martin, representing Wyoming.

During the past year there were large increases in the number of horses, sheep, and fowls on the Minidoka project, Upwards of nine carloads of dressed poultry were shipped from Burley and Rupert this past fall, bringing the growers $65,000.

Feeding operations on the Lower Yellowstone project are the most extensive in the history of the project. Stock made some remarkable gains and the industry will show good returns.

BUILDING OF BOULDER CANYON PROJECT RECOMMENDED

Proposed development includes dam 550 feet high, creating a reservoir holding 26,000,000 acre-feet of water; works for generation of electric power; and an all-American canal starting at Laguna Dam and delivering water to Imperial and Coachella Valley canals

CONSTRUCTION of the proposed Boulder Canyon project for the protection and development of the lower Colorado River at an estimated cost of $125,000,000 through a bond issue by the United States has been recommended by Secretary Work in a report submitted to the Senate Committee on Irrigation and Reclamation.

Suggesting modifications in the present Senate bill, the Secretary declared that the general plan and purpose of the measure, which was to regulate and control the flow of the river below the dam to prevent floods, to increase the water supply for irrigation, to provide domestic water supply, to generate electric energy and contribute to the general prosperity of the southwestern part of the country, had his support as a national undertaking to be carried out and administered by the Federal Government. Stating that the Federal Government should preferably be entrusted with the protection of such rights or distribution of its opportunities, or with its international relations he said that all uses of the undertaking can be coordinated and the fullest benefits realized best by central control. If the proposals in the Secretary's report are adopted, protection of the upper Colorado River States is assured.

Discussing the building of the project through a national bond issue, Secretary Work asserted that it should be a sum sufficient to provide for the construction of the dam, the power plant and the all-American canal and that an additional sum should be included in the authorization to pay interest on bonds sold during the period of construction and until such time as the revenues will meet interest charges. Providing the money for this development through a special bond issue, he continued, would obviate disturbance of the regular fiscal operations of the Government and would also obviate provision by the Budget for the money needed during construction. The bonds could be sold as the money would be needed, the construction extending over a period between 5 and 10 years, if work were carried on at a rate to secure the greatest efficiency.

The Secretary expressed opposition to the allotting of power privileges, as proposed in the Senate bill, and advocated the building of a unified power plant by the Federal Government as more efficient and cheaper resulting in the elimination of controversies between applicants and long delays in their adjustment. Continuing he stated that the area for the location of separate plants was restricted and allotments would not be equal in value. Some allottees, therefore, would have an advantage over others, which would result in the creation of operation and administration controversies that unified development by the Government would avert.

Transmission lines for the distribution and retailing of electric power from the Government central plant, the report proposed, should be financed by the purchasers. To secure the greatest economy, main transmission lines leading to different localities should be constructed for joint use. This plan of power development, the report asserts, is not an experiment having been adopted by the Federal Government with satisfactory results in the construction of other reclamation works, where the generation of power is incident to irrigation development. Salt River, Minidoka, Lahontan, and Guernsey were cited in illustration.

The report also discusses at length the proposed All-American Canal, pointing out that the existing contract with the Mexican Government gives the use of half of all the water diverted to that country and suggests the revision of this agreement, the sale of water for domestic uses and for the irrigation of lands under the provisions of the reclamation act and the Warren Act. In conclusion, Secretary Work presents a financial statement showing the estimated capital investment and annual operating expenses and receipts under the proposed plan of construction and operation through a Federal bond issue.

The total cost of the project is estimated at $125,000,000 including $41,500,000 for a 26,000,000 acre-foot reservoir, $31,500,000 for 1,000,000 horsepower development, $31,000,000 for the All-American Canal, and $21,000,000 for interest during construction on above, five years at 4 per cent. The annual gross operating revenues are estimated at $12,300,000 of which $10,800,000 would accrue from the sale of 3.6 billion kilowatt hours of power at 3/10 cents and $1,500,000 from storage and delivery of water for irrigation and domestic purposes. The fixed annual charges are estimated at $6,200,000 representing $700,000 for operation and maintenance, storage, and power; $500,000 for operation and maintenance of the All-American Canal; and $5,000,000 for interest on $125,000,000 at 4 per cent. The annual surplus is estimated at $6,100,000, thought to be sufficient to repay the entire cost in 25 years. The reoprt in full follows:

"I have received your letter of December 23, transmitting, with request for report, a copy of S. 1868, entitled 'A bill to provide for the protection and development of the lower Colorado River Basin.'

"Instead of discussing the provisions of this bill, section by section, I desire to submit some suggestions regarding the policy and procedure to be followed in this development and the legislation required to secure the desired results. It is assumed that the dam and reservoir to be created are essentially those described in a report of the Bureau of Reclamation dated February 28, 1924, which proposes a dam 550 feet high, and a reservoir to impound 26,000,000 acre-feet of water, and that the All-American Canal for connecting the Colorado River with the Imperial and Coachella Valleys is substantially the one described in Senate Document No. 142 and in the report of the All-American Canal Board published in 1920.

"It is my understanding that the primary purpose of this scheme is to regulate and control the flow of the river below the dam, so as to lessen the menace from floods to low-lying land below, to increase the water supply for irrigation in seasons of drouth, and provide an adequate water supply at all seasons of the year for household and industrial uses in growing cities and towns, and to generate electric energy both as a means of making this project a financially solvent undertaking, and contributing to the general prosperity of the southwestern part of the country. The general plan and purpose of this measure has my support, and I favor it being made a national undertaking, to be carried out and administered by the Federal Government.

"Interstate and international rights and interests involve the diversified benefits from the construction of these works the waiting necessities of cities for increased water supplies, the large development of latent agricultural resources, the protection of those already developed, and the immense industrial benefits which may come from the production of cheap power, which together appear to render the construction and subsequent control of these works a measure of such economic and social importance, that no agency but the Federal Government should be intrusted with the protection

of rights or distribution of its opportunities. All uses can be coordinated and the fullest benefits realized only by their centralized control.

"I shall therefore consider this development as including three features:

"(1) A dam approximately 550 feet high creating a reservoir holding 26,000,000 acre-feet of water.

"(2) Works for the generation of electric power.

"(3) An all-American canal starting at Laguna Dam and delivering water to the Imperial and Coachella Valley canals.

"The reservoir should be regulated, primarily to safeguard the valleys in Arizona and California, including Imperial Valley with its present extensive development from the destructive effect of large floods. Water levels in the reservoir would be raised during flood periods and lowered at other times, thus equalizing the discharge of the river below and securing a regulated flow for irrigation and power. The water so impounded should be sold to cities requiring it for domestic purposes and other municipal uses and to irrigation districts, like that of the Imperial Valley, desiring a complete or supplemental water supply under the provisions of the Warren Act, payment to be made for a definite volume of water each year.

"The electric energy generated should be sold to the highest and best bidders, with due regard to public interest, at the switchboard of the power plant. Contracts should not exceed 50 years in duration. Transmission of power and its distribution to be provided by the purchasers.

"Water supplied for domestic, industrial, or irrigation uses should be delivered at the dam, at points along the river agreed upon, and at the terminal of the all-American canal. Prices for this water should be such as to at least repay all of the cost of operation and maintenance of the canals and an equitable part of the operating expenses of the dam. This, with the revenues from power, will, we believe, repay the entire investment in this development with 4 per cent interest.

"The money for this development should, I believe, be provided by a bond issue of the United States. It should be for a sum sufficient to provide for the construction of the dam, the power plant, and the all-American canal. An additional sum should be included in the authorization to pay interest on bonds sold during the period of construction, and until such time as the revenue will meet interest charges. Providing the money for this development through a special bond issue will obviate disturbance of the regular fiscal operations of the Government. It will obviate provision by the Budget for the money needed during construction. The bonds could be sold as money would be needed. Construction would extend over a period of between 5 and 10 years if work were carried on at a rate to secure the greatest efficiency.

"In the sale of water to irrigation districts and municipalities, the provisions of the reclamation act and of the Warren Act would apply.

"Such an adjustment of burdens and benefits should stimulate irrigation development because of the generous terms on which water will be supplied, and at the same time result in a considerable revenue from the water furnished for irrigation, domestic and industrial uses. But the money-earning feature of this development is power. The revenues from the sale of power will, it is believed, alone repay the entire cost of these works with interest at 4 per cent.

"With this general outline of the development program favored, I submit comments on features of the bill which are approved and others which it is believed should be modified.

"The necessity for the all-American canal and the size and cost of this canal depend largely on whether the existing concession under which water is now diverted from the Colorado River at Hanlon's Heading and carried through Mexico to irrigators in the Imperial Valley can be modified. If it can not be then the all-American canal becomes an indispensable part of this development. Under this contract, or concession, the Mexican Government gave a corporation permission [1] to build and operate a canal across Mexican territory to irrigate land in California on condition that Mexican irrigators be given, if they desire it, one-half of all the water diverted into this canal from the Colorado River. Hence, the canal has to be double the capacity required to meet the needs of California. The river has to supply double the water needed in California and the rights of Mexicans to water under this concession grow as the irrigated area is extended in California.

[1] The Sociedad de Riego y Terrenos de la Baja California S. A., is authorized to carry through the canal which it has built in Mexican territory, and through other canals that it may build, if convenient, water to an amount of 234 cubic meters (10,000 cubic feet) per second from the waters taken from the Colorado River in territory of the United States by the California Development Co., and which waters this company has ceded to the Sociedad de Riego y Terrenes de la Baja California S. A. It is also authorized to carry to the lands of the United States the water with the exception of that mentioned in the following article."

"From the water mentioned in the foregoing article, enough shall be used to irrigate the lands susceptible of irrigation in Lower California with the water carried through the canal or canals, without in any case the amount of water used, exceeding one-half of the volume of water passing through said canals."

"The canal now supplies water for the irrigation of over 400,000 acres in California, and irrigators in Mexico at present require water for the irrigation of 200,000 acres. But Mexican irrigators are entitled, under this concession, to double the volume they are now using, or for enough to irrigate as many acres as are now irrigated in California. That is more water than the unregulated flow of the river will now supply. As the Mexican irrigators are on the upper end of the canal, the pinch of scarcity, when it has come in the past, or when it may come in the future, falls first on irrigators in the United States, which country supplies the water, all the construction cost and all the money advanced for operation, It is unfair to California irrigators now, and will be even more so after the reservoir is built.

"It is physically possible to irrigate much more than 400,000 acres from this canal in Mexico. If this concession remains in force without any amendment and the canal continues to be used as now, the irrigated area in Mexico will continue to extend. The volume needed to be diverted from the river would be more than the direct flow at the low water season, and the area irrigated in California would be subject to ruinous uncertainties and loss. If storage is provided, a part of the water for the irrigation of lands in Mexico would, under this concession, have to be supplied from the reservoir, as this canal would be the only means of conveying water to the Imperial Valley and it can be operated only if the terms of the Mexican concession are complied with.

"If, however, the Government of Mexico would consent to a modification of this concession and definitely limit the volume of water to which Mexican irrigators would be entitled, then the future use of the present canal would be economical and desirable, a smaller high line could be built and utilized mainly for the irrigation of the higher lands of the Imperial and Coachella Valleys. Thus far, no negotiations for the modification of this concession have been made. It is not known what the attitude of the Mexican Government would be, and plans for this development should therefore include provision for an all-American canal as an essential part of the scheme.

"The building of a unified power plant by the Federal Government in the place of allocating power privileges, as proposed in the bill, is regarded as more efficient and cheaper. It will obviate controversies between applicants, and long delays in their adjustment. In the end, results will, I believe, be superior to those possible under an allocation of

(Continued on page 22)

BOULDER CANYON PROJECT

(Continued from page 21)

privileges. The area for the location of separate power sites is restricted. Allotments would not be equal in value. Some allottees would, therefore, have an advantage over others. It would result in the creation of operation and administration controversies to be avoided and which a unified development will avert.

"The transmission lines for the distribution and retailing of this power should be financed by its purchasers. To secure the greatest economy, main transmission lines leading to different localities should be constructed for joint use. This plan of power development is not an experiment. It has been adopted by the Government with satisfactory results in the construction of other reclamation works, where the generation of power is an incident to irrigation development. Salt River, Minidoka, Lahontan, and Guernsey are illustrations.

"Section 6 provides that no part of the construction cost of the dam and the appurtenant works shall be charged against any lands irrigated by the waters of the reservoir. If the all-American canal is to be considered as an appurtenant work, the bill should be amended. It is believed that the sales of water from this canal will return not only the cost of operation and maintenance, but pay construction costs without interest, as is done on other reclamation projects.

"All revenues from power, irrigation and domestic water supplies should be placed in a common fund and used for the payment of interest, operating expenses and build up a sinking fund for redeeming the entire bond issue.

"In order to give assurance before any large expenditure is incurred that the anticipated revenues from this development will be obtained, the bill should contain a provision that before any bonds are issued and sold and before awarding any contracts for construction, the Secretary of the Interior shall secure the execution of contracts with irrigation districts, municipalities, and corporations, on terms to be fixed, for the delivery of all water to be supplied for irrigation, domestic, and municipal uses, and shall obtain definite commitment for the purchase of power from responsible bidders in an amount to insure a sufficient return from this development to repay the money to be expended with interest within a period of 50 years.

"Section 8, which provides for the distribution and use of all water for irrigation, power, and otherwise, in accordance with the Colorado River compact, seems well conceived and is a necessary part of this legislation. This appears to afford ample protection and assurance to those States included in the upper division of the watershed against the creation of a priority of right through the building of these works which would impair in any way their right to the volume of water guaranteed to that division in the compact. I suggest for consideration amendment to the effect that the benefits to be derived from this development shall be available only to those States or the citizens of those States which have ratified the compact.

"I suggest the amendment of section 9 as follows: In line 1, page 11, strike out the words 'the proportionate share' and insert in lieu thereof the words 'an equitable share in accordance with the benefits received.' After the word 'lands' in line 15 insert 'subject, however, to the provisions of subsection o of section 4, act of December 5, 1924 (43 Stat. 702).' The first amendment suggested is designed to avoid the necessity of fixing a flat-rate charge without regard to the classification or quality of the land. Experience has shown that a flat-rate charge is undesirable in some cases. The second amendment I believe of prime importance. If soldiers and sailors are to be given a preference, experience has shown that provision should be made for selection. This is desirable for the protection of all prospective entrymen, soldiers and sailors, as well as civilians.

"Since section 1 provides for the building of a dam either at Black Canyon or Boulder Canyon, I suggest that line 11, section 10, be amended so as to designate the subfund there mentioned as the 'Colorado River Dam fund' which would be applicable in either case. The present designation might possibly prove a misnomer. I suggest the following proviso be inserted at the end of section 10 of the bill:

"'Provided, however, that no work shall be begun and no moneys expended on or in connection with the works or structures provided for in this act until the respective legislatures of at least six of the signatory States mentioned in section 13 hereof shall have approved the Colorado River compact mentioned in said section 13, and shall have consented to a waiver of the provision of the first paragraph of article 11 of said compact making the same binding and obligatory when it shall have been approved by the legislatures of each of the seven signatory States, and until the President, by public proclamation, shall have declared that the said compact has been approved by and become binding and obligatory upon at least six of the signatory States.'

"An approximate estimate of cost, operating expenses, and income leaves no question as to the ultimate solvency of this undertaking if carried out along the ines proposed. The main source of revenue will be power and the rate assumed is lower than the wholesale prices now being paid in the West. Those of which we have information range from 3½ to 8 mills per kilowatt-hour, measured at the switchboard. As the largest consumers of this power would be distant, a low figure of 3 mills per kilowatt-hour at the switchboard has been assumed in the estimates which follow:

Colorado River development, Boulder Canyon Reservoir, all-American canal

CAPITAL INVESTMENT

Estimated cost for:	
26,000,000 acre-foot reservoir	$41,500,000
1,000,000 horsepower power development	31,500,000
The all-American canal	31,000,000
Interest during construction on above, five years, at 4 per cent	21,000,000
Total	125,000,000

ANNUAL OPERATION

Estimated gross revenues from:	
Sale 3,600,000,000 kilowatt-hours, power at ⅓ cent	10,800,000
Storage and delivery of water for irrigation and domestic purposes	1,500,000
Total	12,300,000
Estimated fixed annual charges for:	
Operation and maintenance, storage and power	700,000
Operation and maintenance, all-American canal	500,000
Interest on $125,000,000 at 4 per cent	5,000,000
	6,200,000

Estimated annual surplus, $6,100,000, or thought to be sufficient to repay the entire cost in 25 years.

"The height of this dam as fixed will not prevent the construction of the proposed dams at Diamond Creek or Bridge Canyon. The approval of this project should open the way for other development, and encourage the construction of projects above this dam for development of irrigation, power, or other purposes.

"Although the difficulties of construction and magnitude of the proposed structure compared with any other for similar purposes are unprecedented, assuming that it is a feasible engineering possibility, the Reclamation Bureau of the Department of the Interior, as now organized, with its present commissioner, is competent to construct the works contemplated in S. 1868.

"With the amendments suggested, I recommend the favorable consideration of this bill by Congress."

THE value of crops grown on the Sunnyside division of the Yakima project in 1925 amounted to $8,978,770, or $114.42 per acre, compared with $4,923,820, or $63.02 per acre in 1924. On the Tieton division the value in 1925 was $3,025,200, or $130.97 per acre, compared with $3,194,820, or $130.16 per acre in 1924. For the project, as a whole, the increase amounted to nearly $4,000,000.

CONSERVATION OF WATER ESSENTIAL

Elephant Butte Irrigation District approves more efficient system of water deliveries by rotation instead of by demand, with a view to preventing distribution wastes and conserving water for the increased project acreage under cultivation

Editorial from the Rio Grande Farmer

THERE has been a great deal of discussion recently among project farmers of the matter of improving water deliveries. Probably this subject has received more attention during the past season than in all the previous history of the Rio Grande project.

During the past season an attempt was made to work toward an efficient rotation system of deliveries. It is proposed by the Government to take further steps toward this end during the coming season, with a view to perfecting the most practical system of rotation.

This policy has had the approval of the great majority of project farmers, but now and again one hears some expression of fear that this system will hamper some particular type of farming.

The rotation system of deliveries does not in any sense contemplate the enforcement of harsh rules to that point where any particular type of farming will be eliminated or hampered. Rotation, according to the plans proposed, will not prevent the vegetable farmer from carrying on his business, as apparently is feared by a few project farmers.

While it undoubtedly is true that under certain conditions a demand system of irrigation will prove satisfactory, it is also true that under other conditions it is absolutely necessary to adopt a system of rotation. The latter undoubtedly is the case in the Rio Grande project.

The history of this project shows that where little regard is paid to a system of rotation approximately 40 per cent of the water taken from the reservoir is wasted down the stream. It is inconceivable that this condition can continue, now that the project is nearing complete development and all lands soon will be irrigated. The project area of 155,000 acres, when all in cultivation, will not permit of such waste, and the ultimate utilization of both our water and power assets demands that steps be taken to secure the greatest possible efficiency in the use of water, thereby reducing the discharge necessary at Elephant Butte.

Every thousand acre-feet of water that is lost means a decrease in the possible agricultural production of the project, and it means a decrease of at least $750 net in potential annual power receipts. Such waste, of course, ultimately would greatly endanger our land values as well as our power prospects. Further, the canals of this project, although of much larger capacity per acre served than in many other irrigated sections, are entirely inadequate to serve the project acreage unless there is a systematic system of deliveries. We have seen, during the past year, that the irrigation peaks, partially due to the desire of all farmers to get water at the same time, occasioned some distress which could have been all alleviated by a little more system in rotation.

Rotation means better service because water users can plan their work more exactly, knowing when they can secure their water, and it also undoubtedly will mean closer supervision of the water where it is checked up, with a consequent lessening of ditch breaks.

It can readily be understood that because of varying conditions on different projects, a rotation system is of much more importance in one project than it may be in another. In a long shoestring project, such as the Rio Grande, where some parts of the project are distant about seven days from the source of regulation and supply, it becomes especially necessary that rotation be practiced, as the great daily variation in different sections under a demand system must be obviated as nearly as possible in order to permit the close regulation at the reservoir that is necessary to prevent waste.

The figures on last season's run-off of the Rio Grande basin show that the water supply during the past year was one of the lightest on record. Up to November 30, only 374,000 acre-feet came into the reservoir, and during the same period there was discharged from the reservoir more than 800,000 acre-feet. In addition, there were other heavy losses within the reservoir, due to evaporation and other causes. Not since 1902 has there been such a meager annual flow at San Marcial. Engineers who are thoroughly conversant with the normal run-off and with the reasoning that led to the construction of the Elephant Butte reservoir to its present capacity, agree that wisdom dictates that we should now make every attempt to prevent the waste of water and initiate further economies to provide for the future rapid expansion of the project's irrigated area. This means nothing more than a policy of adopting the refinements of water deliveries which are found now in all sections where the water supply has been generally appropriated and has become valuable.

The regulations put into effect during the past year, although only a start in the right direction, produced gratifying results. In spite of an increase in the area irrigated of practically 20,000 acres, the discharge at Elephant Butte was reduced nearly 200,000 acre-feet. The estimated discharge at Elephant Butte for 1925 is 814,137 acre-feet. Government engineers estimate the safe annual draft on the reservoir to be 720,000 acre-feet. In other words, we should still cut the discharge 96,000 acre-feet.

The theoretically controllable waste below the project last year was 179,652 acre-feet. It is believed that by cooperation between the Reclamation Service and the water users in elimination of waste, the project can, without suffering undue hardships, accommodate its demands to the established safe annual draft.

It is borrowing trouble, either for an individual or an irrigation district to draw on its assets faster than there is possibility of their being replenished. As business men and as prospective power merchants, water users find it necessary to take a business-like view of the situation.

The cooperation of the farmers of the project will greatly hasten a solution of the water delivery problem. One of the things most strongly urged upon the water users is the benefit to be gained by starting the season with clean and properly constructed ditches and farm laterals, in order that they will take water in quantities best adapted to efficient and prompt irrigation. Much of the dissatisfaction expressed in the past by farmers who had difficult irrigation would have been obviated, it is claimed, if they had anticipated their summer needs and had prepared their ditches so that they would have ample capacity for the irrigation demands of their farms. Many farms on the project suffered loss last year, it is said, because of the impossibility of irrigating at the right time and with proper rapidity, due to the fact that the ditches were in such condition that it was impossible for them to function properly.

SMOOTHING THE PATH OF COLONIZATION[1]

By Dr. John A. Widtsoe, chairman, northern division, Board of Survey and Adjustments

THE settlement of the United States has been accomplished in comparatively recent times and under modern conditions. It should therefore be possible to apply the results of our vast colonization experience to our present-day problems. If the experience of the past had been heeded more, there would have been fewer failures in our attempts to establish colonies on our unused lands.

In the history of American colonization two ventures, conducted on a large scale, are of particular value in revealing the fundamental principles of successful colonization. The first of these is the settlement of the Great Basin and the Colorado River Basin by the pioneers of Utah. The second is the Federal venture in irrigation under the reclamation act of 1902.

The Utah colonization, which began in the valley of the Great Salt Lake in the summer of 1847, has spread, until settlements are now found in all the States of the Great Basin and the Colorado River Basin. Nearly all have met with unvarying success. Half a million prosperous people, two-thirds of whom are farmers, are carrying on the initial experiment of 1847. The United States Bureau of Reclamation has conducted its work in every Western State; more than 2,000,000 acres have been brought under water, and 200,000 people live on the lands reclaimed under the reclamation act. The history of those two developments should be helpful to those who now are engaged in colonizing lands.

An adequate project.—These experiences teach, first, that no enterprise in colonization can succeed unless the project is adequate to enable the farmer to meet his obligations and to live life properly in this day of high civilization. That crops can be grown is not sufficient evidence that a project is fitted for colonization.

The main question in colonization is whether the colonists, brought on the land, will remain on the land. The colonist-visitor injures a project; the colonist-settler determines its success. The test of a successful marriage is not the love of courtship days, but the love that persists after the wedding.

The experience of the Utah pioneers showed clearly that every colony placed on fertile land, with sufficient water supply, and under conditions enabling the reasonably industrious and thrifty farmer to live up to the standards of his day, was successful. When, by mischance, the people settled on infertile lands, or lands with insufficient water supply, or under adverse conditions beyond control, failure resulted.

In short, the farm must pay. Doctor Work's committee of special advisers on reclamation came to the same conclusion. Their most outstanding finding was that most Federal reclamation troubles could be traced to inherent conditions that made large areas incapable of satisfying the economic, social, and religious needs of the industrious, intelligent settler. This year's Board of Survey and Adjustments has confirmed this view by actually determining, by careful land classification, that a large proportion of Federal project lands is infertile or without water supply or unproductive for other reasons, and therefore incapable of producing crops profitably.

The beginning of colonization wisdom is to make certain that the projects to which prospective colonists are invited are inherently capable of successful development. Projects which can not reward the farmer sufficiently to pay his obligation and to support his family in some comfort should be suspended from colonization efforts until such time as economic conditions change, or new knowledge permits a more profitable use of our resources. Human life is precious. The colonizer who knowingly or carelessly places men, women, and children on inadequate lands, there to waste their lives in a hopeless struggle, should be classed with the criminals, and be treated as such.

Selection of settlers.—The second great colonization lesson taught by experience is that the prospective colonist must be selected according to his fitness to live and labor under prevailing project conditions. It takes a man of distinct gifts to become a successful farmer. In land reclamation, the farmer is the heroic figure. Capitalist and engineer must wait for their full rewards until the farmer by his unending toil has made the vision of the engineer and the dream of the banker come true. All men may love the land; but not all men can win a living from it. The margins of agricultural profits are small; and the problems many and intricate.

Training in agriculture is not indispensable; it is desirable to have it. Many a city man has become a successful farmer; and, frequently, men with farm experience have failed as independent colonists. The test is, rather, love of the work and the ability to manage affairs intelligently.

The people who settled the projects of the Latter-Day Saints came from many countries. The majority were Americans, but many came from England, Scandinavia, Germany, and other parts of the world. A large proportion came from industrial centers and knew little of agriculture. Nevertheless, the majority succeeded. The process of selection had secured, before they came West, only self-reliant people, able to make up their own minds and courageous for the truth as they understood it, who would join an unpopular church, leave home for distant lands and forsake accustomed comforts. The very qualities that made them able to do this were the qualities necessary in the colonies when the conquest of unfavorable conditions was the first task. The man of leadership, loving life in the open country, possessing a knack of turning to his advantage the vagaries of wind and weather, hopeful in the face of changing seasons, made money on the land, and happily raised his family there. The weaker man either eked out an existence or found a position where someone else carried the responsibility of providing for the weekly pay check.

On the Federal projects all manner of men were invited to accept the new opportunities. The special advisers on reclamation found that many project troubles could be traced to the lack of selection. Men desirous of land ownership, but temperamentally or physically unfitted for the work, came on the projects only to fail.

Helping the farmer.—A third lesson taught by our colonization experience is that, though settlers are fitted for agricultural life, they must be given aid. Agriculture has become a complex art; no man can know all the facts upon which it rests. The farmer needs specialized help. The Federal and State Departments of Agriculture are making such technical aid generally available, but there is much yet to be done before every farmer can obtain necessary advice in time of need. Any plan of colonization should include provision for such aid.

The settler also requires financial aid. The man who has made a fortune elsewhere is seldom induced to become a colonist of a new project. Future colonization will be made largely with young men, ambitious for independence, but with little money. In the beginning, such men will require financial aid with

[1] Address delivered before the Conference on Reclamation and Land Settlement, Dec. 14, 1925.

which to build their houses and to equip their farms and, later, occasional help between harvests, until their growing bank accounts make further help unnecessary.

However, whether technical or financial aid is given, we must not, as a condition, compel the farmer to follow programs prepared for him. In successful agriculture, the farmer must preserve the independence of his actions; his work can not be planned for him. He must be a free agent. Nevertheless, the giving of aid, especially financial aid, enables those in charge of colonization to offer supervision and direction which the farmer usually needs, and nearly always accepts if given in the right spirit.

In the Utah settlements, the bishop and his two counselors stood at the head of a group numbering from 500 to 1,000 souls. These men were ready to assist in the material as well as in the spiritual needs of the people. Commonly they took the lead in all community enterprises. Under the organization of the church they could call to their assistance other men and women, until all required aid became available. When the need appeared sufficiently great, the church itself would give financial assistance.

The history of the Federal reclamation projects shows without question the necessity of technical and financial aid, and that it should be given, not grudgingly but carefully, in a generous spirit. Wherever this has been done prosperity has come to the settlers.

Community organization.—There has come out of our settlement experiences the fourth lesson, that strong men on fertile, well watered lands and with ample aid, may fail unless they are properly organized for community life. Social are quite as important as economic needs. "Man does not live by bread alone." The colonization history of the country shows the desirability of community organization for social as well as for economic advantage.

Community organization was fundamental in the colonization procedure of the Mormon Church. A group of people, 500 to 1,000, were organized into a "ward." A strong man was called to preside over them, with the title of "bishop." He was given two men to serve as his counselors. A church or meeting house, the community gathering place, was built as soon as possible. The organized community thus established, the ward held religious meetings on Sundays and other days; at other times meetings to discuss the economic welfare of the group were held; and the people met frequently in a social capacity to enjoy the dance and other forms of recreation. Moreover, by a system of ward "teaching" or visiting, every household was visited regularly, by appointed members of the community, and the conditions of the people reported to the bishop. In this way the needs of the members of the community were made more thoroughly known to the leaders. This method of organization is carried out thoroughly in the hundreds of Latter Day Saints settlements from Idaho to Mexico. Ordinarily the members of the ward were grouped in close settlements, the houses and barns placed on city lots, large enough for a kitchen garden and the maintenance of a cow or two; while the farms surrounded the settlements at varying distances. It was felt that the loss in time in going to the farm was more than compensated for by the benefits of compact community life. Out of such community association came a system of cooperation, unsurpassed, on a large scale, in the development of the country. It may be that cooperation, itself, the main key to national agricultural success, depends on community organization and activity. When a ward grew in membership until it was too large for three men to handle, it was promptly divided into two or more wards.

The conditions of our day, involving many new demands, may compel future colonization enterprises to give such community organization first consideration. The value of the plan has been fully demonstrated by the Latter Day Saints. The maintenance of a relatively small group of people, under a system of self-government, characteristic of the Mormon Church, serving the religious, economic and social needs of the people, has contributed greatly to make the adventure in colonization successful.

The special advisers on reclamation found that community organization on the Federal irrigation projects had similar good effects. The settlers themselves had discovered it, and in many places had set about to form organized communities, out of which had grown a cooperative understanding and many successful cooperative enterprises. There can be no question about the importance of this lesson in future colonization.

The spiritual factor.—Finally, a fifth lesson taught by our colonization experience is difficult to define, yet of first importance.

The success of the Mormon settlement activity, while resting upon a few simple principles, already outlined, was given life, strength, and permanence by a strong religious feeling. The things of the spirit are more important than those of the body. Spiritual forces cement the activities of mankind. Political, economic, and social forces are of secondary importance. In witness, we many recall that, in American colonization, the Church has always been utilized by those who have been most successful. Out of the communities held together by strong religious appeals, have come the leadership which has built rural America, and preserved our American institutions.

The farmer especially must find his reward in the intangible realities. It is improbable that, in our day, the income from farming, counting the investment and labor, will be as large as in other industries. Agriculture is only in part a business; it is more a mode of living. To live in the open, to stand on one's own land; to labor independently of regulations; to match wits with nature and man; to raise one's family under conditions that breed strength of soul as well as of body—such spiritual rewards must compensate him for the lower cash income from his efforts.

It is doubtful if farming can ever be valued correctly on the basis of its money yield. There must be a spiritual purpose in every community, to make coherent and intelligible community activities. Life must be purposeful; else there will be no goal to which the community is aiming. Can we, of many creeds, as we continue our colonization, find an equivalent of the spiritual impulse? Can a community be made to feel the gain in the exchange of money for living? Perhaps, the best we can do is to see to it that the Church goes with the settler, so that he may be guided into visions of the great purposes of human life. However accomplished, it must be done. The acceptance of a coherent spiritual purpose in life is the most effective means of assisting a community to achieve success and happiness.

Summary.—To smooth the path of colonization, we must learn these five lessons with others that time does not permit of discussion taught by the best experience of the past:

1. That the project to be colonized, when industriously and intelligently tilled, must return an income sufficient to enable the farmer to pay his obligations and to live a life worthy of our high civilization.

2. That men placed on the farm must be fitted by temperament and health for work in the open country.

3. That the farmer must be provided, as needed, with the necessary technical and financial aid, and the proper leadership must be found to guide him.

4. That the settlers should be organized into communities for their economic, social, and religious welfare.

5. That the religious impulse is necessary to achieve high and lasting success on a colonization venture.

A plan of colonization built about these principles is fairly certain of success.

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NEED OF COMMUNITY ORGANIZATION[1]

By Dr. W. W. Long, Clemson College of Agriculture, South Carolina

OUR agricultural leaders of to-day are doing some thinking and much generalization concerning organized agriculture. They tell us how necessary it is for the farmers to organize, how the industries and commerce have prospered through organization. In all of which the farmers and those interested in agriculture heartily and unanimously agree.

But what do the agricultural leaders mean by organized agriculture? What definite and specific steps do they advise that the blessings of organized agriculture may have a beginning?

Great emphasis is placed upon cooperative marketing. Cooperative marketing is one phase of organized agriculture, and an important one, but agriculture can not be organized around one branch. There are other factors involved in organized agriculture consisting of many activities, not only of an economic character but of a productive, educational, religious, and recreational type. Also, organized agriculture develops rural leadership, which is so woefully lacking to-day in our rural civilization.

Agriculture can not be organized with the county or the State as a unit. One of the troubles with our marketing associations, for example, is their inability to keep in touch with individual members. Men show their greatest interest in the organizations in which they play a personal part in the meetings and are constantly coming in contact with the beneficial effect of their organizations.

Therefore, it seems that agriculture, for these reasons and others, can best be organized through communities with their community centers.

ORGANIZATION AND OFFICERS

The first step in organizing a community is the selection of good community officers, including a president, a vice president, and a secretary-treasurer, these officials to be elected from and by the people of the community.

The president would be empowered to appoint an executive committee of such a number as may be thought best. This executive committee, in cooperation with the president, would select the necessary committees to take charge of the different community activities.

The secretary-treasurer should be carefully selected, a trained man, familiar with large affairs and possessing vision. He should be the general advisor and business manager of the community.

[1] Address delivered before the Conference on Reclamation and Land Settlement, Dec. 14, 1925.

COMMUNITY ACTIVITIES

In the early steps of organizing a community only such activities should be undertaken as are clearly shown to be necessary. The following activities represent a highly developed southern community:

Community schools.—To serve the usual purpose for the community, with special attention to agriculture, home economics, manual training, and music.

Community library.—In the school or the community building.

Community bank.—Owned and operated by the people, handling all matters of finance, and possibly conducting a building and loan association for the benefit of the community, insurance, etc.

Community warehouse.—For community use, including storage of cotton and other products and supplies, and as a community shipping and receiving point.

Community sweet potato house.—For curing, grading, and keeping sweet potatoes produced by the community.

Community hatchery.—For hatching poultry in quantity.

Community abatoir.—For slaughtering animals for community use, dressing, and packing poultry, etc.

Community creamery.—For assembling and converting dairy products produced by the community.

Community cannery.—For canning orchard and garden produce for the community in large quantities.

Community cotton gin.—To protect community-owned cotton from mixing with low grades, and to keep seeds pure for planting purposes.

Community grist mill.—To serve the community. (In connection with cotton gin.)

Community greenhouse.—For propagation of plants and shrubbery for civic beautification, and vegetable plants and fruit trees for the community.

Community seed improvement.—Land set apart for improvement of seeds of cotton, corn, etc., by selection for community use, thus making possible the use of the best varieties, and minimizing danger of mixing.

Community power plant.—To supply power and light for the various farms and for community enterprises.

THE COMMUNITY BUILDING

The next step is the selection of a convenient site for the construction of a community building and the several community enterprises. This selection would be made by the president in cooperation with the executive committee.

The community building is the hub of the community. It is the magnet to attract the people to public meetings for business or pleasure, where executive matters are handled, and where social life centers. This building should be provided with an assembly hall with stage, and beneath this might be dining room, kitchen, gymnasium, baths, etc.

The offices of the executive officers should be located in the community building.

The scope of the organized rural community is not in any way affected by school districts or townships. The automobile and good roads have, in a large measure, overcome the matter of distance. *The farmer who lives several miles out could reach his community center now that we have good highways as readily and as comfortably as the city man reaches his chamber of commerce.*

EXAMPLE OF BUSINESS AND LABOR CITED

Unfortunately, farmers as a people have never put into practice the principles of organization and cooperation employed by manufacturing and commercial industries. Were the same principles employed in our agriculture, we would easily become a very prosperous and contented people, reducing the existing burden upon producer and consumer, while at the same time automatically helping ourselves to a better and more wholesome development of mental, moral, and physical well-being.

It is strange that the Department of Agriculture and the agricultural colleges have made no serious attempt to define the meaning of "organized agriculture," nor to emphasize the necessity for its existence nor the step necessary to its establishment. In their zeal to secure information for the advancement of agriculture, they have depended entirely upon their own agencies to disseminate this information through the public press, printed matter, and to individual farmers, thus reaching at best only a small percentage of the farming class, instead of setting up the necessary machinery among the farmers themselves, where this information from the government and agricultural colleges could be received, discussed, and acted upon. A high official in the Federal Government in a recent issue of Commerce and Finance, after setting forth

certain panaceas for the agricultural ills, made the significant statement that we would have to educate the farmer, which he admitted would be a slow process, and why? Because there is no nation-wide organization of farmers through which the process of education could be greatly hastened as is done with commerce and with labor.

Business men in towns and cities through their local chambers of commerce discuss problems of government, economics, and all matters affecting their interest, and record their approval or disapproval, and forward their findings to the national chamber of commerce. Labor discusses in its local unions problems affecting its interest and submits the results to its national headquarters. In this way business and labor present a solid front to the country and influence legislation and public opinion in their behalf.

If farmers were organized through community centers they could take concerted action like business and labor and thereby could exercise even greater influence than either business or labor, for agriculture is of a more basic character and has great strength numerically.

ORGANIZATION MAKES PROGRESS POSSIBLE

Economic production and marketing are imperative to reduce costs and establish better relationship and cordiality between the producer and the consumer. An organized agricultural community is a little world somewhat to itself, but with every man, woman, and child cooperating, not only producing the best possible from the individual farms for living at home, but contributing in like manner to the nonproducer of food and feed, while living under the best rural conditions with modern facilities for comfortable living. Such a community would have its own hydro-electric plant producing power and light, home water works and bath rooms, telephones, radios, good roads, and many other things to keep the people daily and hourly in close touch with the outside world, particularly its markets.

"The standard of what we call to-day 'Civilization' is a city standard, and only through organized rural communities can we break down the differentiation between the country home and the city home, between the country woman and the city woman, between the country boy and girl and the city boy and girl." The organized rural community brings to the country home the city advantages. Nothing less will keep the intelligent, ambitious rural boys and girls in the country districts.

GIVES THE FARMER A VOICE

An organization such as has been outlined, must, as stated, be fitted to the individual community, and must have the vision and inspiration and willingness necessary to undertake and carry on to conclusion whatever task is assumed. The organization can be no bigger and better than the people who compose it.

Rural community organizations could be federated in the various counties, and representatives of county federations could perfect a State organization. With the organization of this character in each State, State and national problems could be thoroughly discussed and definitely acted upon by the individual members of the community organization. In this way each individual farmer could have a voice and play a part in determining all economical problems that affect his interest.

Government land settlement in foreign countries

Countries	Rate of interest	Time given to pay for land or for repaying loan
	Per cent	*Years*
Denmark	3 to 4	65
Italy	2.5	50
Holland	4.7	
Norway	3.5 to buy land and 4 to owners.	
Hungary	4	50
Austria	4 to 4.5	54½
Russia	4.5 principal and interest.	55½
Germany	3.5 to 4	56½
France	4 to 4.5	75
England	4	50
Ireland	3.5	68
Belgium	4.5	30
Switzerland	4.5	57
New Zealand	4	36½
Victoria, Australia	4.5	36½
New South Wales	3 to 5	30 to 40
Other Australian States.	4 to 5	30 to 40
British and German South Africa.	4	
Chile	4	33
Argentina	4	
British Columbia	1 per cent more than the interest on state bonds; 5 per cent at present.	36½

Such an ideal organization is supposed to have sprung from a small beginning gradually developing through community cooperation. A stock company, in which each farm owner would own shares seems one way of solving the financial problem and is easily understood by the average layman; another plan would be a non-stock cooperative organization of the people of the community. Money invested in such an enterprise would be constantly under the supervision of its owner and properly handled should pay dividends through the medium of better prices for things sold and proportionately low prices for things not produced at home but purchased through community agencies. Assuredly I appreciate that there are many difficulties to overcome and a stupendous task to be accomplished before the farmers can be organized.

We are just beginning to realize that our future is likely to be determined primarily by the relation of the people to the land. 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.

Two of the chief difficulties with which to contend in organizing communities are the continual growth of tenancy, throughout the land, and the distressing short tenure of tenants in occupying the land. This can be illustrated by Illinois, Indiana and South Carolina. Illinois with its 177,986 farm owners and 101,196 tenants and Indiana with its 137,210 farm owners and 65,587 tenants and South Carolina with its 67,000 farm owners and 124,000 tenants. With this condition existing we are forced to ask the question—can we hope to build up a lasting, satisfying, rural civilization under such conditions. It is interesting to note the consideration and earnest efforts of all civilized countries other than our own to encourage and aid in home ownership. We do not seem to fully realize that a prosperous, intelligent, and contented rural population is essential to our national prosperity. The world's experience has shown that the best way to secure this is to encourage a division of all lands into small farms, each owned and operated by one family. We know the world's most important school is the home with the farm; we know this philosophy to be true, so said the late Dr. Seaman A. Knapp.

I know there are economists who look upon agriculture the same way they look upon the industries. I appreciate that they advocate corporate agriculture; that they go so far as to defend tenant farming. In the last analysis they are advocating separating the farm home from the farm. To my mind they are inseparable. Unless you propose to destroy the agency that in the early history of this country had more to do with the molding of the policy upon which this democracy is founded than any other influence. I emphasize the farm home. The stabilizing influence today throughout the world is the home-owning rural farmer.

Dean Russell of Wisconsin has made this significant inquiry, "Have we ever had a profitable agriculture? Farming as an industry has not been consistently and steadily profitable. Here and there individual farmers have made money. Agricultural wealth is due more to in-

(Continued on page 28)

THE VALUE OF CAREFUL SELECTION OF SETTLERS

A personal interview with the applicant is the most effective means of determining his character, industry, experience, and capital, all of which are essential factors for success on an irrigated farm

By George C. Kreutzer, Director of Reclamation Economics

FARMING, like many other forms of business or occupation, requires skill and energy on the part of the individual to make it successful. There is no other business or occupation with which the home is so closely associated. The housewife must be a frugal manager and know how to utilize those farm products which should be produced on every farm to form a large portion of the food supply. The necessity for these requirements does not, however, deter rural minded people from making farming their life work because, after all, there are many advantages for people who know how to enjoy them. There is also a permanency about it made possible by ownership.

When a settler and his family have what might be termed rural sense, which is the enjoyment that comes from doing the many farm tasks timely and well, they have the first requisite for becoming successful. Sometimes this attribute is called experience, but it is more than that. One must have done the many menial farm jobs to really know whether satisfaction is felt upon their accomplishment, or whether they are felt to be mere drudgery.

It is the placing of individuals suited to an occupation and environment from which they will get the utmost satisfaction and benefit that is of paramount importance in any work of selection. Too often the inexperienced think they would like to own and operate a farm because of the independence it should give them, or because they have visions of picking fruit from their own trees, having fresh eggs, home-cured bacon and hams on their table. They can almost hear the splash of thick cream on their favorite breakfast food. It is true these are some of the joys of farm life, but the trees must be cultivated, sprayed, and pruned if they are to bear fruit; and the chickens, hogs and cow must be fed and cared for if we are to enjoy their products. Only those settlers should take farms who are suited to this occupation both by temperament and physical strength, and who have had some experience on farms, in the light of which their fitness for the undertaking can be more accurately determined. The experience thus gained will also save them from making costly mistakes. It has always been, and will continue to be, good advice to encourage the inexperienced man to first work for the best farmer in the district so that he may determine his own fitness for the undertaking and at the same time gain valuable experience.

Farming has become more and more a capitalistic enterprise. The average, well equipped, irrigated farm has invested in it as much capital as is invested in a small country bank. One would not expect to start in the banking business with $500 or $1,000 in assets. The farmer who purchases raw land should have enough capital to erect a cottage and barn, buy working tools and equipment, and have enough left to live on until his fields are producing sufficient income to meet operating expenses and enable him to live confortably. If he has not this capital he should know where it can be obtained.

The capital requirement will vary with the farm and the individual who undertakes to develop it. Some settlers have growing boys who can help them, thus saving the cost of labor. Others will be able to work out with teams or as skilled laborers at times of the year when their farm needs little attention. The only safe course to follow is to work out with the applicant for a farm a financial and agricultural program covering the period of development to determine what expenditures will be necessary and to estimate conservatively for the same period, the returns from crops.

Between those intrusted with the high privilege and duty of selecting settlers, and the prospective settler, himself, there should be no difficulty in arriving at the estimated cost of a house, barn, and other outbuildings, domestic water supply, fences, clearing, horses, cows, pigs, chickens, farm implements, seeds, and trees which must go into the capital investment. The operating expenses can also be estimated, such as taxes, labor, interest on borrowed money, harvesting and threshing, insurance, water charges, repairs, and living expenses. The income from crops to be grown can likewise be estimated on the basis of reasonable yields at what are known to be the usual selling prices. It is surprising how few settlers have such a program in mind when they acquire land. Although such a program may not be precisely accurate, it is, nevertheless, an excellent guide for future operations and causes the settler to allocate his

NEED OF COMMUNITY ORGANIZATION

(Continued from page 27)

creased land values than to profits actually accumulated from products of the soil. I do not believe that agriculture can ever be made as profitable as the industries for several reasons—the inability to organize the farmers, the inability to control the elements, the invasion of insects, pests and the plant diseases, continued operation of farms during times of depression. Therefore, I think we should hold out and emphasize that agriculture offers those things which can not be obtained through commerce and the industries." In the language of Dean Davenport—"I believe we are to have a new agriculture if not indeed a new civilization."

Yes, we are to have a new agriculture. Shall it be better or worse than the one our pioneer fathers wrought? That is for us to say. For what this new agriculture shall be like and what shall be the character of the civilization of which it will be a part will depend very much indeed upon the vision possessed by our leaders now and in the immediate future. It will depend also upon the degree of understanding and of cooperation which can be maintained between thinking citizens who must take the lead and our educational institutions which are the public agencies for investigating the many difficult problems continually arising in a rapidly developing civilization. The great question before us is, Shall the agriculture of this great country drift into its new development, accepting what the accidental fates deal out, or shall we by taking thought control and direct this development to some definite ends? By taking thought early and constantly the citizens can make this development almost what they will. What we shall be later on will be the result, not of revolution, but of evolution from what we now are, to what we then shall be. The future of our agriculture is in our own hands and there is no limit to what may be achieved.

limited capital judiciously, thus directing his expenditures into productive channels. The boards which are now to pass on the qualifications of settlers will, at the same time, give to the applicants a valuable service based on the best known local practices of developing and operating an irrigated farm.

The industry, character, experience, and capital which settlers possess all are factors entering into their success as farmers. If a settler lacks even one of these essentials he is almost foredoomed to failure. Often local communities point out that certain of their farmer citizens had no capital when they came. They can also show those who had neither capital nor experience and still made a success of farming. One such case was a young foreigner who was employed on a dragline machine at $6 a day and who then worked an additional eight hours a day developing his farm. It is now a going concern. He was not an average good settler; he was a superman. The average person has not the physical strength or endurance to do in one day what is normally accomplished in two days.

That kind can be pointed to with pride in every farming community, but there was still a greater number whose meager qualifications caused their failure and who left behind them tar paper shacks and brush barns as mute monuments of years of deprivation and unsuccessful toil, under a plan providing for the selection of all of which could have been averted settlers.

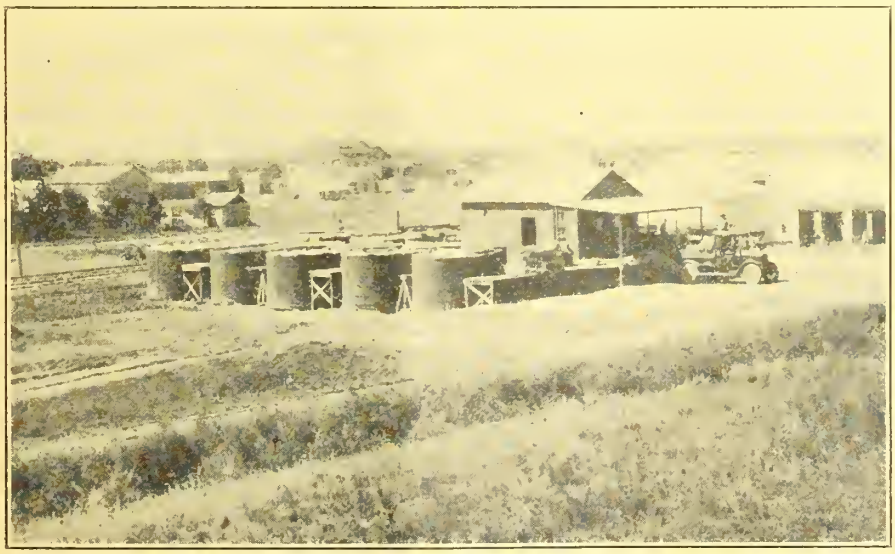
The reclamation law as now amended by subsection C, section 4 of the act of December 5, 1924, provides for the selection of settlers in accordance with certain desirable qualifications. Local boards have been appointed to act on a number of the projects to carry this new policy into effect.

Wheat in shock on the Carlsbad project, New Mexico

These boards are composed of men of broad practical experience in the problems surrounding irrigation farming. They should be effective because the matter of selecting settlers is more a practical problem than a technical one. They will be of most value if they will sit in with the applicants and with pencil and paper determine just how each applicant can best spend his capital to develop the farm under consideration. This leads to a thorough discussion of the financial problem in each case, to the end that the board will know if the applicant has a good chance of succeeding; and, on the other hand, the applicant will have a full appreciation of what confronts him. It is no more or less than reaching a common conclusion of what is needed to develop a farm and how best to accomplish it.

A personal interview with the applicant is the most effective means of determining his character, industry, experience, and capital. Correspondence with bankers or other references the applicant may give will enlighten the boards in this respect. Bankers consider these human characteristics and know the value of them when making loans, and somewhat similar practice will prove of great value to the boards.

An applicant for a farm should be encouraged to bring his wife, if he has one, to inspect the farm and confer with the board, as her contentment and happiness in the new undertaking will have much to do with the applicant's ultimate success. These boards will have an opportunity to be of great assistance to the new settlers who are to come, and also they can prevent, to a large extent, duplication of some of the unfortunate experiences of the past.



Pickle salting station in Nisland, Belle Fourche project, South Dakota. Cucumbers yielded returns on this project in 1925 as high as $400 per acre.

At the end of December the Guernsey Dam, North Platte project, was 32 per cent completed.

A recent fire at the Spanish Fork sugar factory, Strawberry Valley project, destroyed the sugar warehouse containing 123,000 100-pound sacks of sugar, seriously damaging the contents.

ECONOMIC REPORT ON AN IRRIGATION PROJECT

The compilation of a report on the economic feasibility of a proposed project will be helped materially by following a diagrammatic outline of factors to be considered—Such an outline is suggested here

By Oro McDermith, consulting engineer, Kittitas irrigation district, Washington

IT is obvious that the economic success of an irrigation project depends on the success of the average individual farmer or settler who secures the benefits from the construction of the irrigation system. The economic success of the individual farmer in turn depends on whether he makes a profit by his operations. That is, the average annual gross income over a reasonable period of years must exceed the average gross expenditures necessary in carrying on such operations.

In making an estimate of the feasibility or probable opportunity it is necessary to consider items of gross income and cost of operations in the average individual case in considerable detail. The more detailed the estimate usually the less chance of error will be encountered. In the making of such an estimate it is very convenient to have the outline in diagrammatic form, working from the result desired down through the various component items which produce such result and having each item capable of being further subdivided to its furthest detail.

The amount of the "Annual gross income" will depend primarily on the volume of production and the prices secured. Estimates of crop prices, costs and conditions should be based on data obtained from similar enterprises as to past performance and corrected for local conditions and possible future influences. Such estimates should be made with clear judgment and consideration of future conditions. For instance, on the Kittitas division of the Yakima project the primary established crops are alfalfa and grain, which, combined with dairying, offer a firm foundation for an estimate of the character of crops which probably will be grown with the added water supply. Yet there are areas on this division which, on account of air, drainage, location, and soils, undoubtedly will be devoted to commercial orchards and other high-priced crops if future prices for these crops justify the investment. Influences of this character should be carefully considered in the economic estimate.

As the income from farm operations becomes available to the farmer largely at the end of the crop season we should consider first the detail of "The annual cost of operations" and following this, "The annual gross income."

Cost of land and water supply.—The primary investment of a settler on an irrigated farm unit is in the land and the water supply necessary to irrigate such land. Ususally the largest investment is in the water supply. This investment may be made all in one year or, as is usually the case, may be extended over a long period of years. Numerous methods of financing such investment are employed and the method proposed should be carefully analyzed in order to determine its effect on the annual cost for the period covered by the economic estimate.

The cost of the land should include the initial outlay for raw, unculivated land plus the expense necessary to put such and into condition for the production of crops.

The raw land value is for the land in its natural state and consists principally in the value for grazing purposes. This should in most cases be but a nominal figure. After the land is smoothed for the first seed bed it is considered that subsequent operations will be included under the subdivision "Cost of producing crops."

The items under the "Cost of land," are capable of further subdivisions according to character and other conditions. For instance, the item of "Clearing" generally depends on the character of work to be performed and can be subdivided as shown in the diagram. Each of these items is capable of further subdivision if required.

The "Cost of water supply" is an added investment to the "Cost of land" to make the combination productive by the labor of the farmer. It should include all costs which are for the purpose of insuring the permanency of the water supply.

Each of these items is likewise capable of extension as in the item of "Preliminary cost" as applied to irrigation districts which should include the expense necessary to bring the project to the point of construction of the irrigation system. This is an investment to make the land more valuable.

The item "Water purchase cost" in the diagram would be the purchase price of a given quantity of water. The item "Other water rights" includes supplemental supplies of some value owned or acquired in addition to but separate from the main supply.

Cost of improvements.—The cost of improvements should include all expenditures of the capital investment which increase the value of the farm and make it more habitable.

Further subdivision of the item "Cost of buildings" is obvious.

For convenience the "Cost of general improvements" may be further subdivided, as indicated.

Cost of equipment.—The cost of equipment includes the yearly amount expended for tools, harness, and other items necessary to enable the farmer to carry on his operations efficiently. The grouping of these items is made thus on account of the common factor of relatively large depreciation.

Cost of livestock.—The yearly cost of livestock will vary greatly. As a general proposition most of the livestock will be raised on the farm, the offspring of progenitors purchased during the first few years of operation. Other cases may occur where the purchase of livestock is relatively large each year, especially where stock is bought annually for the purpose of feeding and fattening. Further subdivision of this item is obvious.

Cost of producing crops.—The cost of producing crops is one of the largest items of the annual cost on the irrigated farm. There are many methods for estimating this cost, depending on the grouping of the component factors. The further subdivision shown is illustrative of but one combination. The items as shown in the diagram consist of the prineipal operations and are capable of much more detailed subdivision.

Other current operation costs.—Under this heading will be feed purchased for stock, insurance on crops and livestock, water, operation and maintenance charges, and miscellaneous (itemized).

Personal expense.—In the farming business unlike other business enterprises the home and living expenses are considered as an integral part of the operations. These may be subdivided as indicated.

Fixed charges.—Under fixed charges we include: Insurance on buildings, interest charges, amortization, and general and personal taxes.

Miscellaneous.—Under this heading place any item which can not be placed under the above subdivisions. Any item under this heading should be accompanied with an explanation.

Annual gross income includes all receipts or values which may be received on account of any farm operation, and may be subdivided as indicated.

The completed diagram summarizes the subdivisions clearly so as to avoid duplication and the omission of important items.

Economic report of an irrigation project

Annual cost of operations

- 1. Land and water supply
  - A. Land
    - Raw land value.
    - Clearing land
      - Sagebrush.
      - Willows and cottonwoods.
      - Cut-over lands.
      - Forest underbrush.
      - Timber.
    - Levcling.
    - Plowing.
    - Smoothing.
  - B. Water supply
    - Preliminary cost
      - Investigation.
      - Organization.
      - Promotion.
    - Water purchase.
    - Cost of irrigation works.
    - Other water rights.
- 2. Improvements
  - A. Buildings
    - Dwelling.
    - Barn.
    - Silo.
    - Miscellaneous buildings.
  - B. General improvements
    - Fences and gates.
    - Irrigation system.
    - Domestic water supply.
    - Sewage disposal.
    - Roads and walks.
    - Shade trees and shrubbery.
    - Depreciation.
- 3. Equipment
  - A. Hauling equipment
    - Automobiles.
    - Trucks.
    - Wagons.
    - Harness.
    - Hayrack.
  - B. Farming equipment
    - Tractors.
    - Plows
      - Walking.
      - Sulky.
      - Ditching.
      - Two-way.
      - Gang.
    - Harrows.
    - Mowers.
    - Rakes.
    - Drill.
    - Stacker.
    - Binder.
    - Manure spreader.
    - Corrugator.
    - Cultivator.
    - Potato planter.
    - Potato digger.
    - Other farming equipment.
  - C. Special equipment
    - Scrapers
      - Fresno.
      - Slip.
      - Buck.
      - Mormon.
    - Small tools, etc.
    - Blacksmitb tools.
    - Dairy equipment.
    - Poultry equipment.
    - Apiary equipment.
    - Spraying equipment.
  - D. Other machinery
    - Baling machinery.
    - Threshing machinery.
    - Winnowing machinery.
    - Cleaning machinery.
    - Miscellaneous.
  - E. Depreciation.
- 4. Livestock
  - Horses.
  - Cattle.
  - Hogs.
  - Sheep.
  - Poultry.
  - Bees.
  - Other livestock.
  - Depreciation.
- 5. Crop production
  - Seeds and seeding.
  - Irrigation.
  - Spraying.
  - Cultivation.
  - Thinning.
  - Fertilizing.
  - Harvesting.
  - Packing.
  - Marketing.
  - Miscellaneous.
- 6. Other current operation costs.
  - Feed for stock.
  - Insurance on crops and livestock.
  - Water, operation and maintenance charges.
  - Repairs and blacksmith.
  - Veterinary.
  - Miscellaneous.
- 7. Personal expenses
  - Household expenses and living.
  - Life insurance.
  - Medical and dental.
  - Recreation, church, etc.
  - Furniture.
  - Household equipment.
  - Miscellaneous.
  - Depreciation.

Annual cost of operations—Continued

- 8. Fixed charges
  - Insurance on buildings.
  - Interest charge.
  - Amortization.
  - General and personal taxes.
  - Construction charge.
  - Other fixed charges.
- 9. Miscellaneous
  - Contingencies.
  - Incidentals.

Total cost of operations ---------- $----------

GROSS ANNUAL INCOME

- 1. Crop sales
  - Orchard products.
  - Grains and cercals.
  - Hay.
  - Pasture.
  - Cultivated crops.
  - Garden products.
  - Small fruits.
  - Miscellaneous.
- 2. Livestock sales
  - Horses.
  - Cattle.
  - Hogs.
  - Sheep.
  - Miscellaneous.
- 3. Dairy products
  - Whole milk.
  - Cream.
  - Skim milk.
  - Other products.
- 4. Poultry sales
  - Poultry.
  - Live birds.
  - Eggs.
  - Miscellaneous.
- 5. Miscellaneous
  - Apiary products
  - Other products.
- 6. Other income
  - Land sales.
  - Land rents.
  - Miscellaneous.

Total gross income ---------- $----------
Deduct cost of operations ---------- ----------

Net income ---------- ----------

CONTRACT SIGNED FOR KITTITAS CONSTRUCTION

Signing of the contract with the State of Washington for the development and settlement of the Kittitas division of the Yakima project, and with the Kittitas Reclamation District for the construction of a diversion dam and lateral system to supply water to approximately 70,000 acres of land, at a maximum cost of $9,000,000, by the Secretary of the Interior on December 19, released an appropriation of $375,000 for the beginning of construction on the Kittitas division.

Preparatory work is being expedited. Local representatives of the bureau have been authorized to secure the necessary rights of way for canals, laterals, and other irrigation works. Other agreements being negotiated are purchases of flowage rights above the proposed diversion dam and contracts for building irrigation structures across the tracks of the Northern Pacific Railroad.

Estimates show that more than $100,000,000 worth of corn stover and straws are burned, plowed under, allowed to rot in stacks, or in other ways wasted in the United States, annually.

TIETON DAM CONSTRUCTION, YAKIMA PROJECT, WASH.

This great earth, gravel, and rock fill embankment, which was dedicated in July, 1925, by the Secretary of the Interior, furnishes a stable water supply for 70,000 acres in the Yakima Basin

By Willis C. Christopher, assistant engineer

THE Tieton dam, part of the storage system for the Yakima irrigation project, is located on the Tieton River about 30 miles west of Yakima, Wash., and a few miles from the summit of the Cascade Range. It is in the Rainier National Forest and has a picturesque and scenic setting. Climbing the near-by hills, which with the dam will form the Tieton Reservoir, one may glimpse Mount Rainier, Mount Adams, and other lofty peaks of lesser renown.

The reservoir, with its capacity of 202,500 acre-feet, will be supported by a drainage area of 187 square miles of well-timbered mountainous country. The storage will furnish a stable water supply for 70,000 acres of land of high productivity in the Yakima Basin.

The Tieton dam is an earth, gravel, and rock fill embankment with a concrete core wall extending from bedrock to crest and anchored in solid rock on both abutments. The height from the deepest core wall foundation to crest is 321 feet. The total yardage in the embankment is 1,995,000 cubic yards, of which 1,570,000 cubic yards are earth and gravel and the remainder rock. The length of the dam along the crest is 905 feet and the thickness from toe to toe is 1,110 feet. The total quantity of concrete in the various parts of the structure is 43,600 cubic yards.

THE EMBANKMENT

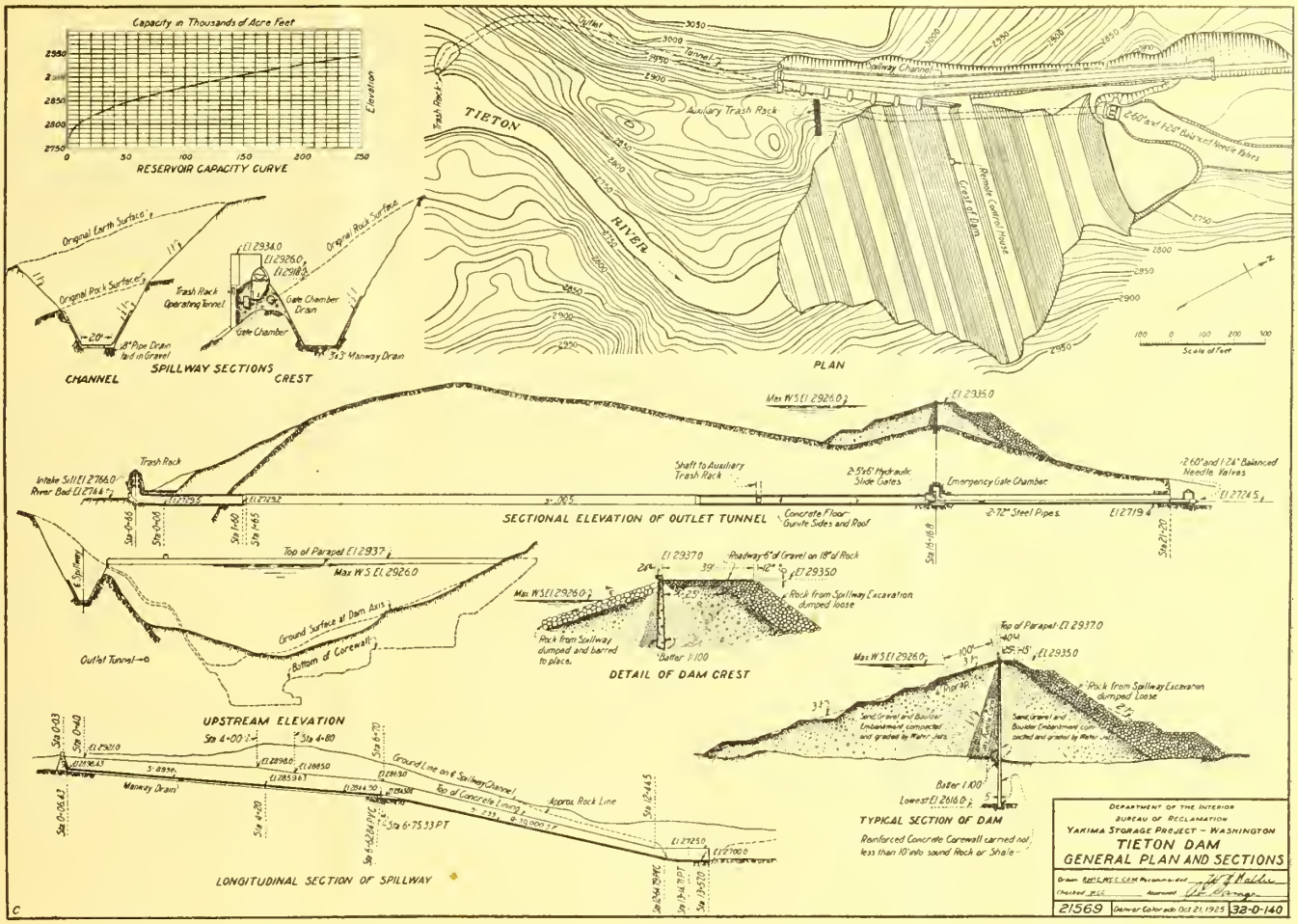
The main body of the embankment is of the semihydraulic fill type. Suitable material consisting of earth, gravel, and bowlders was excavated by steam and electric shovels from borrow pits, loaded on dump cars, hauled to trestles located on the upper embankment slope, and dumped. Streams of water from hydraulic giants developing about 85 pounds nozzle pressure were then directed upon the dumped material. This sluicing tended to separate the smaller rocks, sand, and clay and carry them away from the dump toward the core wall, leaving the coarsest rocks on the outer slope well compacted and with the voids filled with smaller rock and gravel. The suspended material in the water was gradually deposited on a gently sloping beach extending from the dump to the core pool, in the central part of the dam, upstream from the core wall. The width of this pool was maintained slightly greater than one-third of the distance down from the top of the dam. By the time the sluicing water reached the pool it held in suspension only the finest sand and clay. The fine sand was deposited at the outer edge of the pool and the clay toward the core wall. Thus was built up a tapering puddle core of impermeable material in front of the concrete core wall, with a thickness equal to one-third of the height from the top of the dam. The height of the water in the pool was regulated through conduits in the west abutment which were connected with the diversion tunnel. In building the part of the fill below the core wall the material was dumped and washed in the same way, but no pool was maintained against the core wall. The clay was thus carried off in the water leaving a deposit of sand against the core wall grading through gravel and rock to coarse gravel on the outer slope. This left a heavy, compact freely-draining fill on the downstream side. Clean rock excavated from the tunnel and spillway was used in building up the rock fill part of the embankment.

THE FOUNDATION

In testing foundation conditions at the dam site several shafts were driven to bed rock along the line of the core wall. These showed an overburden of from 20 to 90 feet of earth on the rock with an average of about 60 feet. It was decided to excavate the cut-off trench through this overburden by mining methods rather than by open cut. Therefore the test shafts were rigged as working shafts with frames, cages, and hoists. At the bottoms of the shafts drifts were started in either or both directions along the line of the core wall, the material being mucked into cars on the skips. As soon as the drifts were opened up regular mine timber sets were put up and a track laid. Thereafter the cars were pushed to the heading, filled with muck, pushed to the cages, hauled to the top, and dumped. Side and top lagging were used wherever necessary. When the bottom drift was sufficiently far into bedrock the top lagging was taken out at some convenient point and enough material picked or barred down into waiting cars so that a set of timbers could be placed. Then this drift was extended in either or both directions. Successive drifts were opened up in a similar manner and the material trapped in cars below. Considerable water was encountered in the lower workings, so it was necessary to backfill with concrete as soon as possible. The concrete was mixed outside, dumped into cars, lowered, and taken out on some drift from which it could be conveniently dumped to fill the lower drifts. All drifts penetrated bed rock until sound rock was encountered with a minimum allowable penetration of 10 feet. Underground concrete was plain but the concrete above ground was reinforced. The thickness of the core wall varied from 1 foot to 5 feet, both faces having a batter of 1:100. The thickness of underground concrete was 5 feet. Wooden forms were used for the wall, the panels being tied together with ½-inch steel rods. The concrete was deposited in the forms in 5 feet 8 inch lifts by means of cableway buckets of 2 cubic yards capacity. A concrete mixture of 1:2½:5 was used throughout the core wall. Two 4-foot diameter shafts were built on the downstream side of the core wall to facilitate future inspection of the wall and puddle core. The completed wall contains 23,400 cubic yards of concrete.

THE SPILLWAY

The spillway consists of a side-overflow concrete crest nearly at a right angle with the dam and a concrete-lined channel extending to a point well below the dam. Both crest and channel are constructed in the solid rock which forms the west abutment for the dam. The spillway crest is divided into six bays-each fitted with a 65-foot by 8-foot drum gate of the Arrowrock type. The total overflow length is 390 feet. With the gates down the discharge capacity is 30,000 second-feet with an 11-foot freeboard on the dam. A reduction of this freeboard to 7 feet will increase the spillway discharge to 50,000 second-feet. The maximum recorded flood discharge of the Tieton River at this point is about 10,000 second-feet. The spillway gates weigh about 45 tons each. Each is controlled independently of the others and each one may be operated by hand. The two gates nearest the dam are provided with automatic siphonic controls. The crest foundation has been thoroughly grouted to prevent uplift. Holes for grouting were driven by both air drills and diamond drills. The total concrete placed in the spillway amounted to 15,800 cubic yards.



TUNNEL AND OUTLET WORKS

A tunnel 22 feet wide and 19¼ feet high was the first feature completed. Upon the building of a cofferdam the entire flow of the river was diverted through this tunnel during the placing of the embankment. The outlet control works were later installed in this tunnel. Two hydraulically operated 5-foot by 6-foot slide gates were installed in the tunnel on the center line of the core wall. These gates are provided with two independent sets of controls, one in a chamber immediately above the gates and another on the top of the dam. From these gates two 72-inch electric-welded steel pipes lead to two 60-inch balanced needle valves and one 24-inch balanced needle valve in a house at the mouth of the tunnel. These valves have a combined discharge capacity of 1,700 second-feet and will be used to control the flow for the irrigation demand. A vertical trash rack is provided at the upper end of the tunnel and an auxiliary trash rack with an independent intake leading through a shaft to the tunnel is provided just below the spillway crest. The upper 220 feet of the tunnel is lined, as is also the 500 feet immediately above the emergency gates. The tunnel and outlet works contain 4,150 cubic yards of concrete.

An excellent camp was maintained, well built, sanitary, and with an excellent supply of mountain water. The maximum number of men employed at any one time was 570. A 1,000-kilowatt hydroelectric plant furnished light and power for the job and the camp. The principal plants operated by electricity were the compressor, electric shovel, sluicing plants, cableways, gravel plant, and to a large extent the mess. The hauling of supplies and equipment from the nearest railroad station, 26 miles distant, was done by trucks under contract.

The cost of Tieton Dam is $4,373,600, which is $240,000 less than the estimated cost in 1921. Had the quantities remained the same as those used in the original estimate, a saving of more than $400,000 would have been effected. In order to keep the spillway channel in solid rock, a change of line was necessary, which increased the excavation for that feature approximately 90 per cent.

The principal unit costs are: Tunnel excavation, class 3, $7.02 per cubic yard; spillway excavation, class 2, 56 cents per cubic yard; spillway excavation, class 3, $1.68 per cubic yard; embankment, earth, 54 cents per cubic yard; embankment, rock, 73 cents per cubic yard; concrete, plain, $12.60 per cubic yard; concrete, reinforced, $17.39 per cubic yard; spillway lining, $21 per cubic yard.

WOMEN VOLUNTEERS WANTED FOR ERA

The Secretary or some other officer of each and every organization of women on our projects is requested to take her pen or typewriter in hand and write to Miss M. A. Schnurr, secretary of the Commissioner of Reclamation, and associate editor of the NEW RECLAMATION ERA, *and outline her views as to how the* ERA *may best serve the interests of our project women. The same invitation is extended to every woman not connected with a women's organization.*

The ERA *wishes to be of service to every one on the projects—men, women, boys, and girls. Just now the call is for women volunteers; without whose cooperation this proposed feature of the* ERA *can not be a complete success.*

Write to-day!

CLOSER SETTLEMENT IN AUSTRALIA

ONE of the earliest of the irrigated closer settlements established in Victoria, Australia, was located at Bamawm when Dr. Elwood Mead, now Commissioner of the Bureau of Reclamation, was chairman of the State Rivers and Water Supply Commission of Victoria.

The land for this closer settlement was purchased at prices ranging from $35 to $50 an acre. Settlers were required to have not less than $1,500 capital and satisfactory farming experience. The land was sold to these settlers on 31½ years' time, with interest at 4½ per cent, and they were given advances for help in its development up to $2,500, to be repaid in 20 years with interest at 5 per cent.

The settlement was started in 1910. In the 1925 report of the State Rivers and Water Supply Commission of Victoria, there is a review of its progress. It is printed in the ERA as showing the operation of aided and directed settlement in other countries.

"The development of irrigation in all parts of the world is one of slow but sure growth, and, although in some countries there has been some slight retrogression on account of the postwar slump in markets for agricultural produce, it is gratifying to note that in this country irrigation development has continued to make satisfactory progress.

"A striking example of this is noticeable in the Bamawm Closer Settlement Estate in the Rochester district. This estate, which comprises an area of 13,400 acres, was, prior to its purchase for closer settlement under irrigation, used for cereal growing and sheep raising; and, although considered closely settled under dry-farming conditions, supported only 21 families. In 1910 this Bamawm area was purchased by the Government and in 1912 subdivided into 180 blocks of an average area of 70 acres. The size of the individual holdings varies with the quality of the soil and ranges from a few acres for workmen's holdings to 200 acres for mixed farming, where the soil is not of the best quality. Almost immediately after settlement, and before the settlers had time to establish themselves, they had to face the dry visitation of 1914–15, which caused them heavy losses. The period 1915–1919 had then to be spent by the settlers in consolidating their position by effecting improvements and raising the quality of their herds. During this period it was necessary for the commission to assist the settlers by advances while at the same time, the arrears of instalments due increased, reaching a maximum of $125,000 in 1919. As a set-off, however, the settlers' improvements during this period increased from $213,210 in 1916 to $358,000 in 1919, and since then there has been a steady decrease in the amount owing, while further improvements have been made, making a total value of permanent improvements of $702,060. In addition the settlers' stock and implements bring the total value of their assets to over $1,375,000. The value of the land has likewise increased by at least a further amount of $500,000. Thus to-day the settlement is in a very satisfactory condition as the subjoined figures show.

"The stages in the progress made by the district from 1910, when it was used mainly for cereal growing and supported 21 families and now when it supports 176 families are shown by taking the progress at two different periods, 1916 and 1925, thus:

	1916	1925
Land—Purchase money due by settlers	$637,500	$529,800
Advances—Repayments due by settlers	$147,500	$87,840
Value of improvements, stock, and implements	$363,790	$1,375,000
Population	501	1,182
Citrus groves—acres	396	816
Deciduous orchards—acres	376	624
Lucerne, cereal, and fodder crops—acres	6,757	11,020
Cattle	769	2,073
Horses	550	670
Sheep	3,274	6,950
Pigs	1,542	8,982
Poultry	3,167	24,000

"It will thus be seen that, during the past 10 years, there has been a most marked increase in the value of assets with a corresponding decrease in amounts owing, and this improvement should be even more pronounced from this on, as settlers begin to get the full benefit of developed orchards and increasing number of stock."

ITALIAN RECLAMATION MAY PROVE INFEASIBLE

A recent press dispatch states that land reclamation work, with which Italy has given employment to hundreds of war vetcrans, is beginning to approach completion. In all, 80,000 acres have been set aside for this purpose, some of the land being the gift of the King to the men who should accomplish its reclamation. More than $3,000,000 has been granted for the work. Hitherto some of the districts have been malarious and virtually uninhabitable.

Although Italy has vast tracts of such lands which are not only useless but positively dangerous to health, it is still disputed whethcr it is economically feasible to reclaim them. In other words, it is believed by some that the produce of the reclaimed lands will not be sufficient to pay off the amounts of money expended on them.

EDUCATIONAL MEETING OF GREAT IMPORTANCE

The most important educational gathering of the year will be held in Washington, D. C., February 22 to 25, under the auspices of the department of superintendence of the National Educational Association. An educational exhibit, in which the Bureau of Reclamation will be represented, will be placed in the Interior Department Building. One or two sections of the department of superintendence will hold their meetings in the Interior auditorium. About 15,000 delegates from all sections of the country are expected to attend the conference.

A large number of sheep are being fed in Boise Valley. The large corn crop created an active demand for hogs and cattle to fatten.

FARM OUTLOOK REPORT FOR 1926 NOW READY

The fourth annual report on the economic outlook for leading crops and livestock produced in the United States will be issued by the Department of Agriculture on February 8.

This report is intended to help farmers plan crop and livestock production to meet probable consumptive demands in the United States and abroad. It deals with the outlook for cotton, bread grains, corn and other feed crops, livestock production, and commodities such as tobacco, flax, white potatoes, sweet potatoes, and other leading fruits and vegetables. The report includes also a review of the agricultural credit situation, and outlines the situation relative to major expenses of agricultural production.

ORGANIZATION ACTIVITIES AND PROJECT VISITORS

R. F. WALTER, chief engineer, and George C. Kreutzer, director of reclamation economics, spent several weeks in the Washington office in connection with administrative policies and proposed legislation, returning to Denver about the middle of January. Mr. Kreutzer stopped off on the North Platte project on his return.

Hugh W. Colton, land appraisal and statistical clerk, was appointed recently in the Washington office and assigned to the division or settlement and economic operations.

Senator Means, of Colorado, was a recent visitor on the Grand Valley project, where he inspected the project lands and conferred with the directors of the water users' association.

E. U. Combs, general field manager of the Sacramento Valley Cotton Gin Co. was on the Orland project recently in connection with the experimental growth of cotton on the poject.

George S. Moore, clerk and fiscal agent on the Milk River project, has resigned, effective December 31.

Headquarters for the Spanish Springs division of the Newlands project have been established at Fernley, Nev., under the direction of Engineer A. W. Walker. Junior Engineer L. F. Canterbury and Chief of Field Party J. C. Coniff, who had previously been employed on the Newlands project, have been assigned to the new work.

Superintendent Richardson, of the Newlands project, and District Counsel Coffey conferred recently with United States Attorney Springmeyer in Reno on the Carson River water-right adjudication suit, and left Fallon in company with Mr. Springmeyer on January 17 for a conference with the Attorney General in Washington on the suit.

George H. Harris, former superintendent of the King Hill project, left the project on January 1 for Phoenix, Ariz., by auto, after turning over to the King Hill irrigation district the operation and maintenance of the project.

CONSERVATION

It is the policy of the Interior Department to encourage and even urge the impounding of the water on the upper reaches of all streams in the arid and semiarid regions of the United States. The precipitation of moisture in any region is fixed within approximate limits and can not be increased. Water must be used more than once to secure the greatest benefit from a given supply.

The results of scientific metcorological observations and stream measments demonstrate beyond argument that except for consumptive use in plant growth and by evaporation, no water is lost when used for irrigation and power development, but it later returns to the stream and may be repeatedly used before the final return flow reaches the stream at its outlet, but water first applied far down the stream is forever lost to use above the point of diversion. High diversions automatically simplify administration of water rights, which in the past have led to so many dissensions between neighbors, court-adjudication of rights, and litigations between States; interminable, costly, and delaying development of the West.

If diverted first to the lower areas in the watershed its reuse will be curtailed and often lost forever for beneficial purposes. Irrigation in the upper reaches of a stream acts as ground storage, equates the seasonal run-off of the stream below, and can be again and again diverted or stored for irrigation or power purposes as far down as opportunities exist.

The department would urge all interests in the upper reaches of such streams to take advantage of topographic conditions, secure their rights, and make early appropriations for storage and diversion for irrigation or power development; to profit by the opportunities of the pioneer in time and place for their own advantage and ultimate benefit to those on the stream below them. While there is no Federal embargo on the use of streams in reclamation, the absence of agreements between States interested operates as an economic embargo and prevents the preparation of adequate plans for development.

C. C. Elder, assistant engineer, who has been at Fort Sumner, N. Mex., for the past six months engaged on the Pecos River secondary investigations, returned recently to the Denver office.

Andrew Weiss, assistant director of reclamation economics, has returned to the Denver office after an extended field trip which was devoted to soil and economic surveys on the secondary Umatilla Rapids and Okanogan-Methow projects.

B. E. Hayden, industrial agent, has returned to the Denver office after completing an appraisal and land classification of the Vale project and the major portion of the work on the Owyhee project.

Julian Hinds, assistant designing engineer, and William M. Green, engineer, recently visited the site of the proposed Hyrum Dam near Logan, Utah, and discussed plans for foundation explorations for which funds have been provided by private interests in the Cache Valley.

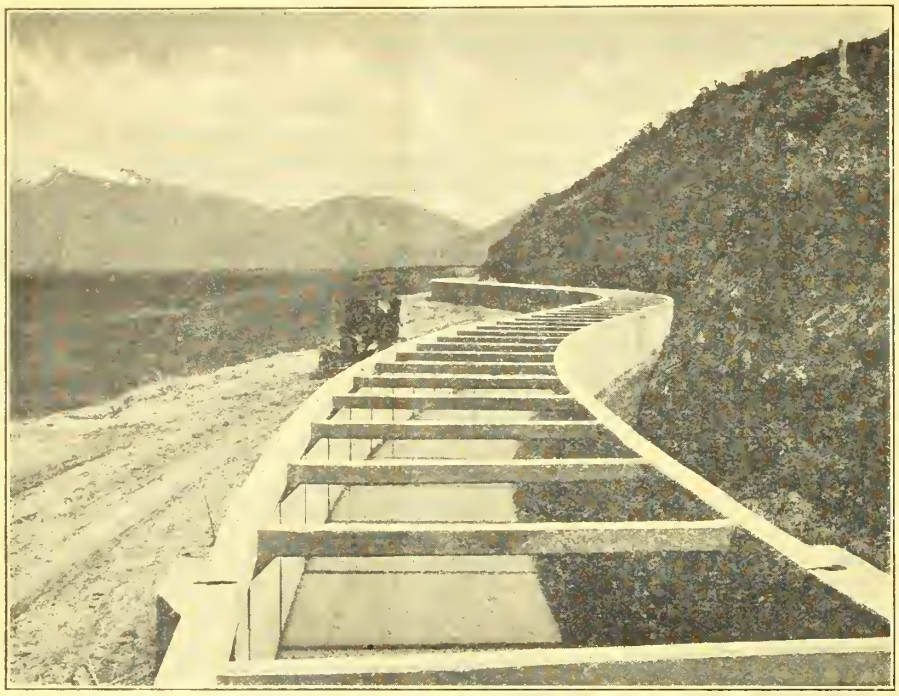
Prof. Maynard, authority on sheep feeding from the Colorado School of Agriculture; L. M. Paxton, traffic manager of the Union Stock Yards at Denver; and Mr. Mahon, of the Denver & Rio Grande Railroad, visited the Uncompahgre project recently, at which time a lamb-feeding tour was conducted under the direction of the county agents of Delta and Montrose Counties.

The clerical force on the Rio Grande project has been reduced by the resignation of Mrs. R. A. Moore, clerk. The duties formerly performed by Mrs. Moore are being handled temporarily by Junior Clerk Helen L. Fahrencamp.

T. R. Smith, junior engineer, has been transferred from the Klamath project to American Falls.

H. C. Melaas, former fiscal agent on the Klamath project, has left the Government service to accept a position as purchasing agent for the Ewauna Box Co. of Klamath Falls. J. C. Avery has been designated as fiscal agent.

R. S. Hopkins, former instrumentman on the Klamath project, has left to accept a position as secretary-manager of the Langell Valley irrigation district



High Line Canal on the Strawberry Valley project, Utah

FARM ECONOMIC ASSOCIATION MEETS

The sixteenth annual meeting of the American Farm Economic Association, held in New York City on December 28–30, 1925, was characterized by the usual full attendance and by the merit and quality of material discussed.

The interest in land and agricultural economics evidenced by this meeting of men from distant places and by speaking, writing, and discussion is the outward and visible sign of an inward determination, of which examples are coming every day to hand, to survey agriculture, and if it is found to be suffering from an illness, then to prescribe an adequate remedy.

Several participants expressed the opinion that land and agricultural economics neither would nor could have been treated with equal knowledge nor from such diverse angles at any previous time.

This confidence in the sincerity and ability of economists is an abundant assurance that we will soon stand in respect to knowledge of land and agricultural economics upon an equal footing with any country.

We wish the American Farm Economics Association its full measure of usefulness and success.

Early lambs from the Belle Fourche project have all been marketed, and prices at Omaha were about $15 per hundredweight.

COTTON CULTURE IN SALT RIVER VALLEY

Culture of Pima and Upland cotton in Arizona is the subject of Farmers' Bulletin No. 1432, the object of which is to describe cultural methods which have proved successful in the Salt River Valley and adjacent districts, including the preparation of the land, planting, irrigation, and cultivation of the crop.

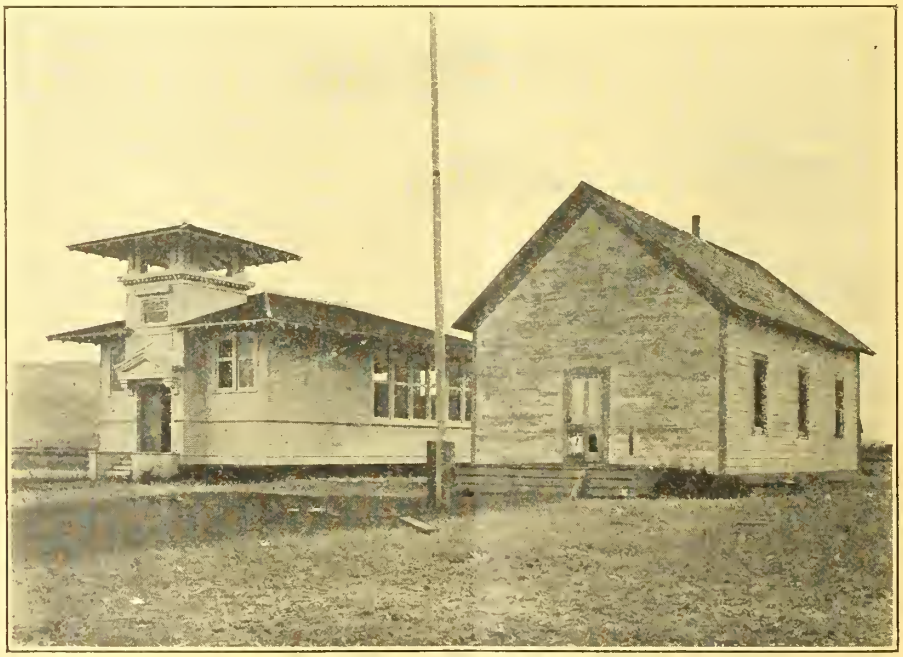
SUGAR-BEET PRICE IS GOOD NEWS TO GROWERS

The recent announcement by the Great Western Sugar Co. of a minimum contract price of $8.50 per ton for the 1926 beet crop is of great importance and significance to the Huntley project and all beet-growing communities. Under the prevailing prices the farmer on the Huntley project would not have grown beets in 1926, because, with the exception of the very best land, they could not realize expenses. Beets are a fundamental crop in irrigated districts in this part of Montana, and if it became impossible to grow them, it apparently would have meant more difficulties for the farmers on the Huntley project. The announcement should mean a prosperous season in 1926.

PUBLIC LAND SALES AID RECLAMATION FUND

The reclamation fund was increased $180,217.32 through receipts from the sale of public lands, including fees and commissions covering the third quarter of 1925. A list of the States with proceeds from the sale of public lands credited to the reclamation fund follows:

Arizona	$6,430.67	North Dakota	$531.50
California	16,915.01	Oklahoma	286.81
Colorado	15,350.15	Oregon	7,531.48
Idaho	10,649.96	South Dakota	2,660.71
Montana	17,831.45	Utah	47,157.26
Nebraska	590.09	Washington	23,113.75
Nevada	3,337.09	Wyoming	18,161.41
New Mexico	9,669.98		



The evolution of the school house on an irrigated project

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. 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 — P. W. Dent, Assistant to the Commissioner — C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — 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; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; J. R. Ummel, Chief Clerk; Harry Caden, Fiscal Agent.

George C. Kreutzer, Director of Reclamation Economics; Andrew Weiss, Assistant Director of Reclamation Economics; B. E. Hayden, Industrial 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	Brooks Fullerton	Mitchell, Nebr.
Boise	Boise, Idaho	J. B. Bond	E. R. Mills	C. F. Weinkauf	B. E. Stoutemyer	Boise, Idaho.
Carlsbad	Carlsbad, N. Mex	L. E. Foster	V. L. Minter	V. L. Minter	Ottamar Hamele	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	A. R. McGinness	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill [1]	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	G. E. Stratton	E. E. Chabot		do	Do.
Minidoka	Burley, Idaho	E. B Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Boise, Idaho.
Newlands	Fallon, Nev	J. F. Richardson	G. B. Snow	Miss E.M. Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte	Mitchell, Nebr	H. W. Bashore	L. H. Mong	T. R. Pael	Brooks Fullerton	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	H. L. Holgate	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	V. E. Hubbell	Brooks Fullerton	Mitchell, Nebr.
Salt River [2]	Phoenix, Ariz	C. C. Cragin [3]				
Shoshone	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley	Provo, Utah	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg	H. M. Schilling	C. M. Voyen	C. M. Voyen	H. L. Holgate	Portland, Oreg.
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Williston	Williston, N. Dak	W. S. Arthur	W. S. Arthur		E. E. Roddis	Billings, Mont.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	H. L. Holgate	Portland, Oreg
Yuma	Yuma, Ariz	P. J. Preston	M. J. Gorman	E. M. Philebaum	R. J. Coffey	Berkeley, Calif.

Large Construction Work

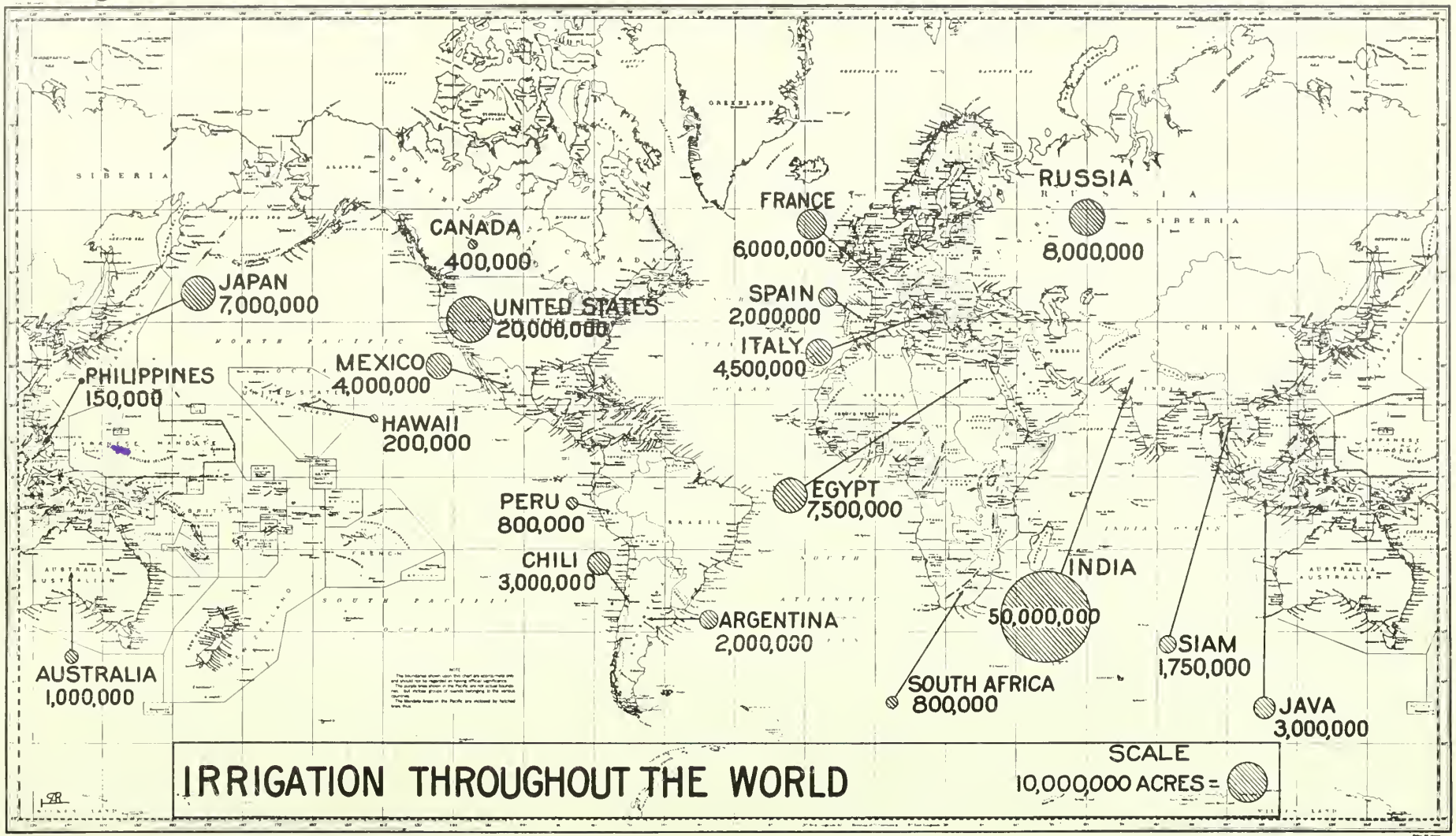
Minidoka, American Falls Dam.	American Falls, Idaho.	F. A. Banks [4]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Boise, Idaho.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F Smith [4]	Chas. Klingman	T. R. Pael	Brooks Fullerton	Mitchell, Nebr.
Umatilla, McKay Dam	McKay Dam, Oreg	R. M. Conner [5] Ralph Lowry [4]	C B. Funk	W. S. Gillogly	H. L. Holgate	Portland, Oreg.

[1] Project operated by King Hill Irrigation district.
[2] Project operated by Salt River Valley Water Users' Association.
[3] General Superintendent and Chief Engineer.
[4] Resident Engineer.
[5] Construction Engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Sacramento Valley	Berkeley, Calif	W. R. Young	Sacramento Valley Development Association and State of California.
Dubois	American Falls, Idaho	F. A. Banks	Dubois Project Finance Association.
Payette River storage	Boise, Idaho	J. B. Bond	
Milk River eastern tributaries	Hermiston, Oreg	E. R. Crocker	
Pecos River	Fort Sumner, N. Mex	C. C. Elder	State of New Mexico.
No. 3 reservoir site, Pecos River	Carlsbad, N. Mex	L. E. Foster	Carlsbad Water Users' Association.
Spanish Springs storage	Fernley, Nev	A. W. Walker	
Harney Valley	Boise, Idaho	J. B. Bond	
Owyhee	do	do	
Vale	do	do	
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	State of Utah.
Methow-Okanogan	Twisp, Wash	Orrin C. Smith	Okanogan irrigation district.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.

OUTLINE CHART OF THE WORLD



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NEW RECLAMATION ERA

VOL. 17 MARCH, 1926 NO. 3

THE VALUE OF APPLES GROWN ON THE FEDERAL IRRIGATION PROJECTS LAST YEAR AMOUNTED TO MORE THAN $5,500,000, WITH AN AVERAGE PER ACRE VALUE OF $238.81

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Government Publications

Colorado River Development

IN the case of the Boulder Canyon reservoir, there is need for immediate action to safeguard the Imperial Valley and other lands in Arizona and California from the always impending disaster of flood. There is need for an additional water supply for the present irrigated acreage there during years of low run-off and the incidental opportunity of adding largely to that irrigated acreage from Government lands now desert. There is a prospective shortage of industrial power in the Southwest and an assurance that this market will absorb all the power that can be generated at Boulder Canyon at a price that will insure the return of the entire investment with interest within our present lifetime. Under the proposed plan of the Secretary of the Interior, the National Treasury will not be required to advance any funds directly, the enterprise being financed by a Governmental bond issue, and the United States undertaking the development as an assurance of even-handed justice to all the more or less conflicting interests involved. The proposed development thus presents a unique combination of the elements of urgency, immediate utilization of benefits, and commercial and economic feasibility together with similar involvement of national and international interests.

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. 17 MARCH, 1926 No. 3

HIGH LIGHTS IN A REVIEW OF THE MONTH

SALE of the Williston project, North Dakota, to W. R. Davidson, of Williston, for $50,000, has been authorized by the Secretary of the Interior, after the high bidder at a previous sale had refused to execute his contract and forfeited $7,700 to the reclamation fund. Terms of the new sale provide in addition that a rental of 10 cents be paid for each ton of coal mined at the Government-owned project coal mine.

COTTON picking on the Yuma project has been completed and the yield for 1925 will amount to about 26,500 bales. During January 76 cars of cotton, valued at $350,000, and 47 cars of cottonseed, valued at $42,300, were shipped from the project.

THE local Orange Growers' Association on the Orland project, operating independently of any outside marketing organization, packed and marketed last season's crop with gratifying results. Packing costs were reduced from $1 per box to 65 cents, while the quality of the pack has been maintained at a high standard.

AN agreement has been reached by which Minidoka and Cassia Counties, Idaho, will share the services of County Agent J. W. Barber, of the university extension division, and John T. Montgomery, livestock specialist of the Department of Agriculture. Mr. Barber will devote his attention to crop work and Mr. Montgomery to animal husbandry, which will tend toward a simplification of agricultural aid undertakings on the Minidoka project.

A CONSIDERABLE number of real estate sales have been made recently on the Minidoka project. There has also been a heavy liquidation of mortgage indebtedness.

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THE Holly Sugar Corporation announced recently that approximately 3,000 acres on the Grand Valley project were covered by sugar-beet contracts, and that they anticipate an area at least as large as that of last year.

THE new contract offered by the Holly Sugar Corporation to beet growers on the Uncompahgre project contains two changes, both of which are in the interest of the growers. The price of seed to be furnished has been reduced from 20 cents a pound to 15 cents, and the initial guaranteed payment for beets has been increased from $4.50 a ton to $6.

SOME excellent yields of sugar beets were grown in 1925 on the Milk River project. Here are some of the high yields: A. L. LaFond, 15½ tons per acre on 4 acres; Mr. Evans, near Dodson, 17 tons per acre on 8 acres; H. C. Robinson, near Malta, 21 tons per acre on 8 acres; C. C. Mains, near Malta, 28 tons per acre on 2½ acres.

CONTRACTS have been made with each of the two irrigation districts on the Lower Yellowstone project authorizing the expenditure of $7,000 for the design of a drainage system, to be included as operation and maintenance cost in 1926.

TWO sugar factories are under construction in the North Platte Valley, one by the Great Western Sugar Co. at Minatare and one by the Holly Sugar Corporation at Torrington. The Union Pacific Railway has recently completed a 4-mile extension from Cottier to Torrington which connects with the new factory.

CONSTRUCTION of the Pilot Butte Dam embankment, Riverton project was completed on January 18.

THE four sugar factories operated by the Great Western Sugar Co. on the North Platte project finished their run at the end of January, producing 2,090,000 sacks of sugar.

TWO companies have started commercial hatcheries in Scottsbluff, North Platte project, each having a capacity of 40,000 eggs. Several other individuals on the project have operated incubators of 1,000 to 2,500 egg capacity, but this is the first time it has been attempted on such a large scale on the project.

THE directors of the bank at Fallon, Newlands project, have decided to resume the policy of shipping in dairy stock for distribution among project farmers with a view to doubling the dairy population in the valley in the near future. That the average bank deposits during 1925 were approximately $100,000 in excess of those for 1924 is attributed chiefly to the success of the dairy industry.

THE rock excavation for the spillway channel at McKay Dam, Umatilla project, has been completed, 32,200 cubic yards having been removed at a unit cost of $2.25, compared with the estimate of 27,000 cubic yards at a unit cost of $2.50.

ON the Tieton division of the Yakima project $30,377 was collected in January. On the Sunnyside division warrants to the amount of $96,704.77 were received from the Sunnyside Valley irrigation district. Prospects for collections during the next few months are very good.

AT Guernsey dam, North Platte project, work has been completed on trimming the side walls in the diversion tunnel, and on excavating the six cut-off walls in the dam abutments. The cut-off walls have been concreted to a height that makes them safe against high water.

THE UTILIZATION OF THE COLORADO RIVER [1]

Financed through a bond issue, this proposed development will not interfere with the fiscal operations of the Government, but will pay interest on all money advanced and provide a sinking fund for repayment of costs

By Dr. Elwood Mead, Commissioner, Bureau of Reclamation

IN many ways the Colorado is the most interesting large river of the arid region. From the lovely morainal lakes at its headwaters in the Wind River Mountains to the sculptured cliffs of the Grand Canyon it is a river of rare scenic beauty and justly celebrated as such. It is the only one whose valleys are all arid. In them permanent settlement, if not the existence of civilized life, depends on the ability to use water in irrigation.

Six million horsepower to light cities and turn the wheels of industries can be generated by the 14,000-foot fall of its waters from the snow-clad summits of its source to the irrigated farms below sea level near its mouth. Two important cities outside of its watershed, Denver in the Rocky Mountains and Los Angeles on the Pacific coast, look to it for the water supply necessary to their future growth. Denver is now putting a tunnel through the mountains; Los Angeles has voted a $2,000,000 bond issue to build a pipe line.

Thus far efforts to use the river have been directed to meeting urgent and immediate needs of widely separated localities. Such development will no longer answer. We have reached a time when the stream as a unit should be considered. The rights of seven States watered in part by the river should be determined and a foundation laid for their permanent protection.

[1] Address given in New York City, Feb. 3, 1926.

Another reason for this broader conception is that the Colorado is an international stream. Although all its water comes from this country, it flows beyond our boundary and empties into the Pacific Ocean in Mexico.

These economical and political questions press for our attention because of the plight of the people who now live under irrigation in its lower valley. At Yuma the United States has invested about $12,000,000 in the irrigation of land on both banks of the stream. Protection of these lands from flooding has required the construction and each year involves the costly maintenance of protecting levees. The Palo Verde, farther up, is also subject to inundation, and the Imperial Valley, the largest and in many ways the most valuable irrigation district in the United States, is menaced with economic destruction by increasing dangers from flood and drought.

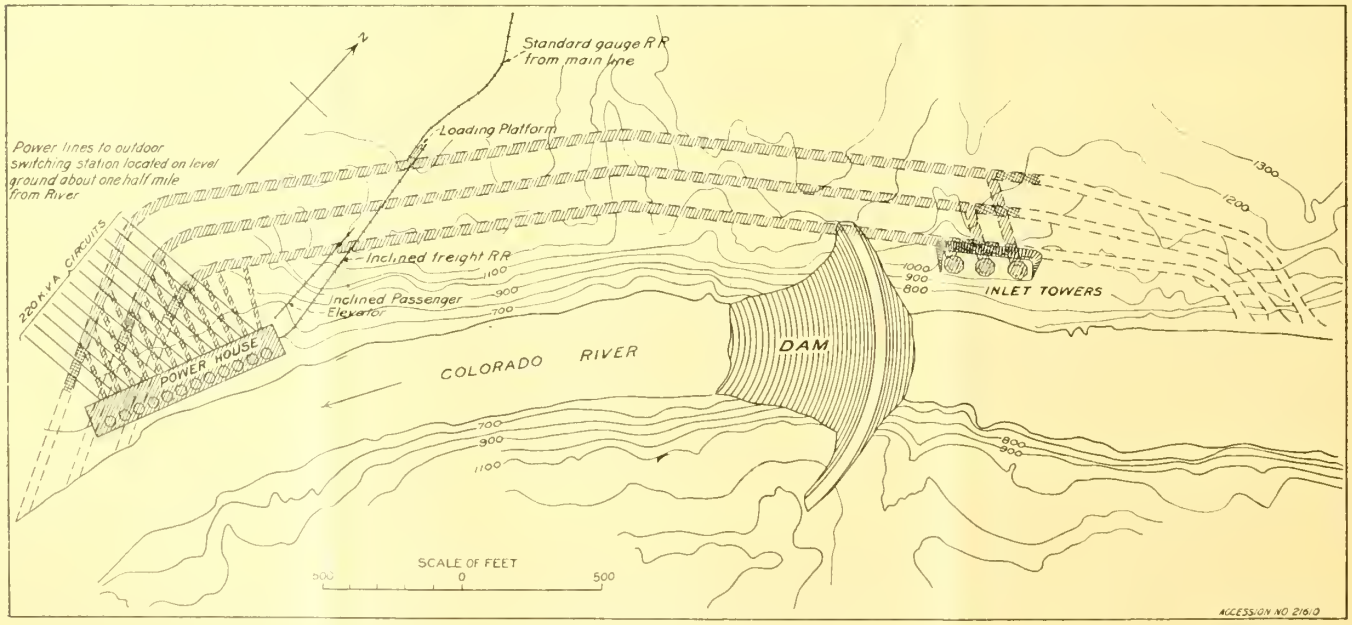
The work to protect these irrigated areas and provide water for the household and industrial needs of growing cities of the Southwest will make possible a great generation of electrical power. So important is this development, so urgent are these needs, that a congressional committee visited this region last year, and a bill has been introduced in Congress for the building of a dam 550 feet high, the creation of a reservoir to hold 26,000,000 acre-feet of water, and the construction of an all-American canal adequate to meet the needs of the Imperial Valley, provide for the irrigation of half a million acres of arid but fertile desert land in Arizona and California, and to rescue the Coachella Valley from an impending water shortage due to the gradual lowering of its underground water supply.

The magnitude and cost of this undertaking make it in every respect a national enterprise, and it is desirable that the Nation should understand its engineering and economic foundation. We will begin the explanation of its problems by a statement of the needs of the Imperial Valley.

AGRICULTURE BELOW SEA LEVEL

In the southwest corner of the United States, below sea level and 100 to 200 feet below the river which supplies water for irrigation, is the largest irrigation district in this country. The yearly value of its products is somewhere between $40,000,000 and $50,000,000. On its farms and in its cities some 60,000 people now live.

On its farms citrus and date-palm orchards are found alongside of barley and long-staple cotton. It shipped 28,000 carloads of fresh fruits and vegetables to outside markets last year. From that valley New York gets its earliest and best cantaloupe, and 15,000 carloads of lettuce were shipped last winter, mainly to eastern cities. The architecture of its towns, the comforts and attractions of its farm



Plan of dam and power plant, Colorado River

homes, the intense cultivation of its fields, combine to make this valley a great factor in the prosperity of the Southwest.

Three decades ago this area was a desert solitude. The summer heat which then beat down on its miles of sand and cactus desolation was so intense that travelers sought safety and comfort by making their journey across it by night. Those who saw it then had no inkling of the agricultural opulence latent in its arid but fertile soil or the grave international complications that would come with its cultivation.

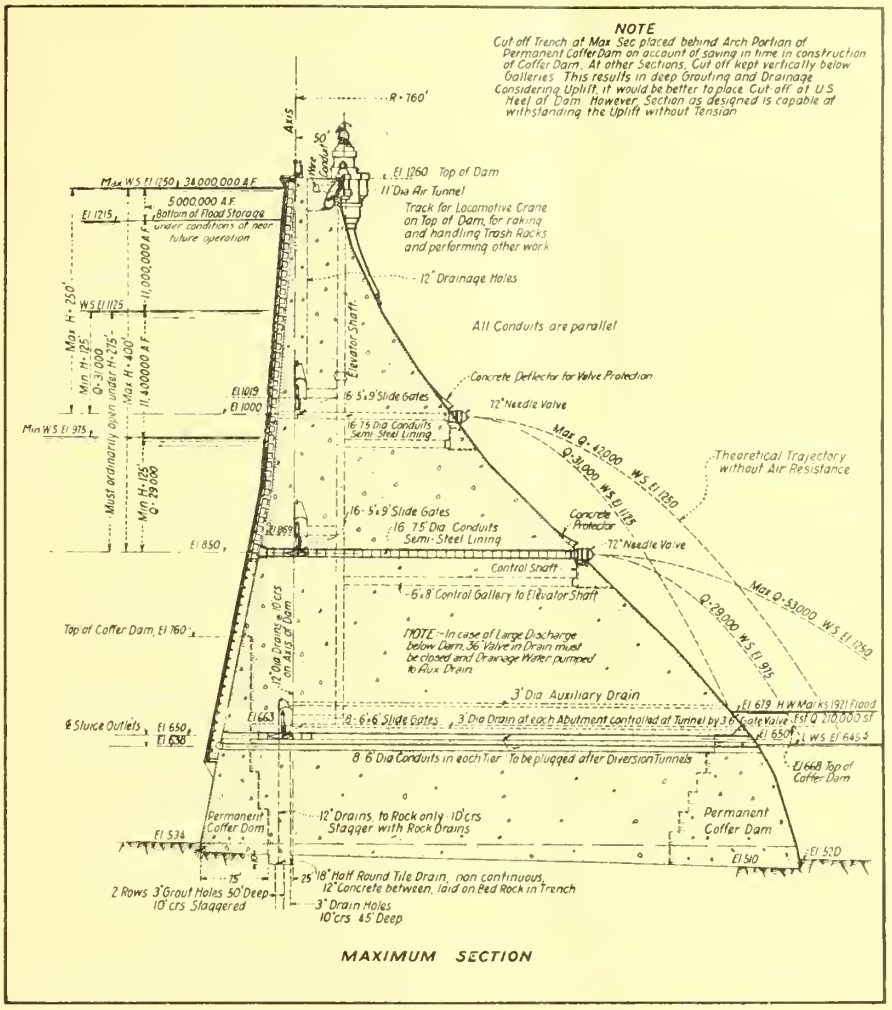
Ages earlier it had been part of the floor of the Pacific Ocean into which the Colorado River poured its tremendous burden of sand and silt, which now every year has a volume sufficient to cover 100,000 acres of land a foot deep. This built up a deltaic ridge across to the opposite margin and cut the northern part of this arm of the sea from its connection with the ocean.

After this happened the river, for a period older than Indian tradition, has discharged into what is now the Gulf of California. The inland lake on the north evaporated, leaving only a small body of intensely brackish water at the bottom of its basin. During the high water of summer the river would overflow its banks, moisten the adjacent soil, and thus nourish the dense jungle growth of trees, weeds, and vines that grew along its bank. This growth let some of the water through, but it held all the silt and thus built up a natural levee several feet high, so that only in highest floods did any water find its way through the bordering jungle growth.

About 20 years ago an engineer with vision investigated this region. He saw the sand and cactus basin on one hand and the turbid Colorado with its fringe of tropical vegetation on the other. A cut through its natural levee would enable the water to be diverted and carried around the rim of this inland bowl. Regulating gates, a main and distributing canals would convert it into a region of farms and homes, but before this could be done an international barrier had to be removed.

It so happens that this deltaic ridge is in Mexico. Also an elevated sand ridge bordering the river north of the boundary makes a canal wholly within the United States very costly. To build a cheap canal this ridge must be avoided, and this could be done only by going south of it through Mexico.

The canal, as finally located, starts in the United States, parallels the river a short distance until it crosses into Mexico, and then turns west, following an old river channel until it returns to the United States, but to build and operate the



NOTE.—Above design for 34,000,000 acre-foot reservoir. Present plans call for 26,000,000 acre-foot capacity, which will reduce height of dam about 50 feet.

canal the consent of Mexico had to be secured and in negotiating Mexico made a shrewd bargain.

That country required the promoters to form a Mexican corporation. To this corporation the Mexican Government granted a concession to build and operate a canal through Mexican territory on condition that up to one-half the water diverted should be delivered to Mexican irrigators if they desire it. These Americans, looking at the full river and the unpeopled desert, had no misgivings as to any ultimate shortage of water. They signed on the dotted line.

With water assured, the irrigable land in California was soon settled and the struggle to develop irrigated farms by men with little capital, and to operate a canal under difficult conditions began. It tested the resourcefulness and fortitude of both settlers and canal managers. The river broke through its natural barrier, left its old channel and flowed north into the Salton Sea, across the new settlement, flooding towns and irrigated farms and threatening to convert the sink into a great fresh-water lake and thus make the greatest change in geography to be found in all history.

It took the resources of the Southern Pacific Railroad, the broad, public spirit of E. H. Harriman, and the genius of Epps Randolph and Harry Cory, of the Southern Pacific, to close this breach. It cost the Southern Pacific over a million dollars, which has never been repaid.

Before that occurred the canal management had, in the great volume of silt which the river carries, a difficult obstacle to overcome. The slower velocity of the canal caused the water to drop its silt burden in a short distance. Two dredges working night and day could not throw it out as rapidly as it was deposited It required another million dollars to build a head gate that would draw water off of the surface of the river instead of taking in the sand moving along the bottom

Then the channel of the river changed. When it was turned back by the closing of the breach in its bank a jungle-like

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THE IRRIGATED AREA IN IMPERIAL VALLEY AND MEXICO

Owing to a combination of advantages, such as cheap labor and water and lower taxes, the irrigated area is extending in Mexico more rapidly than in the United States

(Continued from page 39)

growth had sprung up in the moist bottom of the old channel which formed a barrier to its flow and made it easier to turn west across the arid and unwatered plain. Doing that, made artificial levees necessary to keep the river from flooding over its banks along miles of its course.

Keeping out the floods is a continuous source of expense and anxiety. Many millions of dollars have been expended on levees and canals. These difficulties have not, however, checked agricultural development or the growth of the towns. Irrigated agriculture is attractive and profitable, and the valley is peopled by a remarkable body of enterprising and aggressive farmers and business men.

INTERNATIONAL COMPLICATIONS

This brings us to the international question. The prosperity of the Imperial Valley in California and the great wealth in land and cities which it has created showed the possibilities of the land under this canal in Mexico. Eight hundred thousand acres of this was held in a single Spanish grant, and an enterprising American syndicate, made up of citizens of Los Angeles, bought this and have brought about 200,000 acres under irrigation. In this development thousands of oriental laborers are employed at wages far below those of the United States. Taxes are also lower and water is cheaper, and this combination of advantages enables cotton to be grown more profitably on the Mexican side of the boundary than on the American.

As a result, the irrigated area is extending in Mexico more rapidly than in the United States, and there have been a number of brief periods when there was not enough water in the river to supply the demands of both Americans and Mexicans. During the whole of September, 1924, the farmers of the valley saw their crops wither and perish because there was not half enough water in the river to meet the combined needs of California and Mexico, but as the Mexicans are at the head of the canal and as they were entitled to one-half the water, while there was twice as much land irrigated in California, the pinch and loss came mainly on American irrigators, the damage being estimated at $6,000,000.

American irrigators find themselves, therefore, in this position. They financed and built the canal. They have to maintain and police the levees that protect Mexican land as well as their own. They have to operate under very difficult conditions. Sometimes they have to pay tariff charges when shifting mules across the border in carrying out emergency work on the canals or levees. This has led for a number of years to a growing feeling that there ought to be regulation of the river that would provide an adequate water supply for seasons of drought, and that there ought to be either an all-American canal or an amendment of the Mexican concession for the existing canal that would enable it to be operated on fairer terms.

There is only one way to regulate the flow and that is by a reservoir. There is no chance to build a reservoir after the river enters the plain on the lower 300 miles of its course, but there are opportunities for dams and storage in the great gorge below the Grand Canyon. Long and careful investigations have finally accepted as the most satisfactory site what is known as Boulder, or Black Canyon, about 300 miles below the headgate of the Imperial Valley canal. Here a dam of almost any height can be built. Two, one of 550 and one of 605 feet, have been most carefully studied, and the one of 550 feet, which would impound 26,000,000 acre-feet of water, has been adopted. The average yearly flow of the river is 16,000,000 acre-feet; hence a reservoir holding 26,000,000 acre-feet would impound, without any release

Imperial Valley head lettuce being crated for Eastern markets; 15,000 carloads will be shipped this year. Approximately 25,000 acres of lettuce will be harvested during the coming season

whatever, its average flow for one and one-half years. This makes it possible to so regulate the discharge as to carry over the excess of flood years for those of drought and by so doing avert danger of floods or of drying up canals in dry seasons.

COST OF THIS DEVELOPMENT

To build this dam and an all-American canal will cost about $70,000,000. It is more than agriculture can afford to pay. Fortunately, there is no necessity of its bearing the entire burden. A dam 550 feet high, with a regulated annual discharge of 16,000,000 acre-feet of water, gives an opportunity for a large and profitable power development, and the great cities of California, the mines and industries of Arizona furnish a practically unlimited demand for this power. It is possible to build a power plant capable of generating a million horsepower which will generate continuously, and still meet the requirements of irrigation, 550,000 horsepower. It is proposed to sell this at the switchboard at a price which will bring in a gross annual revenue from power and irrigation of over $12,000,000, and a net revenue of about $6,000,000, which could be placed in a sinking fund to meet interest and repay the cost. The estimated cost of the power plant is $35,000,000, making the total expenditure for power, irrigation, and domestic water supply $105,000,000.

This development not only makes it possible to extend and protect irrigation but insures complete financial solvency, and it can do this and furnish power so cheaply as to constitute a great stimulus to the development of industries in the Southwest.

Thus far we have referred only to the present needs of irrigation. We have not referred to the development of new areas along the lower course of the stream in both California and Arizona. These in time could be expanded so as to double the present irrigated area. There is, however, another and more weighty reason for constructing this storage. Los Angeles is now a city of more than a million people. Its manufacturing possibilities, its attractive living conditions render it certain that its growth and that of surrounding cities are to continue. If it does, more water must be provided. The supply which Los Angeles now obtains from Owens River, through an aqueduct 234 miles long, is practically absorbed in municipal uses and irrigation. Either more water must be provided or the irrigated lands must be turned back to aridity, which to anyone who has seen the agricultural development of the San Fernando Valley is unthinkable. The situation at Los Angeles is duplicated at Pasadena and other important coast cities. Their wealth and prospects justify a large expenditure to provide an additional water supply, and for this they must go to the Colorado River.

The dam and reservoir at Boulder Canyon would therefore protect the lands now irrigated, help to adjust the international water rights with Mexico, extend irrigation along the lower part of the river, provide an adequate supply of pure water for domestic uses to the growing cities of the Southwest, and make possible the generation and sale of cheap power.

THE INTERSTATE COMPACT

Before this can be done there must be an agreement among the States that lie in part within the watershed of this stream and provide the water to be stored. These States desire to see their respective rights in the river adequately protected. To accomplish this result a commission was formed a few years ago, made up of representatives of the seven States and of the United States Government. The commission reached an agreement by which the stream was divided into two sections. Of the 16,000,000 acre-feet average yearly flow of the river, the upper section was to have 7,500,000 acre-feet and the lower section 8,500,000 acre-feet. Six States ratified this agreement, but Arizona has thus far refused to approve it.

The building of this reservoir without some guaranty to the States above would be a menace to their rights by establishing a large prior right. It is proposed, then, that the legislation for this work shall declare that it recognizes the binding effect of what is known as the Colorado compact, and that rights of the upper States established under that compact shall control.

These are the fundamental features of the bill introduced in the Senate by Senator Johnson and in the House by Congressman Swing. When this bill was

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Picking Imperial Valley cantaloupes, of which 15,000 carloads were shippedl ast year

THE UTILIZATION OF THE COLORADO RIVER

(Continued from page 41)

submitted to Secretary Work, of the Interior Department, for report, the Secretary, who is a believer in keeping the Government out of business unless there are weighty public reasons therefor, gave it long and careful consideration to ascertain whether it would be possible to arrange with some private corporation to build these works, but he found so great the difficulties in reaching an agreement regarding State rights, the difficulties which have already arisen in an attempt to allocate the benefits of this development if built privately, the need of some adequate and entirely impartial authority to reconcile and adjust the burdens and benefits of power, irrigation, and water supply, to protect interstate rights and deal with Mexico, that he is convinced it is in the truest sense a national undertaking.

FINANCING CONSTRUCTION

The Secretary recommended, therefore, that this work be financed through a bond issue rather than through direct appropriations from the Federal Treasury. If this is done there will be no interference with the fiscal operations of the Government. It will not require the Government to contribute one dollar in the way of subsidies. It will be carried out under a business organization, paying interest on all the money advanced, providing a sinking fund for repayment of the costs, and using the Government only as a means for obtaining the money on more favorable interest terms than it could be obtained otherwise and as the powerful agency to protect interstate rights and reconcile and adjust the diverse interests involved in its operation.

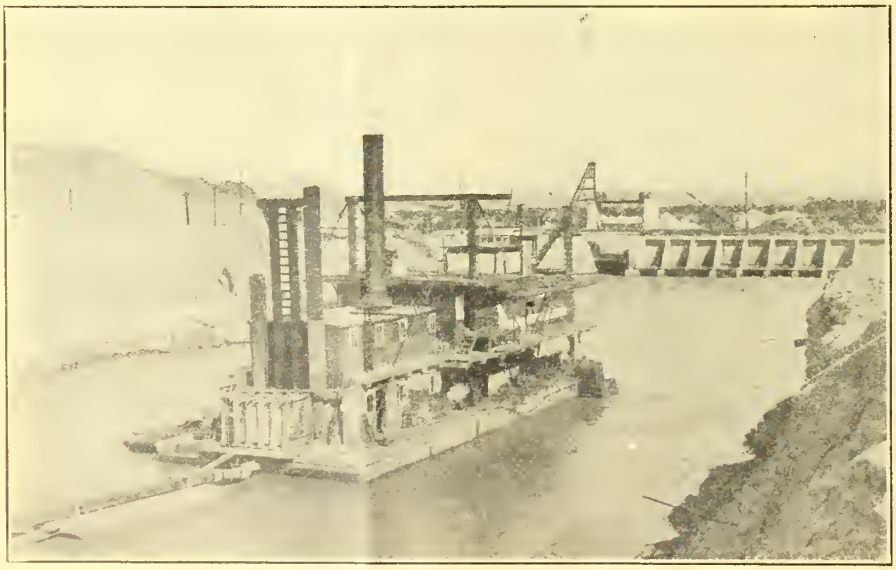
This arrangement has the approval of the upper States. It has the approval of the Imperial Valley. It is believed it will have the approval of the whole country when the need for its enactment and the plan of development are fully understood. Carrying out this work will give new life and confidence to the Southwest. It will mark the beginning of better interstate relations between irrigators on the upper and lower sections of the stream, and it is hoped that it will put an end to the unsatisfactory conditions under which irrigation is now carried out on the two sides of the international boundary.

DR. ELWOOD MEAD GIVES RADIO TALK

Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, gave an address on "Economic Aspects of the Development of the Colorado River" from Station NAA, the Naval Radio Station at Arlington, Va., on Saturday evening February 20.

Doctor Mead discussed the three main features of the proposed development involved in the construction of the Boulder Canyon Reservoir, namely, irrigation, flood protection, and power development, as well as the economic value of the project from a national standpoint including the relation which the proposed development bears to American and Mexican interests in the lower Colorado River Basin.

The Secretary of the Interior recently approved the Swing-Johnson bill, with certain suggested amendments, providing for the development of the Colorado River.



Suction dredge removing silt below Hanlon Heading

COLORADO RIVER BILL—A FEASIBLE MEASURE

AFTER suggesting several amendments in line with his recommendations [1] on the original bill, Secretary Work has informed the House Committee on Irrigation and Reclamation that the revised bill for the protection and development of the lower Colorado River, in his opinion, constitutes a feasible and workable measure.

This bill was drawn up in an effort to meet the proposals of Secretary Work for changes in the Swing-Johnson bill for the construction of the project through a Federal bond issue, including protection of the rights of the upper States and central control by the Government of the power, water, and other privileges.

Not all the recommendations proposed by the Secretary in his first report, however, were accepted by the committee, and the supplemental report amplifies such of these suggestions as were omitted from the new bill.

The most important amendment proposed to the revised bill is in connection with the All-American Canal. The Secretary suggests that the bill be changed to leave optional the construction of this canal in the event that Mexico is unwilling to modify the terms of a concession made by that country to an American corporation relating to the transportation of water through the present Imperial Valley canal.

An amendment is also suggested to remove the granting to certain organizations of preference right to electrical energy developed at the dam. The report recommends that the allocation, sale, and delivery of this energy be left to the discretion of the Secretary of the Interior after opportunity has been had for exhaustive consideration of the public interest and the equities and needs of the applicants.

As to a proviso in the revised bill which suggests two alternatives to the method originally proposed for generating and disposing of electrical energy, namely, the alternatives of leasing of generator units or the leasing of water for the development of power, the Secretary states that inasmuch as the alternatives are left wholly to later determination, thus permitting further study, it is deemed unnecessary at this time to discuss the relative merits of the alternatives in the bill.

The report concludes with the expression of opinion that the bill, with the amendments suggested in the supplemental report "will constitute a feasible and workable measure, under which the purposes sought to be attained through this development may be accomplished."

[1] See New Reclamation Era for Feb., 1926.

SUGAR BEETS ON THE PROJECTS

SUGAR beets valued at $4,373,500 were grown on 13 Federal irrigation projects in 1925.

A recent compilation shows that 679,024 tons of sugar beets were grown in that year on 54,748 acres of land on the Grand Valley and Uncompahgre projects, Colorado; Minidoka project, Idaho; Huntley, Milk River, and Sun River projects, Montana; Lower Yellowstone project, Montana-North Dakota; North Platte project, Nebraska-Wyoming; Klamath project, Oregon-California; Belle Fourche project, South Dakota; Strawberry Valley project, Utah; and Shoshone project, Wyoming. This represents a yield of 12.4 tons per acre compared with 8.6 tons in 1924, and an average value of $79.88 in 1925 compared with $61.47 in the preceding year.

The largest area in sugar beets, amounting to 21,178 acres, was on the North Platte project, the value of the 308,627 tons of beets amounting to nearly $2,000,000, or $91.81 per acre. The largest yield per acre, amounting to 16.1 tons, and the largest value per acre of $133.25, were found on the Belle Fourche project, South Dakota.

Nearly 90,000 tons of sugar will be produced from the beets grown on the Federal irrigation projects last year.

Sugar beets on the projects

Project	Year	Acreage	Yield		Value	
			Total	Per acre	Total	Per acre
			Tons	*Tons*		
Grand Valley	1924	2,580	21,682	8.4	$173,460	$67.23
	1925	1,704	23,377	13.7	151,950	89.20
Uncompahgre	1924	5,934	43,210	7.3	324,082	54.61
	1925	4,205	53,510	12.7	347,815	82.72
Minidoka	1924	11,550	41,916	3.6	273,008	23.63
	1925	7,039	67,972	9.6	475,804	67.59
Huntley	1924	5,929	58,860	9.9	529,722	89.34
	1925	4,456	49,572	11.1	322,278	72.30
Milk River	1924	230	1,500	6.5	11,280	49.04
	1925	[1] 1,009	7,772	7.7	50,518	50.50
Sun River	1924	61	360	5.9	2,888	47.34
	1925	260	1,756	6.7	10,537	40.52
Lower Yellowstone	1924	6,590	63,970	9.1	383,820	58.24
	1925	6,952	60,202	8.7	361,272	55.97
North Platte	1924	22,087	255,930	11.5	1,740,351	78.79
	1925	21,178	308,627	14.5	1,944,349	91.81
Klamath	1924					
	1925	206	1,535	7.4	12,280	59.61
Belle Fourche	1924	1,281	9,860	7.7	86,249	67.32
	1925	1,238	19,997	16.1	164,975	133.25
Strawberry Valley	1924	7,568	53,560	7	374,892	49.53
	1925	4,712	61,208	13	367,251	77.94
Yakima	1924	272	344	1.2	2,070	7.62
	1925					
Shoshone	1924	2,797	26,570	9.4	209,406	74.86
	1925	[2] 1,789	23,496	13.13	164,472	92.49
Totals	1924	66,879	577,762	8.6	4,111,228	61.47
	1925	54,748	679,024	12.4	4,373,501	79.88

[1] 1,111 acres frozen and not dug.

[2] 353 acres frozen and not dug.

APPLE CULTURE ON THE PROJECTS

THE value of apples grown on 12 of the Federal irrigation projects in 1925 amounted to more than five and a half million dollars.

A recent compilation shows that in that year 23,758 acres were included in apple orchards on the Orland project, California; Uncompahgre project, Colorado; Boise, King Hill, and Minidoka projects, Idaho; Carlsbad project, New Mexico; Rio Grande project, New Mexico-Texas; Umatilla project, Oregon; Strawberry Valley project, Utah; Okanogan and Yakima projects, Washington; and Shoshone project, Wyoming, produced 276,495,324 pounds of apples, valued at $5,673,680, or $238.81 per acre. Although the total acreage in 1925 was about 1,000 acres less than in 1924, the value of the apple crop in 1925 was more than a million and a half dollars greater than in the preceding year and the value of the crop per acre more than 40 per cent greater.

The Yakima project in Washington leads all other projects in acreage, yield, yield per acre, value, and value per acre. Sixty-five per cent of the total acreage, nearly 80 per cent of the total yield, and more than 75 per cent of the total value of apples are found on this project. On this project the average value of apples per acre in 1925 amounted to $282, compared with the average value per acre of all the projects of $238.81. Other projects on which the average value of the crop per acre exceeded $200 are the Orland, Rio Grande, and Okanogan.

Apples on reclamation projects

Project	Year	Acreage	Yield		Value	
			Total	Per acre	Total	Per acre
			Pounds			
Orland	1924	3	10,000	3,333	$188	$60.00
	1925	3	13,500	4,500	750	250.00
Uncompahgre	1924	1,727	7,093,665	4,107	107,316	62.14
	1925	1,640	6,647,985	4,053	95,354	59.36
Boise	1924	1,698	3,687,045	2,172	87,047	51.56
	1925	974	5,597,976	5,747	94,963	97.50
King Hill	1924	325	196,950	606	5,086	15.65
	1925	251	1,036,186	4,115	18,334	72.80
Minidoka	1924	63	58,130	922	1,162	18.44
	1925	190	498,373	2,643	2,492	13.11
Carlsbad	1924	10	20,000	2,000	605	60.50
	1925	7	3,375	481	150	21.43
Rio Grande	1924	412	4,880	118	241	.58
	1925	578	5,349,105	9,254	130,509	225.79
Umatilla	1924	455	(1)		1,105	2.43
	1925	382	883,225	2,312	18,548	48.55
Klamath	1924	2	[2] 20,000	10,000	400	200.00
Strawberry Valley	1924	157	605,150	3,855	12,103	77.08
	1925	221	1,477,683	6,686	27,439	124.16
Okanogan	1924	3,525	25,000,000	7,092	656,248	186.12
	1925	4,038	35,847,000	8,865	900,158	222.92
Yakima	1924	16,390	121,369,120	7,405	3,279,245	200.07
	1925	15,528	219,017,554	14,104	4,380,351	282.08
Shoshone	1924	34	35,760	1,052	894	26.29
	1925	7	1,045	149	31	4.48
Totals	1924	24,801	158,100,700	6,375	4,151,640	167.39
	1925	23,758	276,495,324	11,217	5,673,680	238.81

[1] Failure.

[2] Estimated.

SECURITY AND INCOME ESSENTIAL ON NEW PROJECTS

These two desirable conditions must be created. The safest way is to put on the land a good settler with some capital, which creates the security, and then loan him money on terms he can meet on a mutually agreed agricultural program to create income

By George C. Kreutzer, Director of Reclamation Economics

(NOTE.—Recently Mr. Kreutzer received a letter raising the question of whether there was any necessity for aid in settlement, and expressing the belief that the question of settlement and farm development could be ignored in the future as in the past. The article below is Mr. Kreutzer's reply.)

IF we look backward at the irrigation development in this country a careful analysis will show that only in rare cases did the investors who bought the securities of irrigation enterprises have returned to them their original investment and the annual interest those securities were supposed to earn. In Colorado, even as far back as 20 years ago, the records showed that there were only two irrigation enterprises in the State, constructed by borrowed money, which had fully met their obligations. The other enterprises adjusted their debts with their creditors, the adjustments varying from compromises in interest to a complete repudiation of their obligations. These projects were simple as compared with projects now considered for construction both by private interests and the Government. Irrigation securities have not been purchased generally by those familiar with these records. My acquaintance with engineers, contractors, and business men who live in or near irrigation developments has disclosed that not one has an irrigation bond of a new irrigation district in his safety deposit box.

The financial record of Federal projects is only a little better than the record of the projects constructed by private interests and that is due to the interest-free feature of the debt and to the generous relief granted from time to time, which undoubtedly was abused but in some cases where a profitable agriculture had not been developed was needed.

This default in the payment of bond interest on privately developed projects and needed relief on Federal projects is due entirely, except when organized repudiation prevailed, to the lack of skilled cultivators on the farms and a general program of intensive agriculture on the project. Skilled cultivators and intensive agricultural conditions finally prevail on projects where soil, water, and climate are favoring, but the time between this condition and the pioneering stage is too long, and serious financial losses are incurred both by settlers and the development agency. The Turlock and Modesto districts of California required 15 years to accomplish this, yet, in my opinion they were surrounded by the most favorable economic conditions of any districts I know of in the West.

GOOD INCOMES FROM GOOD FARMS

I think you will agree that good incomes are made only on farms that are well tilled and well equipped. To get a farm in that state requires that it be cleared, leveled, ditched, fenced, and that buildings are constructed to house the family and livestock. The successful farmers generally have work stock and tools. These can't be borrowed. Take the analysis of developing and equipping a 40-acre farm, as given in the economic report on the Vale project, and let us criticize it to see if intensive agriculture can be accomplished safely and more cheaply.

The land is valued at $7.50 an acre. The committee now values it at about $10 an acre. The house is to cost $600. The family who lives in that house won't have a bathtub nor running water in the kitchen. The best that can be secured for that amount of money is three small rooms with no conveniences. A barn is given at $400, yet a good barn will cost $1,000. The slightest consideration given to the cost of chicken houses, pigpens, well and pump, fences, and corrals will show that they are a minimum. They are all needed. The chickens can't roost on the sagebrush. You must have stock and domestic water and a pump to get it out of the well.

SMALL CAPITAL MEANS SLOW DEVELOPMENT

Forty acres of clearing and leveling are given at a cost of $1,000. Some say, let him do it himself. If he does, he and his family must eat and his work stock must be fed and every bit of it must be bought. Even a good settler can't work much over 10 or 12 hours a day. His first need is a house, outbuildings, domestic water, and a corral. When he is providing these needs he is not clearing and leveling land and planting crops. Generally this part of his program is neglected. My experience has been that the new settler with an initial capital of $2,000 or $2,500 is fortunate if he clears and prepares 10 acres of irrigation the first year. The sum of $1,000 must be put into this improvement. It makes little difference if it is spent under contract or for hired labor, food, and supplies. If it isn't put in, delayed development will result except in rare cases. The other items for equipment, livestock, seed, operating expenses, and personal expenses are at a minimum. If they are not, I would be glad to know the exceptions. Yet with these minimum expenses the total shows an expense the first year of $5,600.

In paragraph 18 of your letter you state that in your experience it has been found that only about one-fourth of $7,000 is needed to get a settler established on 80 acres of sagebrush land. You state that $20 an acre is needed to put the land in alfalfa or clover. I think your estimate is low for average conditions for this character of development. If the land was quite smooth it could be done. Granting that this figure is correct, he still has a house, outhouses, fences, domestic well, livestock, and equipment to provide. He must have food while he is developing the farm. I would like your estimate of what these things ought to cost for an 80-acre farm in Idaho, because it will give us a comparison with the figures we have on this matter.

In paragraph 17 reference is again made to the cost of developing farms at about $20 an acre. You do state, however, that this does not include any expensive outbuildings. My judgment is that it only included clearing, leveling, ditching, and planting crops. If this is all that has been put into the farm, then those things enumerated in the previous paragraph are needed to make it a going concern for a resident settler.

CAPITAL REQUIREMENTS

I think you misunderstand the capital requirements of settlers as discussed in these reports. In paragraph 18 of your letter you refer to a great number of tenants having teams, farm machinery and tools, and furniture. If they have these things, then it follows that they do not have to buy them. It is, however, part of the settler's capital and is as useful as money to him. The regulation promulgated under subsection C of the act of December 5, 1924, recognizes this by the statement that the settler shall have at least "$2,000 in cash, or the equivalent thereof in livestock, farm equipment, or other assets deemed to be as useful to the settler as cash." All discussions of the capital requirements of settlers recognize that farm equipment, livestock, etc., are a part of the settler's capital.

Your statement that few men who have reclaimed land in the arid West had $7,000 in cash to begin with is certainly true. When we subscribe to this statement we must not overlook the fact that a con-

siderable amount of money invested in these irrigation works was lost, and even in the more successful enterprises is not yet repaid. Also, conditions have changed, Water rights are not cheap. Twenty years ago a water right costing $25 an acre was considered high. We will start construction on a project shortly where the water right will cost $160 an acre. Everything that goes into a farm costs from two to three times as much as it did 20 years ago. This applies to every commodity the settler buys.

WHEN LOANS ARE MOST NEEDED

In paragraph 22 reference is made to the Federal land bank and that any advances it could not make may be unsafe. The land bank is an institution detached from reclamation. It makes loans from only two viewpoints. One is that the loan shall not exceed 50 per cent of the value of the land. The other is that the farm shall be brought to such a state of production as to insure that the borrower can pay all his fixed charges, including the installments to the bank, and live. Both principles are sound when the loaning agency does not control the land and can not supervise the expenditures of the loan. Local banks and other loaning agencies are in the same position. This condition leaves a gap in the development program of settlers between the time they have spent all of their money and the time the farm is brought into profitable production. It is at this time most of them go broke and that delinquencies occur in the repayment of their obligations. In actual cases it is usually the third year after settlement. At this time loans are the most effective agencies to avert disaster, and as yet no agency is designed or clothed with the necessary authority to make them. A practical application of rendering this assistance would be to loan the settler 50 or 60 per cent on improvements effected by his own labor and capital to complete the development of the farm or buy good stock, if these were needed to increase earning power. The loaning agency must control the title to the land. The loan would only be made on a program agreed to by both the settler and the agency, and the funds turned over only as fast as that program materialized. This is where the supervision comes in. A lack of such a complete program has been the cause of the land bank and other loaning agencies acquiring too many farms in recent years. In many cases the capital from loans did not go into good stock, leveling, and other reproductive investments. Too much went into the purchase of more land, and, in many cases, automobiles and other luxuries.

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The loans we refer to that should be made under supervision satisfy both the conditions set up by the land bank. The security must be there, and, secondly, the loan itself, when expended to create a profitable agriculture, guarantees that the income will be sufficient to repay it. No one who advocates this plan ever thought that loans would be made in any other way. I wish you would particularly consider the two points involved in these loans and find a flaw from the standpoint of sound business. I would particularly like to defend the plan.

SECURITY AND INCOME MUST BE CREATED

The weakness of the past irrigation development program on both private and Federal projects is that the construction of the system is accomplished with borrowed money and is therefore a loan, yet the only security given is raw land of low value and no immediate earning power. The land itself is generally not worth more than a few dollars an acre. Earning power is only to be had when some one puts capital and labor into the farm so that the construction debt may be paid. It is like building a factory without putting the machinery in it or like having a cattle ranch without cattle. Certainly it has neither of the two conditions demanded by the land bank before making a loan, viz, security and income. These two desirable conditions must be created. The safest way to do it is to put on the lands a good settler who has some capital, which creates the security, then loan him money on terms he can meet on a mutually agreed agricultural program to create income. This is the only way to get early farm development and consequent earning power if the settler has not the capital to do it himself. If we insist on both security and income before the works are built, then not another reclamation project could be built. What is being insisted upon is a program that will create these two desirable conditions, which may be accomplished by State aid, Federal aid, or even private sources. It matters little which one does it as long as it is a part of the reclamation program.

Your reference to land speculation and the conditions written in the Kittitas contract as safeguards is certainly meritorious, as these will do away with one of the evils of reclamation. That in itself will not create prosperous farm owners or an intensive agriculture. This can only be done by completing the job, which is to provide for farm development and organized settlement.

MARKETING FACILITIES ON IRRIGATION PROJECTS

In the December issue of the NEW RECLAMATION ERA lists, by projects, were printed of cooperative organizations or groups of farmers associated for marketing agricultural products, of organizations or individuals who contracted during the year with the water users for growing specified crops and the acreage and value of crops so contracted, and of manufacturing concerns on the projects for changing raw products into more concentrated form.

At the time of going to press not all the projects had submitted the data requested. The following supplemental data have been furnished by the following projects:

MILK RIVER PROJECT, MONT.

Cooperative organizations.—Livestock-marketing association; livestock-shipping association; poultry-marketing association; poultry-shipping association; three elevator companies; farm bureau; two shipping associations; certified seed-potato growers' association; cooperative association; alfalfa growers' association; produce company.

Crop - contracting organizations.—A sugar company contracted for 6,000 acres of beets, with an estimated return of $450,000.

Manufacturing concerns.—Three creameries; three flour mills; a sugar factory.

CARLSBAD PROJECT, N. MEX.

Francis G. Tracy, of the Carlsbad project, N. Mex., calls our attention to the fact that there are seven cotton gins and one cottonseed oil mill on the project.

GRAND VALLEY PROJECT, COLO.

Cooperative organization.—Potato growers' exchange; beet growers' association.

Crop-contracting organizations.—A sugar corporation contracted for 1,743 acres of sugar beets, with an estimated return to the growers of $155,480. Canning companies contracted for 252 acres of tomatoes, with an estimated return of $35,500. In addition a large tonnage of pumpkin, beans, apples, beets, and cherries were canned, returns from which are not known. A seed company contracted for 131 acres of beans, sweet corn, pop corn, pumpkin, and squash, with a return of $8,550.

Manufacturing concerns.—A sugar corporation; two canning companies; flour mill; milling company; creamery; and packing company.

The bureau was well represented in the recent department exhibit at the National Education Association meeting.

FARMERS: INVENTORY AND APPRAISE CHARACTER! III

It is under stress that the possession of character or the absence of it is brought into clearest outline, whether the consequence of stress be a determination to make good in spite of difficulties or in discouragement or finally in despair

By Copley Amory, Expert in Reclamation Economics

IT is noteworthy that on these reclamation projects on which many farmers are in default for construction and other charges certain farmers not more advantageously placed than their neighbors are nevertheless not in default and are successful and spurn help.

These cases of contentment amidst discontent and of competence amidst need must be due to character. The dictionary defines character as attributes due to nature, habits, or environment. These attributes of character are intelligence, energy and integrity, and the greatest of these is integrity.

Such three attributes of character have made the American farmer what he is, but are not shared in equal degrees by all farmers. It thus comes about that the possessor of these qualities may prosper alongside of a neighbor who is without them. The delinquent believes, and often honestly, that the world is at fault for his troubles and that relief from outside is rightfully due him. In times of stress the appeal is louder, the sense of injustice greater, and the danger of a sympathetic but mistaken response from Government agencies more acute.

THE ORIGIN OF CHARACTER

It is under stress that the possession of character or the absence of it is brought into clearest outline, whether the consequence of stress be a determination to make good in spite of difficulties or in discouragement or finally in despair. If the reaction be determination we may be sure that it is due to character and that form of character which the dictionary describes as "the sum of good qualities which distinguish one person or thing from another."

Whence comes this quality of character which can scarcely be seen or heard or measured except in action and which is especially visible under stress? It can not be bought or borrowed. How, then, can it be acquired? It usually descends from father or mother or both to son. It sometimes skips one generation and arrives again with all its genuine earmarks in the next. One of its peculiarities is that having some, more can come, by mere resolution in about the same manner as increase comes to a savings bank account—by mere resolution carried out to have more. Its possession is attended too by this circumstance, that the more one has of it the easier it is to acquire still more, indeed, "unto him that hath shall be given."

Its possessor does well to give frequent attention to his inventory to observe whether character is listed there. As a means of noting and appraising character, it is only necessary to observe the progress of the farm, the contentment of the family, the regard of the neighbors, the well-being of the livestock as measured in the smoothness of their coats and the placidity of their eye. And whence comes it? Like the petroleum underground, it has a long history, further back than the beginning of our civilization and further back into that long indefinite period of prehistory to when men first protected their wives and families from wild animals and from their predatory neighbors, from when, later, they conducted long voyages by sea or migrations by land, and, later still, when Englishmen came overseas to settle in the wilderness of the eastern Atlantic coast.

THE CONNECTICUT SETTLEMENT

As a part of this migration, and perhaps the most significant part, the history of the settlement of Connecticut River Valley offers an interesting example. This example shows how people of character develop from nature, habit, and environment more character, and how, after a century and more, devoted this, their character, to the development of our whole country.

The Connecticut Valley in 1633 was a virgin forest, mostly of white pine, from Long Island Sound to its source, some 350 miles nearer Canada. Here was a fertile valley with an ample and well-distributed rain fall, a genial climate, as temperate climates go, and healthy though with extremes of heat in summer and cold in winter. Its nearest point was three days' march from any settlement on the coast.

This valley was infested as to its whole length with Indians, one or more tribes of whom maintained hostilities almost continually for 150 years. These Indians possessed firearms soon after their contact with our settlers and far outmatched them in the art, reluctantly acquired by white men, of forest warfare. For the first 200 years of their struggle to maintain themselves the valley farmers depended upon their farms for food and clothing, necessities and luxuries, guns, powder, and iron excepted.

The land required to be cleared and stumped and laborers in the field to be constantly protected by sentinels from Indian stealth. Their markets were those of barter and were home markets until the enterprise of the coast communities afforded an export outlet for their produce to many parts of the world, and in fact wherever the vessels of the whaling industry went. Ax and plow, scythe, cradle, and gun were their implements; their spinning wheel and looms their textile machinery; their Bibles, their books; and for some of their early years of settlement in the lower valley they were their own beasts of burden.

QUALITIES OF SELF-RELIANCE AND HARDIHOOD

These conditions grafted on to their already sturdy character resourcefulness, self-reliance, and, in the process of natural selection, strength and endurance. That this natural selection was in active operation the large families in which the least fit did not survive infancy is in evidence on the tombstones of all New England graveyards. That hardihood was one of their qualities let the history of the towns of Cornish, in New Hampshire, and Windsor, in Vermont witness.

Midway between the river's banks and in sight of these towns a small alder-grown island lies. Every year soon after the disappearance of the ice the boys of Cornish and Windsor swam out, each boy with his knife between his teeth. On reaching the island each cut an alder branch and each sought by belaboring the naked skin of his opponent to prove his better courage and maintain possession of the island. And, again, in none of the families of the poorer farmers did they have the protection of underclothes or socks from the cold of their rugged winters. Again, they mowed their grass and cradled their grain without the aid of mowing machines or reapers, and labored during daylight to cut each man perhaps his acre a day, helped by a ration of New England rum which each man carried to the field. Again, they fought the Indians for possession of their lands, giving for a long time odds in numbers, and continued the warfare from generation to generation. Again, their sons helped man the whaling vessels of Nantucket and coast towns and brought the whale oil from the ends of the seven seas to compete with their homemade tallow dips. Again, they served in the

expedition of Lewis and Clarke, and afterwards, among the early pathfinders, led the way in trapping and prospecting. They later helped reclaim the prairies, and later still the plains and mountain valleys for agriculture. Again, they published at home many books and newspapers of a high order at a time when their earlier settled neighbors in Quebec scarcely knew the advantage of print and were for the most part without education. Again, they and their neighbors of New England established town government and a system of public education upon which American progress is based. Again, and at a later date, they established those industrial and financial corporations which have contributed in great measure to the industrial development of our country the control of many of which have only in recent years passed to larger communities.

ENERVATING INFLUENCES ON CHARACTER

If this story of fortitude and progress serves to illustrate the meaning of character and helps us to visualize the service of character in the development of agriculture and of our complex modern life, the same story serves to illustrate also how the maintenance of this character is essential for the continuance of the well-being of agricultural communities and is in turn their contribution to the strength and stability of the Nation.

In order to inventory character we must learn to recognize it, and in order to appraise it we must visualize its origin, its development, and significance. As to its prevalence in agriculture to-day, when we seek to recognize it we then find its supply is diminishing, and upon attempting to appraise it that its quality is less virile and that its sources are drying up, because modern industrial life is unsympathetic and almost hostile. Just as the extraordinary attainments of Indian character decayed before civilization, so the character of that rugged sort essential to enduring agriculture decays before the self-indulgence and enervating influence of modern life. This decay of character begins on the farm before its actual contact with the indulgent and enervating influence of urban life. The advantages of city life, more apparent than real, as portrayed in movies and comic pictures, attract and raise false hopes.

The Connecticut River men led the way across the prairies over the Mississippi and later, and as a smaller proportion of all the pioneers, across the plains and Rocky Mountains until now farther westward progress is limited by the Pacific Ocean. All the wealth of fertility formerly to be had for the asking, not often conserved but often lavishly used or wasted as soon as possession was taken, is ended forever.

When, like Balboa, he reached the Pacific Ocean, the pioneer turned half round and viewed the continent, but, unlike Balboa, finds its worth-while spare places all occupied. He hesitated, questioning whether to accept the new conditions of agriculture, abandon his pride of independence, exchange his sense of having been a man of business, a speculator in land, for his new and inevitable lot of a toiling cultivator, pure and simple. Now undoubtedly the wiser turn back again eastward and resolve, prompted by that inherited character, which we have inventoried and appraised and which has always stood in time of need, to become cultivator, conserve the remaining fertility of the soil, and accept thrift, diligence, and self-denial as the price of prosperity. They must, too, as a part of the new condition, realize that the cultivator is a constantly diminishing minority no longer able to assert even such political rights as he formerly could, but content with what he can exact as a suppliant. In the course of the farmer's political history since the Civil War he has made a succession of efforts to receive special consideration at the expense of other political groups. Each succeeding effort has met with less consideration and success than its predecessor, and has shown, even though the lesson has been largely lost, that relief for himself and for his industry lies in remedial measures applied from within and not from aid, however well its nature may be concealed, from without. They now begin to see that in order to maintain the influence due to even this minority they must hastily learn from the other estates what knowledge of organization, propaganda, and effrontery can do, and how essential they now are, even as essential as the gun and plow of early days, or as later, the pioneer spirit, to maintain them in anything like their former relative position.

NO EASY REMEDY

The lesson of the manufacturer and his tariff, the transport worker and his Adamson law, the other workers and their unions, the restriction of emigration, this last helping all but himself and helping others at his expense, spreads before his confused vision. As the economic laws governing his land, and his farming operations expand in clearer knowledge, he even now only just begins to realize that he can only diagnose his case, and comes there to an abrupt halt.

No quick or easy treatment, at the same time equitable and available, is at hand to save him. If he has the tradition, leisure, and inclination, he can recall the story of early settlers. If he chances to have still sufficient of this character of his forbears, and I think he has, he will join the successful minority of his brother farmers and evolve at first painfully and slowly, by again breaking himself to labor and from the experience of modern civilization in other countries, many systems of self-imposed disciplined cooperation, in both production, distribution, and marketing, which will bring him to his own and along with his own welfare the safety and welfare of the nation.

Mormon Flat dam, Salt River project, Ariz.

FARM PROBLEMS IN THE SOUTHWEST[1]

By Hon. Thomas E. Campbell, Chairman Southern Division, Board of Survey and Adjustments

MR. CHAIRMAN, ladies, and gentlemen, I have been assigned a subject that is interesting to me and interesting to all who are interested in reclamation, and that is "Farm problems in the Southwest." I could answer that in a single sentence—that we have no problems down there except more water, because we chance to be blessed with sunshine, climate, and soil, so that the result is that the other things come.

I have been interested in this subject a long time, even before we had a reclamation act, because we in the Southwest appreciated that if we wanted to make of these great areas a section of this Nation which would be worth while we would have to bring the water to the land; we could not depend on rainfall. Of necessity it meant that we had to be a part of some movement of this kind. I am proud to be here testifying to our belief in this great experiment.

We heard yesterday discussion of the settlement question and everybody seemed to concur in the idea; at least I noticed that we all bobbed our heads about the three sets of settlers to settle up projects. The facts are that 65 per cent of the original settlers on these projects are still there. We also hear it said that so many people come to these projects, and have come to them, without any previous experience or knowledge of reclamation in the art of irrigation—that they are shoemakers, barbers, broken-down lawyers, etc. The facts are that 73 per cent of them had previous farming knowledge. We find this interesting thing on the so-called good projects. I refer with a good deal of pride to those in my own section of the country. We find on the Salt River 90 per cent had previous experience; two projects in New Mexico, 94 per cent. The same thing would hold true as to the type of people. They are American-born people.

We also hear a good deal about tenantry. It is a problem. I am taking the average of the tenant proposition. We had referred to yesterday some very interesting tables here showing the tenantry in Illinois, Indiana, and in the South, and if you recall it ran over 50, 60, and 70 per cent over a period of two, three, and four years. The smallest percentage of tenantry is upon the poorest projects, indicating that the tenant is the professional mover. He goes to the projects where he can make the most money. He stays away from those where the income is small and it is impossible for him to make a living.

NO OVERPRODUCTION

We find also the question of over production discussed from high sources, yesterday referred to by Secretary Jardine, this morning by Congressman Smith. As to bringing in new areas of lands, and particularly referring to the subject of reclaimed lands, I find this interesting thing—that the total gross production this last year on all of the so-called Federal reclamation projects is a little less than 1 per cent of the total agriculutral production last year of the country as a whole. It is interesting to note that this production is of a type of agriculture that is not competitive with the other areas that are antagonistic, in my opinion, to a promulgation of this idea. The only thing that goes on a general competitive market is cotton. The other productions are fruits, nuts, and vegetables out of season, or else it is for local consumption. A great quantity of alfalfa goes into the feeding on the farm or local competition. It does not move into the other districts unless there is a scarcity and the freight rates allow it to move into other points.

NO POLITICAL PRESSURE

It was also stated here yesterday, and I noticed that it received a good deal of applause, that one of the difficulties was a political selection of projects and not a selection by merit. Having enjoyed the confidence of the people of my State for a number of years in public service, I think probably I can qualify as a politician. I am going to defend the people who are referred to as politicians. The original act prescribed that a major portion of all the money derived from the sale of public lands at that time should be expended in the States or region, but the selection of projects from 1902 to 1910 was left to the Reclamation Service. It was very interesting to me in my studies on the Fact Finding Commission interrogating the two directors of the service at that time as to what effect political pressure had on them in the selection of these projects that, with the exception of one, they stated there had been no political pressure brought upon them. This was the Milk River, which involved an international question between this country and Canada. The projects selected were the best projects available in those prospective States, and following the mandate of the law they selected them where they did.

Since 1910 the selection has been in Congress, and only two have been selected since that time. This is a political government and every activity of the Government reflects political action; we can not get away from that. We don't get away from it in our traffic laws, bonus, and pension, Federal aid, location of public buildings, harbors, and rivers. Every physical activity of this Government is political because it reflects the demands of the people who send representatives here, and the interesting thing to me is that we don't make more mistakes than we do. I don't give very much weight to the fact that we can not be efficient because we are political. I appreciate that that might be a fact, but that is one of the penalties we pay for having our form of government where we are represented.

I intended to make some comparisons of the good and poor projects, but they are always odious. The only purpose was to draw certain conclusions which this study we have been on for some time makes possible, but we do find this situation—that the great difficulty, in my opinion, in agriculture, and it has this effect on the question we are discussing this morning, is the fact that the farmer's dollar is not big enough compared with the other dollar. I say that because where they have high production in the southwestern projects we have no difficulty in the matter of settlement.

MUST RAISE PER-ACRE INCOME

The four southwestern projects—Salt River, Yuma, Carlsbad, and Rio Grande—have a total area of 445,000 acres. That represents approximately 26 per cent of the total area to be irrigated and 33⅓ per cent of the total irrigated to-day; but when we find that from 26 per cent of the area, 58 per cent of the gross production occurs, you can appreciate that we have not any settlement problems. There is not any in that country. The average gross production over the last five years is $94.45 as against an average over all the projects (in which that percentage is also included) of $54.45; the point being that, in my opinion, wherever people can make production comparable with the present demands of living and desire in this country you don't have those problems.

[1] Address delivered Dec. 15, 1924, at the Conference on Reclamation and Land Settlement, Washington, D. C.

Wherever the production is low then we have what may be termed our "sick projects."

One of the projects referred to by Mr. Kreutzer in his talk had an average production of $16.50, which includes the big war years, running up during the war to $25. That can be improved, and the problem that confronts reclamation today is to increase the production upon all projects that have less than a $40 production. I don't believe that there can be the so-called successes and continue on this work unless we can approach $40 an acre as a minimum.

It is interesting to refer to the whole situation of agriculture, and when I say in round figures that the income from agriculture at the present time, according to figures taken from the Department of Agriculture, shows only a net return on an American farm of approximately $200 a year, out of which a man must live—the things outside of his rent and his food—and 6 per cent on his investment, it is not very alluring. What laborer in the city, or business man if he had an investment of $5,000, would think of working all year long for his rent, fuel, food, and $200 a year? So I say that Doctor Widtsoe said a mouthful when he said that agriculture is not a business but a mode of living, and we who are interested in reclamation, in the perpetuity and expansion of the idea of reclaiming the waste places, the cut-over lands, the skimmed-milk lands of the New England States, must look upon it not as a business proposition, one that is going to make money, but, as a foundation for a type of people that will carry on the ideals of this Nation. It is a mode of living, and my observation is that on the average projects just three kinds of people are going on them—the rich man who has made his and wants to go back on the land to get this mode of living; he does not care for profits. The other man is the intelligent tenant farmer who never purchases land; and the other fellow is the man who has been referred to here as the foolish man who has made a failure elsewhere. Those are the three types who are going on to the farm. The farmer who is already there desires to live and bring up his family under that sort of environment. That is the observation that we have found all over this whole country.

NEW DAY FOR RECLAMATION

So far as reclamation is concerned, I believe we can go forward. We have taken stock of our situation and we have to face it. In my opinion, there will be a 15 per cent loss that should be written off on this experiment. That is a small percentage. You have had figures presented in other activities. You don't hear about those, but this big experiment seems to have been put aside by itself. I believe that if the recommendations now being presented to the Congress by the Secretary of the Interior and the Commissioner of Reclamation are put into effect that there will be a new day in reclamation. If we take the position that reclamation in its entirety (and I look upon it as a national proposition) is something for the welfare of this Nation, just like the Federal aids of Forest Service or harbors and rivers where you are creating something where nothing existed before, and that it is for the advantage of this Nation looking not to to-day, nor yesterday, nor in a direction of economy, but looking forward to 10, 15, 20, or 50 years from now, why, then, it will live.

I am hopeful that if we meet here a year from now something will have been accomplished to the end that our settlement program will go forward, that reclamation, both West and South, may have a new birth. [Prolonged applause.]

RURAL ECONOMICS IN PALESTINE

DOCTOR MEAD received recently an exceedingly interesting bulletin on "The transition from primitive to modern agriculture in Palestine," written by I. Elazari-Volkani, director of the Zionist Agricultural Experiment Station, and one of the former pupils of Doctor Mead at the University of California. Just prior to his return to the United States to take up his work on the Fact Finding Commission and later to become Commissioner of the Bureau of Reclamation, it will be recalled that Doctor Mead spent considerable time in Palestine as a consultant in connection with the Zionist movement, the rehabilitation of agriculture, and planned rural development in that country.

Excellent philosophy and good common sense characterize Mr. Volkani's contribution to rural economics. A few scattered examples must suffice:

"In no place and in no country is the path of the agriculturist strewn with roses. Rather is it full of pitfalls."

"We must always keep before our eyes as our objective a national economic system which can serve as the basis for a large settlement, not the success of isolated farms."

"One thing is clear; that if the earth does not yield its produce, and the cows do not give milk, and the fowls do not lay eggs, then all our new experiments in colonization will fail as the old ones failed."

"From empty udders it is impossible to extract milk, even if there is a separate drawer for each teat; and from impoverished land crops can not be produced, even if the pressure of the population is doubled, trebled, or quadrupled."

Included in the bulletin are a number of tables. One of the most interesting to those who have followed in this country the discussions concerning the cost of equipping a new farm shows the cost of equipment for 25 acres of diversified farming in Palestine, and is reproduced here for the year 1925.

Cost of equipment for 25 acres of diversified farming in Palestine

	1925
Dwelling, two rooms 26 by 13 feet	$875.00
Horse and cow barn 24½ by 13 feet	550.00
Poultry flock house	75.00
Barn for implements and grain	150.00
Planning	50.00
Fencing home garden and farmyard	50.00
Pipes for water installation	50.00
1 mule	150.00
2 cows	250.00
25 chickens	25.00
Beehives	25.00
Harness	20.00
One-half of a wagon	75.00
One-half of a plow No. 7	15.00
1 local light plow	5.00
One-fifth of a harvester with platform	35.00
One-tenth of a mower	12.50
One-tenth of a rake	6.00
One-fourth of a heavy harrow	6.25
One-fourth of a light harrow	5.00
Small tools	50.00
Manure and fertilizer	100.00
Seedlings	100.00
Seed	75.00
Community plantations	25.00
Part in the community bull	25.00
Part in the threshing machine and tractor	100.00
Part in the hay hopper and grain crusher	5.00
Blacksmith outfit	7.50
Feed for cattle	200.00
Food for settler, first year	210.00
Oil for deep plowing	50.00
Unforseen expenses	122.75
Total equipment	3,500.00

The family living from the farm lends safety and stability to the farm business and to farm life. It enables the farmer to reduce materially the cash cost of living and to tide over lean years and hard times that would be ruinous if he had to buy all the living for himself and family on the market.

Crops may be harvested by livestock economically when the quantity trampled down and the injury to the soil does not exceed the cost of harvesting by hand.

THE WATER REQUIREMENT OF PEARS

The usable water capacity of a soil and the concentration of the soil solution, particularly the nitrate content of orchard soils, are of commanding importance as affecting water requirement

By Prof. W. L. Powers, Oregon Agricultural College

A KNOWLEDGE of soil, plant, and water relations is needed to utilize wisely the natural productive resources of the West in efficient production of foodstuffs for the benefit of all the people.

Water is a daily need of every living thing. It gives high productive value to arid soil of good quality. The amount of water required by crops affects the cost and feasibility of proposed reclamation projects. Frequently in the western States the productive area is limited not by the amount of good soil but by the water available. If we could save half the water now used in irrigation it would almost be possible to double the productive irrigated area permanently. Prevention of waste of water should be a chief object of the irrigator, not only for the sake of economy but for the good of the orchard as well.

SECURING HIGH EFFICIENCY OF WATER IN ORCHARDS

To secure high efficiency, or economic use of water in an orchard, ample spacing of trees should be provided. Adequate thinning of the fruit must be performed. Excessive wood growth and leaf growth is controlled by avoiding a high-moisture content early in the season. This may result in demanding moisture that the fruit may need later in the season. The leaves will transpire an excessive amount of water and may deprive the fruit of light. Lewis, Kraus, and Rees found that heavy irrigation or a high moisture content and the resulting leaf growth made pear trees more susceptible to blight.

COVER CROPS AND TRANSPIRATION

Cover crops greatly increase the water requirement in an orchard if maintained on the land during the growing season. Such crops will tend to take up available nitrates or compete with the fruit trees for these and other nutrients. Sowing a fall cover crop may remove usable moisture from the soil and aid ripening of wood growth for winter. An exceedingly dry soil at the beginning of the winter season is inadvisable. Some suggest a light dormant irrigation after the fruit has matured. This would be useful in starting the cover crop. Where water is scarce and valuable only winter cover crops may be practicable. Hairy vetch or Hungarian vetch are suitable. The former has perhaps a slight advantage as to hardiness. If the water supply will permit growing the shade crops alfalfa or sweet clover can be used. If the growth is clipped or allowed to lodge a mat should accumulate and in time nitrates should accumulate so that no depressing effect from the shade crops would be experienced with the trees. Irrigation and the use of alfalfa intercrop on the Medford soil-experiment field (or Bernst tract) over a period of years has caused marked improvement in the pear trees, even though the early growth was harvested for hay. The water requirement of an orchard when intercropped will be about twice as great. With an alfalfa intercrop it will be as great as though a solid meadow were maintained. Sixteen years' studies of water requirement with alfalfa by Oregon Experiment Station indicate the crop-producing power is not likely to be less than 5 inches of water per ton.

FERTILITY IN RELATION TO TRANSPIRATION

The relation of fertility to water requirement is important. It was formerly said "The richer the soup the less required." A better explanation is that the more concentrated the soil solution the less is the absorption of particles of water in proportion to needed nutrients. (With a high concentration of salt in the soil solution, as in alkaline lands, there may be no absorption of water, or exosmosis may occur.) Supplying any needed nutrients results in a lower water cost. Nitrates will frequently be the limiting or most needed element with pears or other fruits. As far as conditions permit, nitrates should be secured from the growth and decay of legumes or nitrogenous organic manures. Application of barnyard manure to certain acres of the adobe soil on the Bernst tract has greatly improved soil conditions under the pear trees. The soil has improved in absorptiveness and retention of moisture and the fruit produced on manured areas has been of excellent quality.

GRAIN STRAW MUST BE USED WITH CAUTION

Grain straw and like organic refuse may render a soil more mellow or too loose if applied in excess, but the depressing effect of grain straw is largely due to the decomposition organisms competing with the growing fruit for available nitrates in the soil. Experiments have been under way for a year at the Oregon station wherein composts of grain straw treated with ammonium sulphate and with moisture and reaction control are giving promising results as a method of balancing the nitrogen-carbon ratio, and for reducing straw quickly to a condition like rotted manure. Soluble nitrates can be promptly applied to a tree with the aid of irrigation, which will carry them promptly into solution and to the roots.

A 3-year-old pear orchard on the Rio Grande project, New Mexico-Texas

TIME, AMOUNT, AND FREQUENCY OF IRRIGATION

The amount of irrigation per season is dependent upon the time, amount, and frequency of irrigations. In dealing with these factors it is fundamental to keep in mind that the amount of irrigation desirable is that which will replenish the soil up to its usable capacity for moisture throughout the root zone. The time should be such as will maintain a moderate, uniform moisture content throughout the the growing season, be largely marketed in the fruit, or used out of the soil so that good shipping quality of fruit will be secured at harvest time. It is also fundamental to keep in mind that any plant requires a maximum amount of moisture when it is setting and filling its fruit, whether it is a common species of the orchard, garden, or field.

The light dormant irrigation is good economy where only flood water is available. A little usable moisture, unless provided by precipitation, should be supplied to aid nitrification and solution of plant food throughout the winter season. Some usable moisture in the dormant season will favor root growth, as was long ago shown by McClatchie in Arizona experiments. Irrigation may be withheld in the spring to good advantage until the soil warms up, and only a moderate amount of moisture supplied early in the season, as excess water then will generally make extensive leaf growth, which may come at the expense of root development or fruiting. Pruning reduces and nitrate fertilizer increases the leaf area in relation to the roots.

IRRIGATION IN RELATION TO FRUITFULNESS

Cover crops on young orchards may help young trees hold down the size of fruit and the leaf development. The lack of moisture was found by A. F. Barss to result in less fruit bud formation and less fruit. Moderate supplemental irrigation gives brighter color, smoother fruit, and larger yield.

Chandler says: "It is probably better for a normal growth of fruit if there is in the soil enough water for good, though not excessive, development of the tree and the steady growth of the fruit," and that "high transpiration and lack of moisture may increase the 'drop' of young fruit." Irrigation four to six weeks before picking will be most effective in sizing up fruit, while late irrigation may injure the skin or shipping quality.

Jones and Colver studied irrigated and unirrigated fruits in Idaho and found that the unirrigated fruit was slightly higher in sugar, acid, and in some instances insoluble in water. This would indicate that late irrigation would reduce the quality of pears. According to Gardner "either excess or deficiency of soil moisture is likely to be accompanied by disturbed conditions within the plant." Excess may encourage splitting, chlorosis, and soft or water-cored fruit. A deficiency may favor premature defoliation and ripening and be followed by decreased vitality and die-back. Bennett finds the osmotic concentration of leaf sap higher than pear sap, and the pressure test used by the Oregon station to determine timeliness of picking has indicated removal of moisture from fruit with a resultant increase in resistance in some cases. This may tend to prevent ill effects from irrigation near picking time.

Time and amount of irrigation will vary with the weather conditions, water capacity of the soil, as well as the demands of the growing crop.

PEAR ORCHARD IRRIGATION STUDIES IN 1925

The Oregon Experiment Station is cooperating with the United States Department of Agriculture, Bureau of Rural Engineering, in irrigation studies on coarse "grayitic" and heavy adobe soils of Rogue River Valley with Charles Hartmann, jr., in charge of the field trials.

Experiments this past season on clay soils east and south of Medford show that the soil that is allowed to become too dry before irrigation resists wetting. By following irrigation with a second irrigation after two or three days it was possible to store a fair amount of water in rather heavy soils, the resistance to wetting having been overcome by the first irrigation. A ¾-inch opening proved best on sloping climax clay adobes with runs of 400 and 600 feet long. A run of 1,320 feet did not prove too long on the flat adobe soils just south of Medford. A pipe of 1½ inches diameter feeding water into a deep, rough furrow proved suitable. It was found difficult to store more than 2 or three inches irrigation in this soil or to secure penetration of more than 2 feet. Four to six furrows should be used between the tree rows. Few active roots can be expected in dry soil where the moisture does not penetrate. The use of manure, vetch, sweet clover, and ammonium sulphate is being studied to aid in improving penetration of irrigation water on this soil. Two irrigations of 2 to 4 inches, the first late in June, the second late in July, appear to be a good practice for the heavier soils of the valley. In the lighter soils light, frequent irrigations and a total of 6 to 12 inches may be required. Good orchard soil management and economic use of water go hand in hand.

GOOD FARMING ON YAKIMA PROJECT

SATISFACTORY returns from diversified farming were obtained last summer by Thomas McLain and son, of Outlook, Wash., on the Sunnyside division of the Yakima project, from 80 acres of land which they own and operate. Sixty-eight and one-half acres are cultivated; 3 acres are used for two dwelling houses, with yards, corrals, and gardens, and 2½ acres for pasture, with 6 acres of waste land.

Alfalfa, corn, and potatoes were raised, with the following results:

53 acres alfalfa, at 4½ tons per acre, 238 tons, at $15 per ton	$3,750.00	
Cutting, at $1 per ton	$238.00	
Baling, at $2.50 per ton	595.00	
	833.00	
		$2,917.00
8 acres corn, at 58 bushels per acre, 464 bushels at 87½ cents per bushel		406.00
7½ acres potatoes, at 11½ tons per acre, 86¼ tons, at $38	3,577.50	
Seed, at $20 per acre	$150.00	
Digging, at $2 per ton	172.50	
Sacks, at $1.50 per ton	129.38	
	451.88	
		3,125.62
2½ acres pasture; 4 head stock pastured 5 months, at $3 per head per month		60.00
71 acres, at $91.67 per acre		6,508.62

The corn ground was plowed, harrowed, and irrigated three times and cultivated five times.

The potatoes were planted on alfalfa land which had been disked twice and harrowed once, then drained, ploughed and harrowed four times. After planting, the potatoes were cultivated six times and irrigated ten.

All of the hay land was harrowed once, part of it twice, and irrigated three and four times, three cuttings being obtained.

Five head of horses are used in their farming operations; a few cows bring in a small income each month, as well as adding to the fertility of the soil, and about 175 Rhode Island Red chickens net a fair profit for the labor and feed.

Every livestock feeder should make a study of conditions on his farm with the idea of feeding such products as are being wasted.

The wise feeder soon learns that the proper use of all farm by-products, waste, and surplus crops for livestock feed often constitutes the main difference between profit and loss in feeding.

APPLE PRODUCTION ON THE OKANOGAN PROJECT

The experience of John S. Petersen, described below, indicates clearly what can be accomplished through perseverance and by following approved methods in planting and caring for his orchard

By Calvin Casteel, Superintendent

Farm home of John S. Petersen, Omak, Washington, on the Okanogan project

IN 1902 John S. Petersen settled on a homestead of 160 acres on Pogue Flat with the thought that this land, along with other lands being settled on about the same time, would come under irrigation by the united efforts of the settlers. In fact, work was started that year to build a feeder canal from Salmon Creek to Brown Lake, a matter of 4 or 5 miles, part of the distance being heavy construction. From Brown Lake a short canal of a few miles and a distribution system would have put the water on the land. The reclamation act was passed in the same year, and one of the settlers, reading about it, solicited the Government to make an examination of the possibilities of a project.

Mr. Petersen started in with a very modest house at first and has built on and added to it until he now has a very comfortable home. It is quite modern and up to date. His radio keeps in touch with the markets and furnishes entertainment to all.

In 1903 the first surveys were made of the Okanogan project, and in about three years the project was approved and construction completed in 1910. Water was available for Mr. Petersen's land in 1909.

In the spring of 1909 he planted 5 acres, which had been previously cleared and prepared, to orchard, principally apple trees. The next year he planted 10 acres to orchard. The following year he planted 10 acres of his nonirrigable land, lying adjacent to and above the upper main lateral, to orchard, and in 1912 he planted 5 more of his nonirrigable land to orchard. He then had 15 acres of orchard on irrigable land and 15 acres on nonirrigable land. The latter area was kept growing by securing a little water from Brown Lake, a few miles away, and by intensive cultivation. In 1918 he secured 14 acres of project water right, by transfer from a worthless sandy tract, which he has since pumped onto this area from the upper main lateral, the lift being about 30 feet.

PLANTING THE ORCHARD

In planting all the orchard he used extreme care. A hole 4 by 6 by 2 feet deep was dug; the top soil was put back into the hole first, and then the tree placed in it so that the roots were in no wise cramped. The growth secured on the trees the first few years seemed to justify the effort. To see the orchard now one would not believe it was ever very rocky, but Mr. Petersen says that almost a load of rocks was dug out of many of the holes. In planting this way, with one man helping, only about 25 trees per day were planted, while it is the usual thing to plant from four to six times as many.

Like most homesteaders, he did not have an abundance of cash and did some outside work while waiting for the water, but with the water available began growing crops between the trees. The crops grown were potatoes, tomatoes, corn, cabbage, and strawberries. Tomatoes were the most successful financially. The marketing of these crops was a problem. There was no railroad, wagon roads were merely trails, and only horses could be used for distances of 30 to 60 miles to shipping points or markets. A living was made by this cropping between the trees until his orchard came into bearing.

Mr. Petersen has always used considerable barnyard manure on his orchard, and of late years some commercial fertilizer, and has had alfalfa between the trees as a cover crop for the past several years.

Mr. Petersen has found it necessary to supplement his gravity supply of water during years of a short supply by pumping some from a small lake (Duck Lake) near his place and by pumping from a well on his place. In this way he has had ample water to keep his trees in a good and healthy condition but at a high per acre cost.

In order that an average crop may be grown each year, careful thinning is done. With a heavy load on the trees the apples are thinned out so that they are 8 to 12 inches apart. This distance apart is less when the trees are not so heavily loaded.

GOOD CROPS EVERY YEAR

His place came into bearing about 1916, and in 1918 produced a good crop, and since that time has been fairly constant in yielding a good crop each year. There has been generally an increase in production each year. This year his production amounted to about 500 boxes per acre, with one block of Delicious trees producing 1,750 boxes of apples per acre, or an average yield of 35 packed boxes per tree.

To determine when it is time to irrigate, the ground is tested by digging with a shovel and inspecting the condition of the subsoil.

The spraying of his trees and fruit, to combat the numerous pests that are always attempting to defeat the purposes of all orchardists, is done very carefully. As an example, he puts on two calyx sprays, when one is the general rule. The purpose of this is to spray all blossoms as nearly as possible at the right time. Not all blossoms come out at the same time. The advice of the expert horticulturist employed by the State is followed closely as to time and manner of spraying.

(Continued on page 52)

A SUCCESSFUL APPLE ORCHARDIST

Okanogan Project, Wash.

By Calvin Casteel, Superintendent

THAT it is not always size that counts is as true of orchards as it is of many other things. This is proven by a number of small orchards on the Okanogan project, and particularly by that of Howard Benjamin, who owns and grows apples on one of 6 acres.

Mr. Benjamin came to the project in the fall of 1910 with $400 and an ambition to grow apples. He bought a 6-acre tract which had been planted to trees the spring of that year. He used all of his capital in making his first payment and took up the burden of the balance of the purchase price of $1,800 in deferred payments, with interest.

In 1911 he planted fillers between all of his original or permanent trees. These have been gradually taken out until now there are only a few left. Mr. Benjamin claims that by fertilizing heavily he has made them pay, but his case is somewhat exceptional in this respect. However, knowing him, one could expect it.

OKANOGAN PROJECT APPLE PRODUCTION

(Continued from page 52)

Mr. Petersen's crop for the past several years has been fairly constant as to amount; in fact, so much so that it seems evident that proper irrigation, careful spraying, and drastic thinning of fruit pay well.

Mr. Petersen has a fair sized family, five boys and one girl. Three of the boys are now old enough to help on the farm and he and they do most all of the work except during the rush seasons. The two oldest boys have each purchased 10 acres of land and have planted it all to orchard. With this size of a family, and all at home and working as they become old enough, 40 to 50 acres of orchard is about the right size.

Mr. Petersen is a very enthusiastic apple grower. He believes that there is a bright future ahead for the industry in sections where a high-class product can be grown and a fairly constant yield be secured each year. He says that the market has expanded very rapidly in the past few years, and the acreage growing apples is decreasing from year to year. He is interested in one of the warehousing concerns at Omak, Wash., and is no doubt in a position to be informed on these matters.

For a time after buying the orchard he lived and batched in a small house with the man he bought from. He secured work as soon as possible. He continued to work out for his neighbors or for the Government on canal work until his orchard came into bearing.

His first unpretentious home was built during his second year on the place. He was able to secure a carpenter to do the woodwork, but found it necessary to put in the concrete foundation himself by lantern light after doing a day's work elsewhere.

SMALL ACREAGE BEST

Mr. Benjamin does not have any new or novel ideas about fruit raising, but believes that one man with 5 or 6 acres has all that he can do caring for it, and even then it is necessary to hire some help during the harvest season and for thinning. For the first few years he hauled a large amount of manure to his land, and of course still continues to use some. His ground was clean cultivated for the first five years, and it was then seeded to alfalfa. Since the orchard has come into bearing he uses ½ a ton of nitrate each year and not less than 20 tons of manure.

When the first year of water shortage came along he was one of the first to dig a well to be used for irrigation. With this well Mr. Benjamin has had all the water that he has wanted during the past several short years. Part of the time he has used his portion of the project supply. The cost of his well and machinery has amounted to $1,000, and the operation of it has cost him $500, making $250 per acre which he has paid in eight years, besides paying all project assessments but one and taxes assessed when due. He believes confidently that it has paid him to make this effort.

He was married in 1919, and in 1921 built a very nice and comfortable home. Mrs. Benjamin is very much interested in the orcharding problems and helps out a great deal at times when extra help must be had.

Mr. Benjamin's crop for this year amounted to more than 3,400 boxes of apples. In harvesting this crop only the picking was done by hired help. Mr. Benjamin did the hauling and packing and Mrs. Benjamin and her daughter did the sorting. The items of sorting, packing, and lidding of boxes saved them over $500 alone. This handling of his own crop was made possible by building a small but good and modern storehouse on the farm. This building is not large, but is big enough to hold the entire crop of winesaps. This gives him all that is necessary in the way of storage to pack out all of his own crop, as all of the earlier varieties of apples are packed out and hauled to the railroad before the freezing weather comes.

Mr. Benjamin follows pretty closely the advice of horticultural experts in the handling of his orchard. He believes that constant attention to business and enough water for irrigation are the essentials, and that an apple orchard in the Okanogan country can be made to yield good returns if the water and labor are properly applied.

Mr. Benjamin's experience would prove that 5 to 10 acres is a large enough orchard for one man to handle. This can also be proven by a number of others with small tracts on the project. He is enthusiastic about the growing of apples and believes that nearly any price can be paid for water if an ample supply is secured. His success and experience so far have borne out this statement.

IRRIGATION PROJECT APPROVED IN INDIA

Assistant Trade Commissioner Donald Renshaw, of Bombay, India, as reported in a recent issue of Commerce Reports states that an irrigation project in the Madras Presidency has received the approval of the local legislature, and the Government of Madras is anxious that it should be undertaken without delay.

The project has two main objects: To improve the existing fluctuating water supplies for the present delta irrigation of more than 1,000,000 acres, and to extend irrigation to 301,000 acres of land now irrigated. The undertaking involves: (1) The construction of a large masonry dam on the Cauvery at Metur, which will form a reservoir with an effective capacity of 2,066,000 acre-feet. The object of this dam is to store the flood waters of the river, passing them down to the delta as required. (2) The construction of a main irrigation canal about 88 miles in length, with a connected distributary system, having its offtake on the right bank of the Cauvery, upstream from the existing Grand Anicut. This proposed work has been designated the Grand Anicut Canal. (3) The improvement and extension of the existing Vadavar Canal in the Cauvery delta. The intention of the Madras Government is to finance the project by loans raised in the open market, supplemented, if necessary, by loans from the Government of India.

HUGE CONSTRUCTION PROGRAM OF RECLAMATION BUREAU

The Government is expending approximately $25,000,000 on new construction of dams, canals, and irrigation works on 12 reclamation projects

THE work now being conducted by the Bureau of Reclamation is the largest that has been undertaken since the original major projects were built. Included in the construction being prosecuted are three large dams—the McKay Dam on the Umatilla project in Oregon, the American Falls Dam on the Snake River in Idaho, and the Guernsey Dam on the North Platte River in Wyoming. Extensive drainage and canal construction work is also under way on other Government irrigation projects.

In addition to the building of these dams and major works, expenditures are being made by the Reclamation Bureau for construction on the Yuma project in Arizona, Grand Valley project in Colorado, Boise project in Idaho, North Platte project in Nebraska-Wyoming, Carlsbad project in New Mexico, Klamath project in Oregon, Yakima project in Washington, Riverton and Shoshone projects in Wyoming.

LARGE DAM CONSTRUCTION

The McKay Dam, located on a creek of that name about 8 miles south of Pendleton, Oreg., is nearing completion. It is an earth and gravel fill storage dam, having a maximum height of 160 feet, length of about half a mile, and a volume of two and one-third million cubic yards of material. During the past year 350 to 400 men have been employed on this work. The dam was commenced in 1923 and is nearly completed. It will form a reservoir having an area of 1,600 acres, a capacity of 75,000 acre feet, which will be used as a supplemental supply for the irrigation of 30,000 acres of land in the vicinity of the present Umatilla project. The cost of the dam will total $2,250,000.

The American Falls Dam is being built across Snake River at American Falls, Idaho, in cooperation with irrigation districts and companies in Snake River Valley. Work was begun on the dam in February, 1925, and, according to the contract with the Utah Construction Co., must be completed by June 30, 1927.

The dam will be almost exactly a mile long and at its highest point about 85 feet high. That part of it across the river and for a considerable distance east of the river is of solid massive concrete with an earth embankment at either end. When completed the dam will contain about 160,000 cubic yards of concrete, 1,255,000 pounds of reinforcing steel, and 2,256,000 pounds of structural steel, operating gates, etc. A roadway will lead across the top of dam.

The reservoir which the dam will create will have a capacity of 1,700,000 acre-feet, covering an area of 56,000 acres. This will be the second largest reservoir built by the Bureau of Reclamation. It will furnish a total or partial water supply to some 750,000 acres of land, most of which is now in a high state of cultivation.

Water will be discharged through the dam by means of 20 gates each 5 feet square. In addition, 2 penstocks, each 15 feet in diameter, will furnish water to the Idaho Power Co.'s plant situated below the dam on the east bank of the river, and four penstocks of the same size will supply water to a proposed plant to be built by the United States on the west bank of the river, with a probable capacity of 40,000 horsepower.

About 2 miles of the main line of the Oregon Short Line Railroad, including depot, grounds, sidings, switches, etc., will be flooded and have been moved to higher ground. The company's bridge across Snake River has been raised nearly 22 feet, this work being done without interruption to traffic.

As about three-fourths of the old town of American Falls will be submerged, a new town site has been laid out above the reservoir to which the buildings in the old town have been moved. Streets in the new location have been graded and graveled, sidewalks and sewer and water systems built, trees planted, parks laid out, etc. A large new high school building, a new courthouse, and numerous business buildings have been erected.

Irrigation projects and districts have advanced more than $3,000,000 toward the construction of the dam. The entire cost of the development will amount to $8,000,000.

The Guernsey Dam, construction of which has recently been commenced by the Utah Construction Co., is located in a narrow canyon 2 miles above the town of Guernsey, Wyo., on the North Platte River. The dam will be an earth and rockfill structure 97 feet high, 575 feet long, having a volume of 332,000 cubic yards, and will form a reservoir having an area of 2,336 acres and a capacity of 72,700 acre-feet for the irrigation of lands on the North Platte project in the States of Wyoming and Nebraska. A power plant with a capacity of 2,500 kilowatts will be constructed in connection with the dam and the total cost of the dam and power development is estimated at more than $2,500,000. The entire contract is about one-third completed.

OTHER IMPORTANT CONSTRUCTION

On the Yuma project a 1,200-horsepower hydroelectric plant is under con-

General view of river section of American Falls Dam from east end of railroad bridge

struction at a drop in the California main canal. This plant will cost about $250,000, and will furnish power for pumping water to the Mesa division lands in Arizona. The foundation of the plant has been completed and the contractor has commenced the erection of the powerhouse.

Construction work is in progress on a number of other irrigation projects, as follows:

On the Grand Valley project, Colorado, a siphon spillway is being constructed at the Orchard Mesa pumping plant, and excavation is also being carried on with drag lines at a number of points in connection with drainage work at a cost of $200,000.

On the Boise project, Idaho, riprap is being placed for the bank protection and a concrete parapet is being constructed on the main canal in order to increase its capacity, the cost being $278,000.

On the North Platte project the enlargement of the Interstate Canal is in progress and the construction of the Laramie River diversion canal is under way at a cost of $465,000.

On the Carlsbad project, New Mexico, concrete lining of the main canal is in progress, and on the Rio Grande project, in the same State, several drag-line excavators are being utilized in the construction of drains, levees, and canals, the total cost being $1,016,830.

On the Klamath project, Oregon, enlargement of a number of canals is in progress at a cost of $58,700.

On the Yakima project, Washington, canals are being lined with concrete on the Tieton division, and a wasteway is being reconstructed on the Sunnyside division, the cost being $65,000. On the Kittitas division rights of way for 27 miles of the main canal are being purchased and specifications are being prepared for the early letting of contracts that will involve an estimated expenditure of $7,500,000.

On the Riverton project, Wyoming, construction of the Pilot Butte Dam embankments is in progress, together with some lateral excavations. The Pilot Butte Dam embankment will be 42 feet high, 2,400 feet long, and contain 200,000 cubic yards of material. Its cost will total $189,000.

On the Shoshone project, Wyoming, contract work is in progress on the Willwood division for the construction of canal and laterals at a cost of $290,000.

An average of 2,500 horsepower-hours is utilized on each farm, of which about 80 per cent is used directly for the production and marketing of crops and the remainder for miscellaneous tasks.

LAND REFORM IN FINLAND

Land reform in Finland was started in 1918 by an act which allowed the tenant to acquire the holding he was occupying. In 1922 an act was passed which defines an agricultural holding as a property large enough for one family to cultivate by means of its own labor, but not exceeding 60 acres. Such units may be allotted to landless persons. For this purpose land is acquired by the State through purchase or, under certain conditions, by expropriation.

As the purpose of the act is primarily to encourage agricultural production, certain duties are laid on the new tenant. He must reside on his holding, and where no house exists build one within three years. He must prove that he has sufficient practical knowledge of agriculture and owns the necessary equipment, money, or credit for the running of his farm.

In the purchase of property for settlement, the State pays the original owner the value of the crops, salable timber, and buildings, in addition to the price of the land, up to a maximum of 5,000 marks in cash, the rest being allotted in State bonds carrying 7 per cent interest. The settler has to refund an equal amount to the State, either in cash or in early payments of 7 to 9 per cent, of which 7 per cent counts as interest and the remainder for amortization.

It has been demonstrated in practice that if farmers generally would pay wages on the basis of efficiency they could attract a more desirable class of help.

REPORT OF RECLAMATION COMMITTEE OF AMERICAN ENGINEERING COUNCIL

RECLAMATION has been an important factor in the development of the agricultural resources of the United States. Hence, there is a real need for the continuation of a reasonably fixed policy of reclamation. The policy should be such as to be adjusted to the changing economic requirements of the nation.

The reclamation policy should embody the principle that any project must justify the cost of construction and maintenance by either direct or indirect returns or both, and those sharing in the benefits, whether bona fide occupants of the land, the national Government or political subdivisions thereof, shall bear the entire cost thereof in proportion to the respective benefits obtained.

The Federal reclamation policies of the past have held closely to the principle that the land should bear the entire cost of reclamation without reference to the ability of the land to meet such obligations. This has led to:

(a) Deferred payments;
(b) Reclassification of land;
(c) Federal supervision of land settlements;
(d) Probable writing off by the Government of many millions of unpaid accounts.

The future policy of Federal reclamation should embody the principle that previous to inaugurating any project there shall be ascertained:

(a) The producing capacity of the land;
(b) The ability of the land and the project to meet the cost of construction, operation, and maintenance;
(c) The practical occupation of the land by responsible settlers.

Your committee believes that the success of Federal reclamation depends upon a continuity of policy in the administration and enforcement of congressional acts relating thereto and that such administration and enforcement should be independent of direct political influence.

Since there is a wide divergence of opinion as to the most practical methods and policies to adopt with reference to reclamation, your committee therefore recommends:

That American Engineering Council have made under its direction a thorough and an impartial study of:

(a) The fundamental principles involved in a reasonably fixed policy of Federal reclamation;
(b) An administrative plan looking toward the creation of a Federal corporation, controlled by a small board of directors, authorized to administer and enforce congressional acts relating to reclamation;
(c) Development of a land settlement plan which may be practiced under such corporate administration

ORGANIZATION ACTIVITIES AND PROJECT VISITORS

GEORGE C. KREUTZER, Director of Reclamation Economics, is again in Washington, this time accompanied by his family, for an extended stay in connection with bureau policies.

District Counsel Alexander and William M. Green, engineer in charge of the Salt Lake Basin project, attended a meeting recently of the Utah Water Storage Commission at Salt Lake City, where matters were discussed concerning the expediting of the preliminary work on the project so that actual construction may be initiated.

Samuel Judd, assistant engineer in the Denver office, was in Kansas City recently inspecting reinforcing steel being furnished for McKay dam, Umatilla project. He returned by way of Omaha, where he inspected the 50 by 50 foot Stoney gates being furnished by the Omaha Steel Works.

Randolph E. Fishburn, consulting engineer, J. F. Schaffer, assistant engineer, of El Paso, and Armando Santacruz, consulting engineer, who are on the International Boundary Commission between the United States and Mexico, were on the Yuma project at the close of the month.

Superintendent Weber, of the Orland project, has been making trips to Sacramento and Berkeley in connection with Stony Creek water-right adjudication matters.

Assistant Engineer E. T. Eriksen Orland project, spent several days at the office of the district counsel at Berkeley on water-right adjudication and related subjects.

Supt. L. J. Foster and Engineer C. B. Elliott, of the Uncompahgre project, visited the Grand Valley project recently to inspect equipment available for transfer.

J. L. Savage, designing engineer from the Denver office, was on the Boise project for a few days to inspect the repair work on the spillway gates at Black Canyon Dam.

George W. Lyle, chief clerk on the King Hill project during the latter part of 1925, resumed his former position as bookkeeper at the Burley office, Minidoka project, when the King Hill project was taken over by the water users on January 1.

Senor Jose Nunez Casquete, an engineer from Spain, was a recent visitor at the American Falls and McKay Dams.

PROJECT DELEGATES VISIT WASHINGTON

A number of delegations from the projects have been in Washington, D. C., recently in connection with affairs on their respective projects, as follows:

Carlsbad project, New Mexico.—H. A. Kerr, president of the water users' association; Francis G. Tracy, vice president; J. H. Lewis, engineer; Judge G. A. Richardson, attorney; George Neal, State engineer of New Mexico; Keith Edwards, Fort Sumner irrigation district.

Belle Fourche project, South Dakota.—W. D. Buchholz, secretary Belle Fourche Irrigation District; R. L. Bronson, secretary of the Commercial Club; B. F. Myers, State secretary of agriculture.

North Platte project, Nebraska-Wyoming.—James T. Whitehead; William Morrow, attorney for the water users' association; A. N. Mathers, president Gering National Bank and representative of the Gering-Fort Laramie district; Dr. G. E. Condra, University of Nebraska, and personal representative of Governor McMullen.

Columbia Basin.—Hervey Lindley, president of the Columbia Basin League, Seattle; James R. Kyle, Stanfield, Oreg.; C. W. Hebbard, Spokane, Wash.

Miss Dorothy H. David, junior clerk, is a recent addition to the force on the Milk River project.

H. R. Prior, transitman, has been reinstated on the Sun River project.

E. R. Scheppelmann, chief clerk on the lower Yellowstone project, has been designated a fiscal agent.

Millard M. Smith, junior clerk on the North Platte project, has been transferred to the Yakima project.

L. N. McClellan, electrical engineer from the Denver office, has been on the North Platte project recently to consult on questions in connection with the operation of the power system.

S. O. Harper, general superintendent of construction, and J. L. Savage, designing engineer, from the Denver office, visited the North Platte project at the end of the month on matters relating to the construction of Guernsey Dam.

District Counsel Holgate held a conference on the Umatilla project with the directors of the irrigation districts relative to the proposed amendatory contracts under the act of December 5, 1924.

Ray E. Petit, a foreman for many years on the Belle Fourche project, resigned on January 31.

Robert C. Walber, chief clerk on the Belle Fourche project, has been designated a fiscal agent.

The general manager and engineer of the Puget Sound Bridge & Dredging Co. visited the Okanogan project recently for the purpose of looking over the ground and discussing with the board of directors of the irrigation district the matter of pumping from the Okanogan River into the project canals.

Brooks Fullerton, district counsel at Mitchell, Nebr., for the North Platte, Belle Fourche, and Riverton projects, has resigned from the bureau, effective March 1.

Following the practical completion of the Pilot Butte Dam, Riverton project, R. V. Sass, superintendent of construction, left the project en route for Denver and southern California by auto. Associate Engineer R. B. Diemer took charge of Government force work on January 11.

W. H. Knox, cost keeper on the Rio Grande project, has resigned and has been succeeded by M. W. Nichols, timekeeper.

H. W. Bashore, superintendent of the North Platte project, and P. J. Preston, superintendent of the Yuma project, have been in the Washington office recently in connection with project affairs.

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 — P. W. Dent, Assistant to the Commissioner — C. A. Bissell, Chief of Engineering Division

W. F. Kuhach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — 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; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; J. R. Ummel, Chief Clerk; Harry Caden, Fiscal Agent.

George C. Kreutzer, Director of Reclamation Economics; Andrew Weiss, Assistant Director of Reclamation Economics; B. E. Hayden, Industrial Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Younghlutt	R. C. Walher	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise	Boise, Idaho	J. B. Bond	E. R. Mills	C. F. Weinkauf	B. E. Stoutemyer	Boise, Idaho.
Carlsbad	Carlshad, N. Mex	L. E. Foster	V. L. Minter	V. L. Minter	Ottamar Hamele	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	A. R. McGinness	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill [1]	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	G. E. Stratton	E. E. Chabot		do	Do.
Minidoka	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Boise, Idaho.
Newlands	Fallon, Nev	J. F. Richardson	G. B. Snow	Miss E. M. Simmonds	R. J. Coffey	Berkeley, Calif.
North Platte	Mitchell, Nebr	H. W. Bashore	L. H. Mong	T. R. Pael	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	H. L. Holgate	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	V. E Huhbell	Wm. J. Burke	Mitchell, Nebr.
Salt River [2]	Phoenix, Ariz	C. C. Cragin [3]				
Shoshone	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley	Provo, Utah	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg	H. M. Schilling	C. M. Voyen	C. M. Voyen	H. L. Holgate	Portland, Oreg.
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunningham	J. C. Gawler	H. L. Holgate	Portland, Oreg
Yuma	Yuma, Ariz	P. J. Preston	M. J. Gorman	E. M. Philehaum	R. J. Coffey	Berkeley, Calif.

Large Construction Work

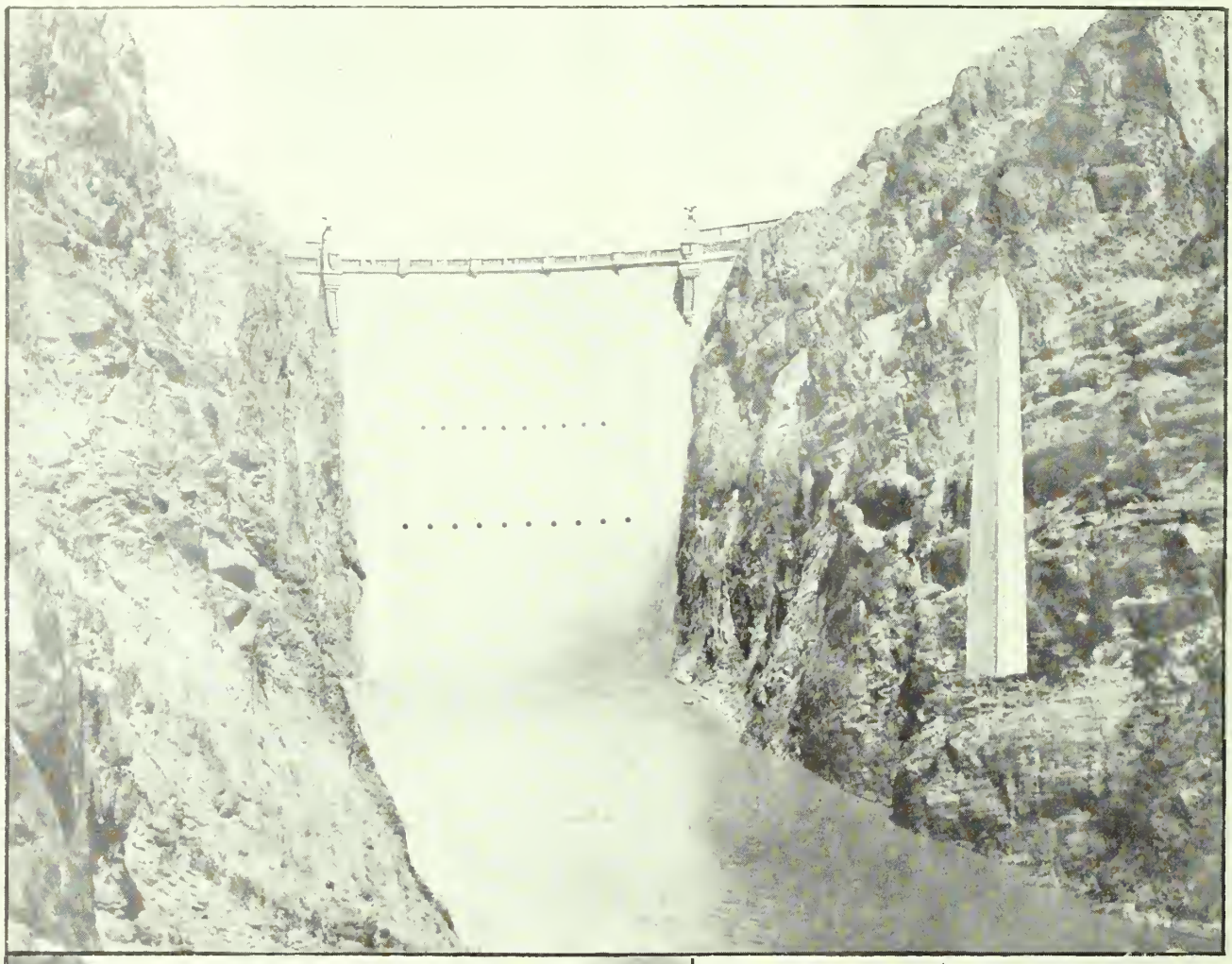
Minidoka, American Falls Dam.	American Falls, Idaho.	F. A. Banks [4]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Boise, Idaho.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [4]	Chas. Klingman	T. R. Pael		Mitchell, Nebr.
Umatilla, McKay Dam.	McKay Dam, Oreg	R. M. Conner [5] Ralph Lowry [4]	C B. Funk	W. S. Gillogly	H. L. Holgate	Portland, Oreg.

[1] Project operated by King Hill Irrigation district.
[2] Project operated by Salt River Valley Water Users' Association.
[3] General Superintendent and Chief Engineer.
[4] Resident Engineer.
[5] Construction Engineer.

Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Sacramento Valley	Berkeley, Calif	W. R. Young	Sacramento Valley Development Association and State of California.
Duhois	American Falls, Idaho	F. A Banks	Duhois Project Finance Association.
Milk River eastern tributaries	Hermiston, Oreg	E. R. Crocker	
No. 3 reservoir site, Pecos River	Carlshad, N. Mex	L. E. Foster	Carlsbad Water Users' Association.
Spanish Springs storage	Fernley, Nev	A. W. Walker	
Harney Valley	Boise, Idaho	J. B. Bond	
Owyhee	do	do	
Vale	do	do	
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	State of Utah.
Methow-Okanogan	Okanogan, Wash	Orrin C. Smith	Okanogan irrigation district.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.

The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others 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.



DAM SITE OF THE
PROPOSED BOULDER DAM
AND
VIEW OF FINISHED DAM
FROM DOWN STREAM
AND
WASHINGTON MONUMENT
FOR
COMPARISON OF HEIGHTS
MONUMENT 555 FEET
DAM 560 FEET
FROM RIVER LEVEL
TO CREST

I 27.5: 1926

NEW RECLAMATION ERA

VOL. 17 APRIL, 1926 NO. 4

TWO-YEAR OLD YUMA MESA GRAPEFRUIT TREE

CITRUS FRUIT GROWN ON THE FEDERAL IRRIGATION PROJECTS IN 1925 WAS VALUED AT NEARLY $1,000,000, OR $540.50 AN ACRE

Clemson Agricultural College
of South Carolina
Library

FEDERAL RECLAMATION

WHILE just at this time reclamation is almost synonymous with irrigation of arid lands, we do not lose sight of the fact that that word and the policy of the Government include reclamation by drainage of swamp lands, by development of cut-over timberlands, and by fertilization of exhausted farm lands all through the eastern part of the United States. All will be needed in time. Our national necessities will compel us to go forward all along the productive line.

Reclamation is not only a matter of producing food for our people. The great thing is the transformation of the wilderness to civilization. It is the occupation and cultivation by the capital and labor of the settler of the unoccupied lands of this country. It is the creation of taxable wealth to help sustain the Government for all future times. It is the establishment of homes. It is the strength of manhood and womanhood contributing to the safety and defense of the Nation. It is the addition to our population of a splendid, enlightened, industrious citizenship which will enhance and enrich the security, the order, the welfare of our common country.

—*From an address in the House of Representatives by Hon. Charles E. Winter, of Wyoming*

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. 17 APRIL, 1926 No. 4

High Lights on the Reclamation Projects

EARLY in April the bureau will open to entry 20 farm units on the Riverton project, Wyoming, under the new regulations providing for the selection of settlers on the basis of industry, experience, character, and capital. More details concerning the opening are given in another article in this issue.

THE farmers on the Fort Shaw division of the Sun River project recently shipped out 21 cars of alfalfa. It is to be regretted that an equivalent amount of stock was not shipped in to which this hay could have been fed.

THE work of placing the concrete lining of the diversion tunnel at Guernsey Dam, North Platte project, was completed on February 28. At the end of the month the dam was 39.9 per cent completed, based on contract earnings.

AT a recent public meeting of the dairy interests on the Newlands project the officials of the Mutual Creamery Co., owner of the local creamery, presented and explained a plan offering the plant and facilities of the company to the dairymen for operation under a cooperative arrangement. It is understood that the pledging of 2,500 cows under the plan will be necessary.

DURING the first two months of the year 190 cars of cotton and cottonseed were shipped from the Yuma project, valued at $633,000.

SETTLERS are now being selected on the basis of approved qualifications covering industry, experience, character, and capital. Among the first to qualify is a water user on the Sun River project and two on the Grand Valley project. In each case the entryman appears to be well qualified and should prove successful.

88534—26†

THE Grand Valley project reports that an increased spirit of optimism is apparent among most of the water users, and good results are anticipated. Development has been especially striking on the Orchard Mesa where one nursery has set out more than 30,000 peach trees. It is expected that approximately 2,000 acres of the east end of Orchard Mesa will be almost entirely set to peach orchards with excellent prospects of successful horticulture.

A PLOT of corn land, measuring 3.4 acres on the Sweitzer place on Garnet Mesa, Uncompahgre project, yielded 390 bushels of shelled corn, averaging 114 bushels per acre. This yield is believed to be the State record for 1925. The corn was well matured, uniform in type, and of a variety known as U. S. No. 133.

THE Ninth Annual Corn and Potato Show of the Uncompahgre project was held recently at Olathe, Colo. The display of exhibits was excellent, and many prizes of merchandise and other articles were presented by the various business firms of the three project towns. The show was particularly gratifying in view of the fact that approximately 800 people attended.

DURING February 424 cars of agricultural products were shipped from the Minidoka project, of which 250 were potatoes. Russets and Netted Gems were quoted at $2.65 and Rurals at $2.50 per hundredweight.

ON February 15 the Utah Construction Co. was notified to proceed with the construction of American Falls Dam to impound 1,700,000 acre-feet, within the limits of available funds. By the end of the month the foundation had been laid for nearly all of the structure that will be required to store 345,000 acre-feet this spring.

BIDS were opened on February 24 for the leasing of Tule Lake lands on the Klamath project. More than 300 bids were received, and 214 lots of 30,369 acres were leased for $29,012.90. After the contracts had been awarded those lots still open were offered at the minimum price of $40 a lot. At the end of the month 56 lots of 9,420 acres had been let for $2,240.

MASS meetings were held recently on the Okanogan project to consider the necessity and possibility of installing and operating a pumping plant to pump water from the Okanogan River into the project canals or to pay the Puget Sound Bridge & Dredge Co. for the pumping. The snowfall and precipitation during the first half of February, however, caused the water users to take an optimistic view of the water situation and they decided not to undertake either plan.

THERE has been a considerable increase in payments by the water users on the Yakima project over those of a year ago. On the Tieton division the collections for February were $17,547.08 compared with $11,202.78 for the same month in 1925.

DEEDS have been secured by the Kittitas reclamation district for practically all the right of way needed for the first four miles of the main canal, planned for immediate construction.

IN consequence of the minimum price of $8.50 a ton for sugar beets on the Shoshone project, which the sugar company is offering in its 1926 contract, there is considerable interest in the crop. About a dozen families of German-Russian beet farmers have moved to the Garland division and expect to contract for 500 acres. It is expected that 2,800 acres will be contracted compared with 1,700 in 1925.

The Economic Development of the Colorado River

A radio talk from Station NAA, the Naval Radio Station at Arlington, Va., on February 20, discussing the economic value of the project from a national standpoint, including irrigation, flood protection, and power development

By Dr. Elwood Mead, Commissioner of Reclamation

THE Colorado is one of the large and interesting rivers of the arid region. It is the only one where the valleys are all arid, and where permanent agrieulture depends on ability to use water in irrigation. The river has therefore great economic value. Seven States are interested in its division and in works to make its water available. Two great cities. Denver in the Rocky Mountain area and Los Angeles on the Pacific coast, must go to this river for additional water needed for household and industrial uses. Both of these eities are outside the stream's drainage. It takes a long tunnel through the mountains to supply Denver and a 300-mile pipe line to carry it to Los Angeles. The river now irrigates 2,000,000 acres of land once desert. It can be made to irrigate 6,000,000 acres. It now generates electric energy to light a few towns and operate a few mines. It can be made to generate 6,000,000 horsepower.

A bill is now before Congress which, if it becomes a law, will provide $125,000,000 to build works to make available all the water of the lower third of the river. Under it the United States Bureau of Reclamation of the Interior Department would be given the task of building some of the greatest engineering structures of the world, needed to harness the stream. The Nation will secure thereby social and economic results that will mark it as one of the greatest constructive achievements of the century.

THE HUGE DAM

The plans for this development include three great structures. The first is a dam across the channel of the river, which from its foundation to its crest will be over 700 feet high, and it will raise the water surface of the river 550 feet. It will not only be the highest dam in the world, but will be more than twice as high as any dam ever built in any country. The highest dam now in existence is the Arrowrock in Idaho, built by the United States Reclamation Bureau, which is 349 feet high. The highest in any other country is the Camarasa Dam in Spain, which is 335 feet high. This dam will loom, therefore, among other dams as the Eiffel Tower does among structures of its class.

This dam will create a reservoir to regulate the flow of the river. The reservoir will be 86 miles long, and hold enough water to cover 26,000,000 acres of land a foot deep, or enough to cover the States of New Hampshire, Vermont, Massachusetts, Connecticut, New Jersey, and the District of Columbia to that depth.

The average flow of the river for a whole calendar year is about 16,000,000 acre-feet. This lake will hold, therefore, the entire discharge of the river for a year and a half. The great floods which now come down in the spring when the snows are melting will be caught here and held back, to be released later when water is needed to irrigate parched fields. No water will flow over the dam. All that goes down the stream will be let out through its regulating gates which will open into tunnels which pass around the end of the dam and will be cut through the towering eliffs between which the dam will be built.

THE ALL-AMERICAN CANAL

The second important feature of this development is what is called the All-American Canal. It would start at the western end of the Laguna Dam, a diversion dam in the Colorado, built about 20 years ago by the United States Reclamation Bureau. It is located about 30 miles from where the Colorado River crosses the international boundary into Mexico. The canal would follow the west bank of the river until it comes within a mile of the Mexican boundary; then it turns west through a deep cut, keeping north of the boundary and entirely in the United States, until it reaches the Imperial Valley. This requires a cut 60 feet deep, but it is the only means by which water can reach this valley without passing through Mexican territory.

THE POWER PLANT

The third feature of the development is a power house to be built just below the dam. When the reservoir is filled, water at the outlet gates will be under a pressure head of over 500 feet, and it will make possible the generation here of a million horsepower of electrical energy. A power house capable of this development is to be built.

The dam will cost $40,000,000, the All-American Canal $30,000,000, the power plant $35,000,000, or in all $105,000,000. It is proposed to finance this construction by a Government-bond issue, on which interest will have to be paid while construction is going on and until the revenue from power becomes available. This interest has been estimated at $20,000,000, making the total proposed bond issue $125,000,000.

No one questions that this great enterprise will be a financial success. Power revenues alone will pay interest on the development and create a sinking fund to to redeem the bonds in less than 50 years. Water sold for irrigation from the All-American Canal will return the entire cost of that structure and pay all its operating expenses, and, in addition, there will be revenue from water sold to cities and carried in great pipe lines, for which bonds have already been voted by the coast cities of California.

Comparisons serve to show the impressive magnitude of the engineering works needed to harness this river. The dam will be twice as high as any ever before built. The power house will generate twice the electrie energy of any now in this country. The canal will cost more than any of the great works of India or Italy.

SOCIAL AND ECONOMIC NEEDS

About $2,000,000 has been spent studying the river and gathering information necessary to the selection of the site for this development and preparing plans. This would not have been done if the need for these mammoth structures were not urgent. It becomes interesting and important, therefore, to follow the regulated flow of the river from the dam down to the place of use, and to understand the needs which support this large expenditure in harnessing this stream and the social and economic conditions under which these great structures will perform their service.

Doing this discloses a situation so unique and remarkable as to seem unreal. Nearly all rivers flow through the troughs of valleys, but the Colorado, where it crosses the international boundary into Mexico, flows along the top of the rim of a great bowl or a basin which extends up into California for a distance of more than a hundred miles. This bowl was once an arm of the Pacific Ocean, into which the Colorado River

Imperial Valley shipping shed, where the famous cantaloupes are graded and loaded for shipment

emptied on its eastern side. It is one of the greatest carriers of silt and sand in the world. In time the continued discharge of its burden built a barrier entirely across this arm of the sea, lifted it above the level of the ocean, and evaporation in time created north of it a great basin with its deepest part 300 feet below sea level and with a silt deposit in places 700 feet thick.

THE RIVER MENACE

This river is kept out of this basin now by means of levees along its north bank, which turn it south into the Pacific Ocean, but water is carried from it by a canal which runs through Mexico into the Imperial Valley, where 400,000 acres are now irrigated and 700,000 acres can be irrigated. Sixty thousand people live on the irrigated lands of this valley, watered from the Colorado, with all of their homes below sea level and from 100 to 200 feet below the level of the river where it crosses the international boundary. Two cities, El Centro and Calexico, will vie with any cities of their size in the United States in their wealth and the architectural attractions of their buildings. Every year the extension of land in the valley intensively cultivated increases. Fifteen thousand carloads of lettuce are being shipped out of that valley this year, mainly to eastern cities. Last year 15,000 cars of cantaloupes, the largest and best in the country, supplied the homes of the outside world. Date palms, citrus orchards, table grapes of wide variety, long-staple cotton are among the contributions to the tables and economic wealth of this country, made possible by the rich soil and varying climate of this valley.

The valley has once been threatened by destruction through inundation. For a year the whole volume of the Colorado poured into this basin, flooding farms, washing away houses, and doing millions of dollars of damage. Now, with the growing use of water along tributary streams and the extension of its use in Mexico, further extension of irrigation is stopped and the farms of the valley are menaced by irreparable loss through drought. In September, 1924, less than a third of the water needed by irrigators came down the river. There had been dangerous floods a few months before, followed by this devastating drought, that in two weeks caused a loss of $6,000,000 to the farmers.

AN ECONOMIC NECESSITY

A great dam and reservoir will end this. It will enable the water to be turned out of the great lake it creates just as it is needed. It will enable Los Angeles to have its 1,500 cubic feet a second, without interfering with the rights of irrigators above or below. The power generation will enable farm homes to be lighted at less cost, more wheels of industry to be turned, more mines to be operated, and the industrial development now going on can be continued and thus supplement the increasing wealth of agriculture. More than half a million acres will be added to the irrigated area below this dam. The All-American Canal will give greater security to the irrigators and end the menace of international controversy with Mexico. The plight of the people now living in the Imperial Valley the great increase in wealth and population which will result, make this in the truest sense a national enterprise, entitled to the interest and support of all the people, no matter where they live.

THE Western Slope Creamery Association, which consists of eight creameries, including towns on the Uncompahgre project, is shipping a carload of butter every five days to the California markets. These cars run from 24,000 to 30,000 pounds. It is estimated that more than 70 per cent of the butter produced on the Western Slope is now going to California markets, and more money is being paid to the producer for butterfat, owing to the pooling of shares and the buying of supplies cooperatively by the creameries.

Special Joint Committee Proposed on Construction Program

Membership would consist of the chairmen of the Senate and House Committees on Irrigation and Reclamation, the chairmen of the Senate and House Committees on Appropriations, the Director of the Budget, and the Secretary of the Interior

IN ORDER that expenditures from the reclamation fund may be kept within safe limits of its annual income, Secretary Work has proposed the appointment of a special joint committee to work out a future construction program for new Federal irrigation projects covering the next 10 years.

The suggestion was made in a letter sent to Senator Charles L. McNary, chairman of the Senate Committee on Irrigation and Reclamation. Membership of the committee, it was proposed, would consist of the chairmen of the Senate and House Committees on Irrigation and Reclamation, the chairmen of the Committees on Appropriations of the Senate and House, the Director of the Bureau of the Budget, and the Secretary of the Interior.

Citing that old projects will require $60,000,000 to complete and new projects now pending before Congress will require $60,000,000, more or less, to build and that 15 additional projects have been urged on the Interior Department this winter costing about $40,000,000, the Secretary stated that this program of expenditure was considerably in excess of the probable income of the reclamation fund.

"The average annual receipts of the reclamation fund applied to construction," he continued, "for the past five years have been approximately $8,500,000. There is no prospect of the annual income being increased during the coming five years. Excluding moneys advanced by private interests to aid in the construction of the American Falls Reservoir in Idaho, the total for last year fell $2,500,000 below the previous year."

The Secretary pointed out that with this threatened diminution in the annual revenues every increase in the number of projects will mean reduction in the amount allotted to each individual project and that there is also the danger, unless a definite authoritative building program is soon adopted, that the funds will be distributed over so many localities that work will be prolonged, costs increased, and dissatisfaction engendered regarding delayed development in the localities to be benefited.

The proposed 10-year building program, if adopted, could be modified in detail from year to year, the Secretary concluded, and at the same time it would relieve the Bureau of Reclamation and the Bureau of the Budget from continued pressure for new projects, make their development more economical and efficient, and finally furnish valuable information to the public.

THE SECRETARY'S LETTER

The letter in full follows:

"There has been spent in Federal reclamation more than $200,000,000.

"There will be required some $60,000,000 under present plans to complete old projects, $25,000,000 of which is being spent now.

"New projects pending in Congress will require $60,000,000, more or less, to build; while 15 additional projects have been urged on the department this winter that contemplate an expenditure of about $40,000,000.

"The average annual receipts of the reclamation fund applied to construction for the past five years have been approximately $8,500,000. There is no prospect of the annual income being increased during the coming five years. Excluding moneys advanced by private interests to aid in the construction of the American Falls Reservoir in Idaho, the total for last year fell $2,500,000 below the previous year.

"To complete projects already begun and those being considered by Congress would require, therefore, more than the anticipated revenues for the next 10 years. There is now available in the reclamation fund to meet the demand of existing appropriations $6,500,000. Of this about $2,000,000 must be reserved for the construction of the American Falls Reservoir.

"In the annual report of the Bureau of Reclamation for 1924 there was incorporated, on pages 26 and 27, a tentative 10-year construction program, beginning in 1925. This program was intended to inform Congress and the public of the demands on reclamation funds for the completion of projects then unfinished, for projects for which appropriations had been made, or for proposed projects being considered by Congress.

"It is evident that this program involves an expenditure considerably in excess of the probable income. Unless some of these projects are to be displaced, the construction program will have to be largely extended and the rate of progress on particular projects made much slower than is desirable.

NEW PROJECTS URGED

"During the present Congress little or no consideration has been given to this financial situation. The bureau is being continually urged to recommend projects not included in the tentative program. The result is the total of these recommended new projects, which have been introduced in Congress, and for which estimates have been made, aggregates about $33,000,000. If others for which there are no estimates are included, the total will be somewhere between $35,000,000 and $40,000,000. A number of these projects have great merit and should be included in a construction program if there were sufficient funds. With a threatened diminution in the annual revenues, every increase in the number of projects means reducing the amount allotted to an individual one. And there is also danger, if a definite and authoritative program is not soon adopted, that the funds will be distributed over so many localities that the work will be greatly prolonged, its cost increased, and dissatisfaction engendered regarding slowness of development in the localities which are to be benefited.

SELECTION BASED ON FEASIBILITY

"There is a widespread belief that the selection of new projects is largely governed by personal considerations. It needs to be made clear that this is not true. In addition, there is much to be gained by a coordinated and carefully thought out program of development, the preparation of which would be participated in by Congress, this department, and the Bureau of the Budget. Such a program, when adopted, should be adhered to until changed by congressional authority.

"If such action impresses you as judicious, it is suggested that you communicate with the Senate and House and request that a special joint committee be appointed, consisting of the chairman of the Senate and House Committees on Irrigation and Reclamation, the chairman of the Committees on Appropriations of the Senate and House, the Director of the Bureau of the Budget, and the Secretary of the Interior, to work out a scheme of future construction for the purpose of keeping within safe limits the amount of expenditures for the next 10 years.

"Such a program, if adopted, could be modified in details from year to year, but it would furnish valuable information for the public, relieve this bureau from continued pressure, and make development more economical and efficient.

"Attached hereto is a copy of the Annual Report of the Bureau of Reclamation for 1924, above referred to, and a list of additional projects or divisions of projects for which appropriations have been solicited."

The following is the list of projects for which appropriations are asked, not included in the tentative program of future work in the Twenty-third Annual Report of the Bureau of Reclamation:

Project	Estimated cost
Trinity River, Tex.	(1)
Red Bluff, Tex. (S. 2321)	$3,000,000
Alamogordo, N. Mex. (Carlsbad)	2,000,000
Rio Grande (Albuquerque)	(1)
Butte and Deer Creek, Calif.:	
Deer Creek	3,151,180
Butte	5,368,880
Orland (Stony Gorge)	1,485,000
Westland irrigation district, Oreg.	600,000
Stanfield irrigation district, Oreg.	300,000
Stanfield extension	300,000
Methew-Okanogan	4,400,000
Washington district	1,000,000
Gooding irrigation district	6,000,000
Casper-Alcova, Wyo.	13,500,000
Saragoga, Wyo.	2,560,000
Lonesome Prairie irrigation project, Mont.	

SENATOR McNARY'S REPLY

In a letter to Secretary Work, Senator Charles L. McNary, chairman of the Senate Committee on Irrigation and Reclamation, declined to accept the proposal of the Secretary on the ground that he did not deem the course of action wise because it would divide responsibility and would result in decentralizing authority in the selection of new projects when centralization of authority is needed to meet the excessive demands on the reclamation fund. The Senator's letter in full follows:

"Before me I have your recent letter stating that the demands upon the reclamation fund for the construction of new projects far exceed sums that will be available for a considerable period of time and suggesting that I 'communicate with the Senate and House and request that a special joint committee be appointed, consisting of the chairmen of the Senate and House Committees on Irrigation and Reclamation, the chairmen of the Committees on Appropriations of the Senate and House, the Director of the Bureau of the Budget, and the Secretary of the Interior, to work out a scheme of future construction for the purpose of keeping within safe limits the amount of expenditures for the next 10 years.'

"You ask me to take this action in the event it appears to be judicious. I regret, Mr. Secretary, to advise you that I do not believe this course of action wise. It would simply divide responsibility now wholly residing in you into as many human units as six is divisible by one, thereby passing the ultimate responsibility around in a circle without a beginning or an end. I feel that such a plan would work for decentralization when centralization of authority is greatly needed to meet the excessive demands on the reclamation fund, particularly when the only reservoir of information of the worthiness of the proposed projects is found in your department, the Bureau of Reclamation, and your chosen soil experts, engineers, and economists.

"The laws provide that you may examine into the merits of projects pressing for development and if convinced of their feasibility, transmit your approval with estimates of costs to the Director of the Bureau of the Budget, who, if satisfied the costs do not conflict with the economy program, will submit the estimates to the President. Meeting with the President's approval, the estimates are transmitted to Congress for appropriate action.

"The procedure here briefly sketched affords sufficient safeguards against wasting any portion of the reclamation fund on infeasible projects.

"The present plan and practice of committing to the Secretary of the Interior the responsibility of initiating the consideration of new projects and their construction, in my judgment, should not be substituted by your proposal, however hopeful you may be as to its excellence and desirability.

"In disapproving of your proposal, I must not be understood as being desirous of retreating from any responsibility placed upon me as chairman of the Senate Committee on Irrigation and Reclamation, as in such a capacity at all times you may be assured of my anxiety to cooperate with you in carrying out successfully this great work of development through reclamation."

[1] No estimate.

Judging a Project's Feasibility

By R. E. Shepherd, manager, Twin Falls North Side Land & Water Co.

THERE are certain questions that must be satisfactorily answered before any project should be undertaken.

The order in which I shall present these questions does not signify their relative importance, as I believe if any project will not at the time stand up under all of them it should be let alone until such time as it will. It will be observed that some of these questions go to the very vitals of an irrigation project, while others relate to the time of the undertaking. Changed conditions may make desirable in the future that which would now be unprofitable. Satisfactory answers should be required and proof offered as to each of the following questions. If doubt exists as to any one, time should be taken to clear it up.

1. Is the land to be reclaimed sufficiently fertile and its soil structure such as to produce valuable crops for an indefinite period without resort to excessive cost for fertilization?

2. Is the surface of the land such as to permit of its irrigation without too great expense, having due regard to the class of major crops that it is adapted for?

3. Can the land be readily drained at reasonable cost, so as to prevent its becoming swampy or alkalied, after repeated irrigation?

4. Is there an adequate supply of water available within a reasonable distance and in the project with the amount required to produce profitable crops?

5. Can this water be diverted for this purpose through a canal system that can not only be built within reasonable cost limits, but can thereafter be operated and maintained without excessive expense?

6. Is the project so located with reference to transportation and markets as to offer an incentive for its farm development?

7. Is there a present market demand for the products for which such land is naturally adapted, that under ordinary conditions would make the use of such land profitable to a farmer of ordinary ability and means?

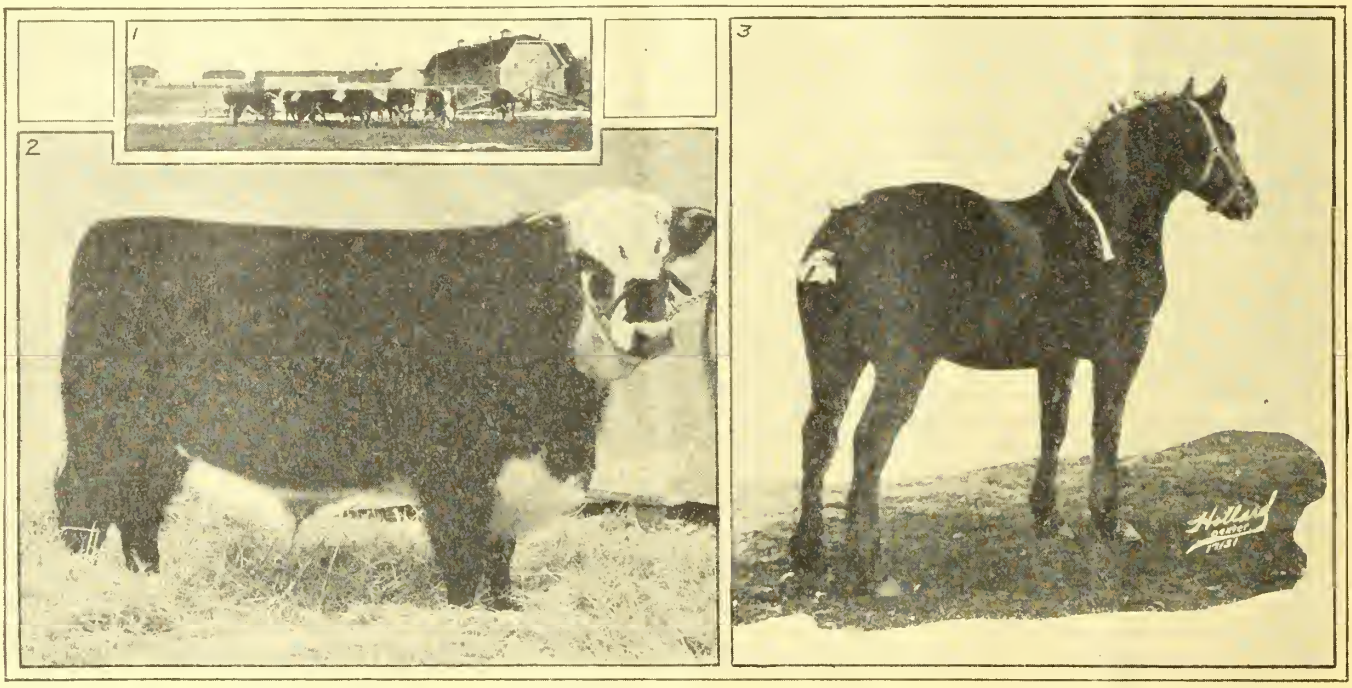
8. Will the entire cost of the work, including time required to secure settlement on the land, plus a reasonable profit, when spread over the entire area be such that the acre cost to the farmer, including the original cost of the land and its improvement by him, compare favorably with the cost of a farm in the humid sections, having due regard to character of crops, yield, and cost of production?

9. Is the project so financed as to the farmer that it will attract the man of limited means to locate thereon with assurance that he can succeed and meet his obligations promptly?

Livestock Improvement at University of Wyoming

The degree of improvement will depend upon the use of well-bred purebred sires; a rigid policy of culling females; and practicing approved and common-sense methods of feeding and care

By Prof. Fred S. Hultz, head of Animal Husbandry Department



1. The University of Wyoming Hereford herd. 2. Champion Shorthorn steer at the 1926 National Western Stock Show. He was bred, fed, and exhibited by the Univerity of Wyoming. 3. Grand champion Percheron mare at the 1926 National Western Stock Show. Owned and exhibited by the University of Wyoming

MUCH has been written about the importance of maintaining well-bred livestock on farms. Whether the farms are situated on a western reclamation project or are located in the heart of the Corn Belt, well-bred livestock will continue to play a most important rôle in their success. I purposely use the term "well bred" instead of "purebred." Purebred means just one thing—that a careful record of an animal's ancestry has been kept and recorded. Fortunately most purebreds are well bred, and most of our progress with domesticated animals has been with purebred stock. However, the fact of pure-bredness is not alone sufficient, because a high type of individual excellence should accompany every pedigree. The animal in question must be a good individual as well as have good ancestors.

It is not my purpose to belittle the purebred. Agricultural literature is full of proof that we must cling to the purebred for our livestock salvation. A known record of ancestry, commonly called a pedigree, should, and usually does, mean that careful thought has been given to the matings which appear in that pedigree. Each breed represents the ideal of a group of breeders, and the families in that breed represent the ideals of a smaller group of breeders. If the ideals of a certain breeder are known to be high, then that breeder's name on the pedigree means a great deal.

We know that offspring tend to resemble their parents; that is heredity. We also know of another force called variation, which causes offspring to resemble some of the ancestors further back in their family tree. It is variation which necessitates careful selection of all breeding stock, whether purebred or not. By selecting only good ones for breeding purposes we stand a better chance of getting good offspring.

The ability to recognize worth by examining an animal is called livestock judging. This ability is acquired tediously through long and varied experience, or more quickly by taking courses at the State agricultural colleges. It forms the very basis for success with livestock, as without the knowledge of what constitutes a good animal no one can intelligently buy, sell, feed, or breed animals.

THE THREE ESSENTIALS

A good pedigree, careful selection of the individual, and the right kind of care are the three essentials to livestock improvement. The best purebred will look like a scrub if not properly fed, and then no one can tell by his appearance if he is a good one or not. Heredity forms the skeleton, but the feed pail puts in the outlines. We can not spare the feed pail and hope to attain success in the development of the animal.

Dr. Mead has suggested that the readers of the RECLAMATION ERA might be interested in knowing what is being done toward livestock improvement at the University of Wyoming. Herds of Hereford, Shorthorn, Holstein, and Guernsey cattle, Percheron horses, Duroc-Jersey, Tamworth and Poland-China hogs, and flocks of Rambouillet, Hampshire, Corriedale, Lincoln, Oxford, and Southdown sheep are maintained at our farm, as well as several breeds of poultry. These animals are kept primarily for classroom instruction, but also one of the functions of an agricultural college is to assist stockmen in securing better livestock.

The quickest and cheapest way of accomplishing this is to produee good animals on our own State farm. We use only purebred, registered stock for breeding purposes, practice a rigid policy of selecting only the best for retention in the herds, and feed young stock adequately so as to be insured of their maximum growth and development. Many of these fine young animals have been sold out over the State to breeders, farmers, and ranchmen and have thus assisted in livestock improvement.

SPECIAL PROBLEMS OF THE STATE

Wyoming's system of animal production differs from that of most other States. Due to our climate, geographical location, wide variation in altitude, and distance from the great market centers, we are confronted with problems not common to other sections.

Many changes in production methods in recent years have presented an imperative need for experimental investigation. A few of the livestock projects now under way at the University of Wyoming are fattening beef calves, feeds for wintering range ewes, Wyoming feeds for produeing pigs, dairy-cattle feeding, incubating chicks at high altitudes, and rations for egg production in Wyoming.

Any policy of improvement must look toward the future. There has never been a time when high-class meat animals received a higher premium for being high-class than now. It takes an exceptionally good steer to market as fat beef at 12 to 18 months of age, and a fine lamb to make a choice 40-pound carcass. Almost any fair steer can be made fat and marketable in two or three years, but the housewife is demanding handy-weight euts of meat and these come only from young beef and lamb. The reduced export demand is also a factor in making the market requirement what it is. We no longer have much demand from Europe for heavy beef carcasses. Occasionally a load of well-fatted 3-year-old steers will sell well on the market to go toward supplying the fancy hotel or restaurant trade, but this demand is comparatively limited. To seeure a top price on the market, steers must class as baby beef. This class, as was pointed out above, can be produced only from well-bred, typey, early maturing calves of a highly improved sort.

FACTORS FOR SUCCESS

Regardless of whether your object is the production of feeder stock, finished meat, dairy products, or poultry, your success will depend upon the degree of improvement accomplished with your herds and flocks. I will say that the degree of your improvement depends upon:

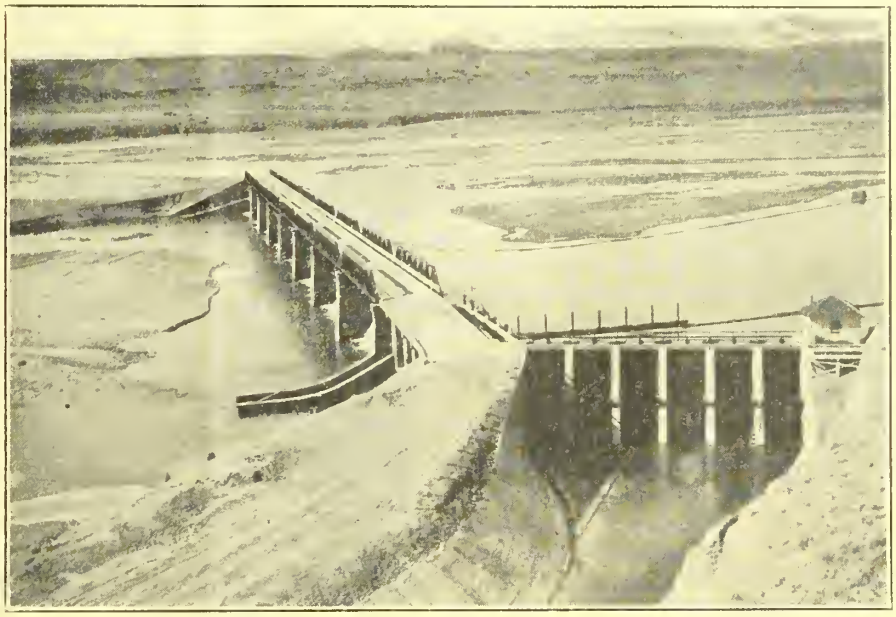
1. The use of well-bred purebred sires, carefully selected as individuals.

2. A rigid policy of eulling females for retention in the breeding herd.

3. Practieing approved and common-sense methods of feeding and eare, particularly as regards adequate development of young stock.

Your State agricultural colleges are anxious to assist you in every way possible. Their doors are always open to boys and girls who wish to study the livestoek industry and thereby become more proficient in livestock improvement

Land Opening on Riverton Project, Wyo.



The Wind River diversion dam on the Riverton project, Wyo.

EARLY in this month 20 irrigable farm units on the Riverton projeet, Wyoming, will be opened to entry under the new regulations providing for the selection of settlers on the basis of approved qualifications of industry, experience, character, and capital.

The irrigable area of the farms ranges from 35 to 108 acres, averaging about 75 acres. Water for their irrigation will be available during the eoming season.

Until July 1, 1926, the farms will be open to entry only by ex-service men who served in the United States Army or Navy in the World War and have been honorably discharged or placed in the Regular Army or Naval Reserves, provided that they are qualified to make entry under the homestead laws. After that date any remaining farms may be filed on by any qualified person.

Applieants will be passed on by an examining board and will be seleeted in accordance with the regulations of the department. Each applieant must have had at least two years' experienee in farming and must have $2,000 in money free of liability, or the equivalent in livestoek, farming equipment, or other assets.

Irrigation water will be furnished the successful applicants during the seasons of 1926, 1927, and 1928 for a minimum advance payment eharge of $1 per acre for 2 acre-feet, with additional water at the rate of 50 cents per acre-foot. As these lands were originally part of the Wind River, or Shoshone Indian Reservation, the entryman must pay, in addition to the reclamation charges, $1.50 per acre, of which 50 cents must be paid on the date of entry, and 25 cents per acre per year for each of four years thereafter. The construction charges on the land will be announeed later.

Full information concerning the opening, together with the farm application blank which must be filed by eaeh applicant, may be obtained from the superintendent of the Riverton project, Riverton, Wyo., from the Commissioner of Reelamation, Washington, D. C., or from the chief engineer, Bureau of Reclamation, Wilda Building, Denver, Colo.

Women on the Projects and Their Relation to Better Agriculture

The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life

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

THE old days are gone forever. Now when a man decides to take up a farm unit on a Federal irrigation project, he doesn't do all the questioning of the local officials of the Government. He is presented with a form of application which is designed to bring out the facts showing whether he possesses sufficient capital, experience, and is surrounded with other favorable conditions which have been found to be desirable.

Recognition of the importance of the woman's part in this great undertaking of establishing a home upon the land is mutely acknowledged in this question in the bureau's form of application:

"If married man, what experience has your wife had in farm life?"

Experience has proven that this factor is not to be underestimated, and that a farmer's ambition to become successful may be helped materially by marrying a girl brought up on the farm. Town-bred women are less likely to be contented.

In discussing the form of application and the above-quoted question in particular, the commissioner unwittingly formed the basis of this article when he said:

"That question is far more important than many others on our questionnaire. I knew four successful farmers on one project to quit their farms merely because they had married town girls."

The farmer's wife is responsible primarily for the well-being of the family, and as her main sphere, the management of the house. To this sometimes is added care of the poultry yard and garden. The woman's share in planning the farm work may sensibly increase the gross yield, and the net profit may also be larger in consequence of her excellent administration of her trust; and thus the economic basis of the family may be strengthened.

Economy versus Efficiency

Nine women out of ten believe themselves thrifty and economical when they "wear out" their old, run-down, misshapen shoes "round the house" where few notice what they have on, and many tasks inevitably dim the shine and spoil the appearance of any shoes. The tenth housekeeper perhaps realizes that when she wears comfortable, well-fitted shoes with broad, low heels and roomy toes, at her work, she can get through the

Miss Mae A. Schnurr, associate editor in charge of the women's section

day without a backache or tired feet, that she can stand straighter and for a longer time if necessary, and, in fact, be generally more efficient.

In California the home demonstration agents have been conducting active campaigns in 12 counties during the past year to convince farm women of these facts, and to show them how to select their own and their children's shoes properly. Most of these rural mothers and housekeepers are keenly interested in scoring the shoes they happen to be wearing at the meeting where the subject is introduced, and in comparing their footwear with the types of good-health shoes exhibited by the extension worker who addresses them.

A report received by the United States Department of Agriculture states that as a result of these campaigns dealers are willingly cooperating with the home demonstration agents, lending models of approved shoes, instructing people in taking correct foot tracings and measurements, and providing more careful service in fitting shoes at the local stores.

Talks on foot hygiene are supplemented by such illustrated material as slides, X-ray pictures, photographs of good and bad choice of shoes, and the ills resulting from wearing the wrong kinds. Foot exercises for strengthening muscles and arches are demonstrated. It is also shown that stockings must be properly fitted and that garters should not restrict circulation.

Better Kitchens—A Woman's Delight

One of the first things the home maker thinks about in a better home is a well-arranged, well-equipped kitchen. That does not mean that she is kitchen-minded either. It means rather that she knows where convenience counts most in a house. In most family kitchens at least 1,000 meals are cooked during the course of every year. Surely for any job that comes as regularly and often as getting three meals a day, every step-saving, time-saving arrangement possible should be included in the plan and the equipment.

The points that make for convenience in the kitchen are as follows, according to the Bureau of Home Economics:

First, last, and all the time in planning and equipping a kitchen, says the bureau, think about the work to be done in it.

If building or remodeling a kitchen, make it oblong and with no more floor space than actually needed. A kitchen is a workroom. Spaciousness is paid for in miles of useless steps.

Study the relation of the kitchen to the rest of the house. Make a direct connection from kitchen to dining room in the common wall between them. See to it also that there is easy access to front and back doors, to the telephone, and to the stairs to the cellar and the second floor.

Arrange for adequate ventilation in all weathers and for good lighting at all work centers at night as well as during the day.

Screen windows and doors against household pests. Flies particularly are a menace to health.

Choose finishes for floor, walls, and woodwork that are durable, suitable in color, and can be kept clean easily.

Select furnishings that fit the wall and floor space and they will pay for themselves in usefulness. Weigh the pros and cons of built-in or movable pieces and compare prices carefully.

Make sure that there is an abundant supply of hot and cold running water and a sanitary drainage system.

Decide on the most comfortable height of working surfaces.

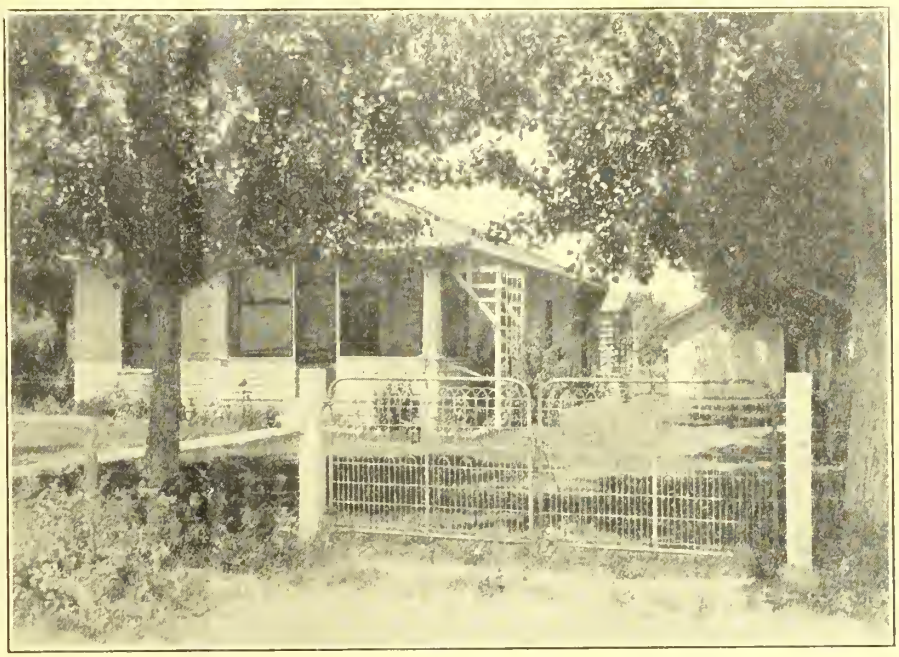
Group all equipment, large and small, into compact work centers for preparation of raw food, cooking, serving, clearing away and dishwashing, and any other activities done regularly and often in the kitchen.

The kitchen is above all else a place to prepare and serve food. Limit the kitchen to this use, if possible, and arrange for laundering and such work to be done in another place.

A breakfast alcove built in one end of the kitchen not only adds to the kitchen's appearance but saves the housewife many steps and keeps the work in one room for at least one meal.

Felt for Chair Legs

Felt glued on the ends of chair legs will prevent them from marring the polished floor. Also this simple device will do away with the scraping noise chairs generally make when moved about. There are rubber caps manufactured for this purpose, but the felt will be found easier to attach, as it can be cut to any size. Long strips also can be cut to fit the rockers of rocking chairs.



A home on the Minidoka project, Idaho

Rural Homes on the Minidoka Project

By Mrs. R. S. Moy, of Rupert, Idaho

THERE are about 2,500 farm homes within the boundaries of our Minidoka project, Idaho. Approximately 50 per cent of these homes are equipped with electricity and convenient water systems.

The greater proportion of these homes are substantial in structure, many of different new types of brick, some of cement, and many of first-quality weather lumber. Because all homes are comparatively new it is quite an attractive spectacle to visitors to see so many substantial, well-painted buildings erected in the short span of scarcely 20 years.

However, there are real vital factors in this environment that cause home making and settling to be very desirable, because of the natural advantages here for a home and for the family.

With the availability and small cost of electricity, the work of the housewife is lessened materially. Upon survey we find a large percentage of our home makers using electric milk separators, electric flatirons, electric washers, electric hot plates, electric curling irons, electric percolators, electric warming pads, electric water heaters, toasters, ranges, and waffle irons.

With the great development of poultry and dairy production which we have here, the housewife's work is made much easier with these mechanical aids because naturally poultry, milk, cream, and butter disposal can be handled by men of the household more readily if they have electric equipment to work with. This eliminates a great amount of work from the housewife's budget, allowing her more time for cultural privileges and the beautifying of her home to which, as a rule, the farmer's wife can give so little attention.

But this type of material development is not the only advantage. We find hand in hand with it the finest progress in those factors which build for future citizenship. The auxiliary agencies of schools, churches, and libraries are highly developed because of the very fine leadership available on a new project through helpful agencies. This has meant rapid, substantial, and well-founded development which easily parallels that on any older project in this or any other State.

Project Women Urged to Share Their Domestic Science Secrets

We will print in the ERA *all recipes, with credit to authors; also any good household hints.*

We will also be glad to print from time to time in the women's section accounts of personal experiences of our project women in their work of helping to make homes in the arid region.

Let us hear from you.

Try This

SUE'S FUDGE CAKE

½ cup butter or margarine.	2 squares chocolate melted over hot water.
1 cup sugar.	1 teaspoon salt.
2 cups pastry flour.	¾ teaspoon soda.
1 cup buttermilk.	1 teaspoon baking powder.
1 well-beaten egg.	1 teaspoon vanilla.

Cream butter and sugar, add egg and chocolate. Add flour, baking powder, soda, and salt, sifted together—alternately with milk. Flavor with vanilla. Pour in greased pan and bake at 350° F. Frost.

Appreciation

Mrs. Moy has furnished the first article for the women's section, and I hope others will follow in sufficient numbers to publish one or more in each issue.

An account of the ideas, plans, and personal experiences of the women and children on the projects is bound to make interesting reading for others. In return for the contributions you make of material for this section I pledge to you hours of research every month into the things I believe will interest my readers. My compensation will be appreciation and the knowledge that what I present in this section is read by many.—*M. A. S.*

Uncompahgre Project Lamb and Cattle Feeding Tours

An interesting account of how farmers on the project are utilizing the by-products of the sugar-beet crop and of sugar manufacturing.—These tours should result in more finishing of stock and improved feeding methods

By H. A. Ireland, County Extension Agent, Montrose County, Colo.

FOLLOWING the introduction of sugar-beet growing on the Uncompahgre project, Colorado, came an interest in the feeding of lambs and cattle on the by-products of the crop and of sugar manufacture. With the rapid increase of this interest there was a need for more definite information, applicable to local conditions, regarding feeding methods, equipment, expected gains, costs of gains, etc. That men feeding or planning to feed cattle or lambs might be brought together for the discussion of these and other questions, and to review the results of experimental feeding of beet by-products, two tours were planned and have been held, one for lamb feeders in December and one for cattle feeders in February. Both were widely advertised through meetings, local papers, and circular letters addressed to all sugar-beet growers of Montrose and Delta Counties, and both were fairly well attended. The interest manifested by those on the tour and attending the meetings held in connection with the tours was very good.

WHAT THE LAMBS WERE FED

The lamb feeders' tour was held on December 15 and 16. Starting from Delta at 10 o'clock a. m. on the 15th visits were made to the feed yards of the following men: Alfred Smith, where 600 lambs from Utah were being fed on beet tops, pastured in the fields, and alfalfa. These averaged 70½ pounds at loading point and were received October 1.

W. P. Dale had elected to run a small band of 600 head of aged ewes, breeding them as early as he could after buying the ewes and getting them down from the range, with the idea of making an early market lamb and of feeding both ewes and lambs together. The ewes were on stubble fields with some alfalfa pasture and beet tops and were looking good. The demand for old ewes has been greater than the supply.

Mr. McConnell was feeding a small bunch of lambs in dry lots, on hay, beet tops hauled in, and squash, and apparently making a satisfactory gain in weight.

FEEDING BEET PULP

After a trip through the feed yards of the Holly Sugar Co. where several hundred cattle were being fattened on beet pulp and hay, and following a lunch provided by some of the larger-hearted lamb feeders of Delta, in the community rooms, the tour continued to the farm of Scott Bros., one of the larger operators, where another band was seen pasturing in the beet fields with hay fed in panels in the field. Across the road B. C. Marchbanks had 1,200 head on beet-tops pasture and was feeding hay in corrals at night with some beet pulp. M. H. Patnode, an old cattle feeder, had put in 2,100 lambs which had been fed tops and hay in large corrals till the tops were gone, when pulp had been substituted with a small amount of molasses and later a little barley. Ford Sayre was feeding 600, hauling beet tops from the field, and feeding hay in panels.

A meeting was held in connection with the Lions Club luncheon in Delta in the evening at which E. J. Maynard, in charge of feeding investigations of the Colorado Agricultural Experiment Station, Ralph Mahon, general livestock agent of the Denver & Rio Grande Western Railroad, and L. M. Pexton, traffic manager for the Denver Union Stock Yards, were present and discussed various problems with feeders and shippers.

The second day's tour was similar to that of the first, starting from Montrose and including stops at the farms of the Holly Sugar Corporation, where 120 head of steers were being fed in corrals as a test on hay and beet tops: N. E. Marchbanks, where 847 lambs were feeding on beet tops, hay, and ear corn: F. W. Vernon, who was feeding 1,500 lambs on alfalfa and stock beets grown for that purpose; C. W. McLaughlin, who had 2,000 head on tops in the field, and hay; and M. H. Patnode, who was visited the first day. A meeting was held in Olathe, at the high school at noon.

Some of the stock inspected was owned by the feeders, some was being fed on contract. No definite information could be gained at the time, but the purpose of the tour was to give feeders and prospective feeders an opportunity to note the rations used on different farms, compare the stock, and then in the meetings hear rations and feeding methods discussed by a man with wide experience in experimental feeding.

About 150 persons attended the two meetings held, most of these also going on the tour. Mr. Maynard states that the affair compared favorably in all respects with the annual tour held in the lamb-feeding section of northern Colorado.

VARIETIES OF CATTLE FEED

On February 10 a cattle feeders' tour similar in plan and purpose to the tours of January 15 and 16, was held on the project. Cattle feeding is less popular than lamb feeding at this particular time and it was necessary to include feeders of both counties in one tour to fill the day. The following is a statement of farms visited and stock and methods inspected:

Harry Hoover was feeding 111 head of yearling Herefords on corn, silage, and alfalfa; Elmer Smith had 50 head of short 2-year-old Hereford steers on silage, alfalfa hay, and cottonseed cake, to which he planned to add some beet molasses after seeing results of experiments with rations similar to the one he was using; John Boyden was feeding some calves and cows on silage, alfalfa, and molasses; Alfred Smith had 100 head of baby beeves on alfalfa, beet pulp, molasses, cottonseed cake, and a small amount of oats, which with the grain eliminated is considered the ideal ration for beet-growing sections from the standpoints of both efficiency and economy; E. J. Hatcher had 110 head of yearlings on alfalfa, pulp, and corn; Hallock Bros. had a somewhat mixed bunch of steers and heifers on alfalfa, pulp, and corn silage; and W. W. Newton was feeding a choice bunch of 28 2-year-olds on alfalfa and corn silage. B. W. Fairbanks, State livestock specialist, commented on the rations used at each stop, and at a meeting held in Delta in the evening led a general discussion of rations and feeding methods. A total of about 70 persons attended the tour, the greatest number present at any one farm being 55. Everyone present seemed to feel well repaid for the time spent.

More finishing of stock for market and a general improvement in rations and feeding methods are the results hoped for from the tours.

Revision of the Government's reclamation policy is expected to give a new impetus never before known to the reclaiming of arid and semiarid land.

The proposed Colorado River development will be one of the greatest engineering undertakings ever attempted by the Government.

Law Notes of Interest to the Irrigationist

Submitted by the district counsel and others

CONDEMNATION IN TEXAS

THE Government brought suit to condemn land for the Tornillo Canal in the Texas division of the Rio Grande Federal irrigation project. The defendant landowners asked that the suit be dismissed on the ground that the law extending Federal irrigation to Texas is unconstitutional, there never having been any public lands in that state. Delays in the suit caused the Bureau of Reclamation to change the course of the canal and utilize other lands. Those described in the suit being no longer needed, the United States moved to dismiss the case. The defendants contested this motion, alleging that the construction of the Tornillo Canal had damaged them to the extent of $20,000, and asking for judgment in that amount. The Government's motion being allowed, the defendants appealed to the circuit court of appeals. In Owen et al. *v.* United States (8 Fed. (2d) 992) the appellate court sustained the decision of the lower court, holding that the Government may dismiss a condemnation proceeding at any time before there is a taking of property which vests right to compensation, that the Government can not be sued without its consent, and that defendants cross-claim, being in excess of $10,000 was not within the jurisdiction of the district court.—*O. H.*

WARREN ACT WATER RIGHTS TAXABLE

The Northside Canal Co. (Ltd.), an Idaho corporation, has a contract with the United States, authorized by the Warren Act of February 21, 1911 (36 Stat. 925), which provides for a water supply for that company, from the Jackson Lake Reservoir of the Minidoka Federal irrigation project. The reservoir is in the State of Wyoming and the lands irrigated by the water are in Idaho. The taxing officials of Wyoming sought to tax the "equity or water rights in Jackson Lake Reservoir" held by the company, and suit was brought by the company in Federal court to enjoin the assessment and collection of such taxes. The United States intervened, asking the same relief. In Northside Canal Co. (Ltd.) *v.* State Board of Equalization et al. (8 Fed. (2d) 739) it was held that the rights of the plaintiff in the reservoir are taxable in Wyoming; that this is not the taxation of Federal property; that such taxes are not invalid on the ground that they tend to make Government contracts under the Warren Act less desirable; and that the fact that the legal title to the reservoir is in the United States is immaterial. An apeal has been taken and is now pending.—*O. H.*

FEDERAL VERSUS STATE WATER LAW

S. Clare Mower, a farmer on the Boise Federal irrigation project in Idaho, brought suit to enjoin J. B. Bond, the project superintendent, from cutting off his water supply because of delinquency for more than a calendar year in the payment of an operation and maintenance charge. The procedure proposed by the project superintendent was in accordance with Federal law but alleged to be contrary to State law, which the plaintiff contended should apply. This contention by the plaintiff was denied by the court in Mower *v.* Bond (8 Fed. (2d) 518).—*O. H.*

The Water Supply On the Projects

Water supply conditions on the projects at the end of February were as follows: Prospects for additional storage and natural flow were above average on the Belle Fourche, North Platte, and Orland projects; average on the Carlsbad, Strawberry Valley, and Umatilla projects; average for Minidoka, as to additional storage, and for Grand Valley and Uncompahgre as to natural flow. On the Boise, Klamath, Milk River, Minidoka (Jackson Lake), Newlands, Okanogan, Rio Grande, Sun River, and Yakima projects the prospects were below average, and on the Salt River project the prospects were very poor. The Huntley, King Hill, Lower Yellowstone, and Yuma projects, which are without storage, are assured of full water supply from natural sources. The Riverton and Shoshone projects, which have storage, are assured of full water supply for present development. Since January, conditions have improved on the Newlands, Okanogan, Orland, Strawberry Valley, and Umatilla projects, while the prospects are less favorable on the Milk River and Sun River projects.

FIRST DEFICIENCY ACT, 1926

(Extracts from.) An Act Making appropriations to supply urgent deficiencies in certain appropriations for the fiscal year ending June 30, 1926, and prior fiscal years, to provide urgent supplemental appropriations for the fiscal years ending June 30, 1926, and June 30, 1927, and for other purposes. (Approved March 3, 1926, 44 Stat. —.)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, to supply urgent deficiencies in certain appropriations for the fiscal year ending June 30, 1926, and prior fiscal years, to provide urgent supplemental appropriations for the fiscal years ending June 30, 1926, and June 30, 1927, and for other purposes, namely: * * *

Bureau of Reclamation

North Platte project, Nebraska-Wyoming: For continuation of construction and incidental operations, including the general objects of expenditure enumerated in the second paragraph under the caption "Bureau of Reclamation," contained in the Interior Department appropriation act for the fiscal year 1926, $300,000, to remain available until June 30, 1927, and to be paid out of the "reclamation fund."

Yakima project (Kittitas division), Washington: For continuation of construction and incidental operations, including the general objects of expenditure enumerated in the second paragraph under the caption "Bureau of Reclamation," contained in the Interior Department appropriation act for the fiscal year 1926, $2,000,000, to remain available until June 30, 1927, and to be paid out of the "reclamation fund." * * *

Judgments of United States courts

For payment of judgment rendered against the United States by the United States District Court for the District of Wyoming, on September 2, 1925, in favor of the Bothwell Co., in condemnation proceedings under section 7 of the act of June 17, 1902 (32 Stat. 388), for the acquisition of lands for the Pathfinder Reservoir, $9,600, together with interest thereon at 8 per cent per annum from July 3, 1909, to and including February 19, 1923, and at 7 per cent per annum from February 20, 1923, until the date of payment, payable from the "reclamation fund" created by said act.

None of the judgments contained herein shall be paid until the right of appeal shall have expired. * * *

Washington Irrigation Institute Adopts Irrigation Resolutions

AT its annual meeting, held on February 11 and 12, the Washington Irrigation Institute adopted, among others, the following resolutions relating to irrigation:

Resolved, That reclamation by irrigation is an important factor in American agriculture with an increasing influence in the economic production of an adequate national food supply. Although some mistakes have been made in both national and private projects, these are now serving as a preventative of their repetition on future projects.

Resolved, That with the new era in the organization, selection, and administration of reclamation projects which include soil, adequate water supply, and a market for the products of the soil, the settler will have a reasonable opportunity for success; and the State being benefited greatly by the increase in property values, Washington Irrigation Institute favors a policy of cooperation between the Federal Government and the State or irrigation district or a local land-settlement corporation in procuring settlers for reclamation projects created by Federal appropriations.

Resolved, That we believe that the State of Washington is fundamentally interested in irrigation and reclamation and should adopt a reasonable State policy. The legislature has created a commission to investigate and report at its next session upon the whole question of State reclamation and upon a policy for future procedure. It is, therefore, recommended by Washington Irrigation Institute, that the president appoint a committee of three members to conduct an independent study and cooperate with such legislative commission, if deemed advisable, and report its findings to this institute prior to the next session of the State legislature.

Alkali Soil and Its Reclamation

By C. C. Wright, specialist in irrigation investigations, State College of Washington

CERTAIN areas on practically all irrigation projects have been damaged by the accumulation of alkali in the surface layers of the soil. The extent of these areas and damage, varies from a few acres where partial crop production is possible to large tracts thousands of acres in extent, where scarcely any crop plants can be grown. This accumulation of alkali in one place or another, usually in the lower lands of irrigated projects, seems almost inevitable under our present irrigation methods and practices. In the future it may look just as foolish to build an irrigation system without its accompanying drainage system as it would look now to put in a city water system without a sewer.

Hundreds of thousands of dollars are being spent in the Western States every year in the reclamation and attempted reclamation of alkali lands, while thousands of acres more are "going bad" each year. Hence the prevention of alkali land bears the same relationship to its reclamation as the prevention of diabetes or influenza bears to its treatment and cure. And there are just as many disappointments in trying to reclaim alkali land as there are in trying to cure diabetes or the flu.

Excessive accumulation of alkali salts in the soil is invariably associated or has been associated with inadequate drainage and a resulting high groundwater table of relatively salty water. The soil blanket above the water acts like a wick in that it absorbs the water with dissolved salt at its lower side and loses water by evaporation from its surface, the salts being deposited at the place of evaporation.

Most crop plants will not tolerate a concentration of salt in the soil solution much above 1.5 per cent. This means that in order to be safe for crop production the salt content of the soil should be rather less than 0.5 per cent. When the soil contains this amount of alkali the first consideration in its reclamation must be to in some way get rid of the excess salt. Little or nothing can be accomplished by trying to grow crops which are especially tolerant of alkali, such as sweet clover or some of the salt grasses which are used for pasture, until the excess salt has been removed. There is only one method known for the reclamation of alkali soil. That method is to reverse the process by which the salt has been deposited. The salt was brought into the soil by the upward movement of water to replace evaporation loss. If the soil is to be reclaimed that salt must be moved downward through the subsoil by heavy irrigation and carried away by drains.

The removal of this excess salt, however, is not always accomplished by simple drainage. Certain types of alkali soils will not become normal or productive by merely removing the soluble or "washable" salts which so often has been assumed in reclamation practice, but the replaceable sodium, which is held in combination with the soil or absorbed by it, must also be displaced. Experiments are now in progress on certain alkali lands in different parts of the country to determine the best methods of accomplishing this result. Present indications are that applications of gypsum or sulphur, either alone or with manure, will be a necessary part of the procedure.

But by properly sampling the soil of an alkali area and subjecting these samples to chemical analysis it is now possible to tell whether the area can be fully reclaimed by drainage alone or whether it will need special chemical treatment in addition. In case such special treatment is necessary it is not easy to tell what the cost will be or what will be the rate of reclamation. These, along with many others, are questions to be answered by future experiment.

Boards Appointed To Select Settlers

Additional boards of examiners to select settlers have been appointed on the following projects:

Sun River project, Montana.—G. O. Sanford, superintendent, Fairfield, R. L. Clarkson, Choteau; Henry Radcliffe, Fairfield.

North Platte project, Nebraska-Wyoming.—H. W. Bashore, superintendent; Mitchell, Nebr.; Henry M. Springer, Mitchell; Royce F. Tebbet, Torrington, Wyo.

Rio Grande project, New Mexico-Texas.—L. M. Lawson, superintendent, El Paso; F. J. Rigney, jr., Las Cruces, N. Mex.; H. L. Kent, State College, N. Mex.

Riverton, Wyo.—H. D. Comstock, superintendent, Riverton; J. J. Jewett, Riverton; P. B. Dykeman, Riverton.

In future relief will be granted only to individual farmers who furnish satisfactory proof of inability to meet charges.

Operation by the Water Users

From "The Gazette," Reno, Nev., February 11, 1926

THE sooner the settlers upon Federal irrigation projects take over their operation and maintenance, which is being seriously considered by those upon the Newlands project, the sooner they will bring their affairs to a proper business basis and remove themselves from the depressing influences which have attended prolonged Federal operation.

Not only Secretary Work and Commissioner Mead, but the Fact-Finding Commission which conducted extensive investigations two years ago, went far beyond immediate consideration of the Government's financial interests when they urged that such steps be taken. In reality they were primarily influenced by the welfare of the settlers themselves when they advised them to stand upon their own feet and become the actual and active owners and operators of the works which the Government had built for their benefit.

As excellent authorities upon reclamation have pointed out, it was never intended by Congress, when it enacted the reclamation law, that the Federal Government should remain the operator of any project for an extended length of time after bringing its lands to a productive basis. The entire theory of the act was that the Government would finance the construction of the works and then surrender them to the settlers who would repay the cost and operate them as their own property under restrictions which would insure proper maintenance. It was never meant that Government operators should remain forever upon the ground and that the settlers should be placed in the same category as Indians upon reservations.

It would be incorrect and ungrateful, however, to belittle the fostering efforts which have been put forward by the Government upon behalf of the settlers. In fact, it has been more than generous. True, it has made mistakes, costly ones, but on the other hand it stands ready to cancel the charges in all such instances. It has frequently postponed the collection of operation charges when no such postponements would have been allowed by a privately owned irrigation district or a banking corporation. And its leniency, it truthfully may be said, has not infrequently been abused by demands, which have been conceded, for wholesale moratoriums and large cancellations.

In every instance the best interests of both the Government and of the settlers will best be served by the latter taking over completely project operation and maintenance. Before this can be done, of course, there must be a clear definition of the repayment charges to be undertaken by the settlers, a clear limitation upon project areas, and an understanding that the Government will complete storage and other works not yet finished. To such a plan the Government is agreed.

The owners of the project farms will then be placed upon their own responsibility. They will manage their own works, make their own collections, and be practically independent of distant control from which the Government wishes to escape. It will be up to them to direct not only their farms but their irrigation systems, which they are fully competent to do if they will only attempt it.

Uncompahgre Man Breaks Corn Record

AN announcement was made at the Olathe Corn and Potato Show that Morgan Sweitzer, one of the Uncompahgre project farmers, had broken all State records in producing 114 bushels of corn to the acre during the 1925 season. The corn was grown on 3.4 acres of ground on Garnet Mesa and the total yield amounted to 390 bushels of shelled corn which averaged 114 bushels to the acre. The corn was grown on ground that had been in orchard during previous years.

The measurements were made by the Montrose and Delta county agents and are official. Ten pounds of selected seed were sown to the acre. The seed bed was in perfect condition and a perfect stand was obtained.

It was hoed at once, cultivated, and irrigated as necessary. The corn was well matured and uniform in type and of a variety known as U. S. No. 133.

The corn was planted on May 7 and was not irrigated until May 16. The methods used as announced by Mr. Sweitzer consisted of less irrigation and more irritation. The log of Mr. Sweitzer's activities was as follows:

April 16, 17, double disked.
April 18, 22, plowed, followed by harrow twice.
April 24, cross disked.
April 25, cross harrowed.
April 27, cross floated.
April 28, rolled.
April 28, 30, floated three times, diagonal each way and up and down.
May 3, rolled.
May 7, planted, 2-row planter, 10 pounds of seed per acre.
May 8, marked out.
May 16, irrigated.
May 27, harrowed diagonally.
June 1, irrigated.
June 8, cultivated with 5-tooth harrow cultivator.
June 12, cultivated.
June 17, cultivated.
June 22, marked out.
June 25, irrigated.
July 1, cultivated.
July 7, cultivated.
July 8, hoed weeds.
July 10, marked out and laid by.
July 18, irrigated.
August 2, irrigated.
August 21, irrigated.
September 15, corn fully matured.
September 22, slight frost.
October 15, killing frost.
November 19, December 11, harvested and stored in bin.

In referring to the success obtained by Mr. Sweitzer, Professor Olin, of the Denver and Rio Grande Western Railroad, stated that the secret of success lay in the cultivation of the soil and that big crops in all lines consisted of working the ground, working the ground again, and then working the ground some more.

Yakima Valley Crops Bring Good Returns

Crop movement in the Yakima Valley has been more satisfactory recently, and all crops probably will be marketed at remunerative prices before the new crop is available.

Shipments of apples have amounted to 10,773 cars, with 4,000 cars in storage.

About 700 cars of potatoes were shipped during February at prices running from $45 to $55 a ton for No. 1. Growers who held their crops in storage are having to sort, owing to some rotten ends, and will probably not get as much for their crop as if they had sold out of the field.

Hay is moving to market in a satisfactory manner.

The construction work now being conducted by the Bureau of Reclamation is stimulating to an inestimable degree business and industrial activities throughout the West.

The proposed Columbia Basin project in Washington will cost approximately $193,360,000. The amount of land available for irrigation is estimated at between 1,000,000 and 1,500,000 acres.

Agricultural Demonstration Program

THE agricultural demonstration work on the Minidoka projeet, Idaho, is handled through two agencies—the United States Department of Agriculture and the county agent. John T. Montgomery, associate agrieulturist of the Department of Agrieulture, devotes most of his time to animal husbandry, and J. W. Barber, county agent, to crop work, poultry management, marketing, etc. In addition, Miss Esther V. Kahle, under university extension auspices, gives valuable aid and advice in dietetics, prenatal eare, clothing problems, and other phases of home economies. All these agencies work in harmony with the Minidoka project office. The following is the program of demonstration work on the project for 1926:

Crop work will embrace the following schedule: Crop elubs (boys and girls); grain standardization and certification, with variety tests, disease control, and weed control; clover-seed production and marketing; corn improvement; potato improvement, involving seed production and selection and disease control; demonstrations on beans and peas; urging of permanent cropping plans, involving balanced rotations combined with appropriate livestocking systems providing outlets for bulky erops; general horticulture and home gardens; record keeping; marketing organizations.

An outline of the livestock program is as follows:

CATTLE

BEEF

Selling surplus.

DAIRY

1. Elimination of inferior and scrub bulls by replacement with purebred, with known produetion.
2. Exchange of bulls to retain proven sires.
3. Purehase of few better bulls to head pure bred herds.
4. Cost accounts on dairy herds.
5. Cow-testing associations; organize more.
6. Dairy buildings:
    1. Sheds for eows,
    2. Milk houses (caring for milk and eream).
7. Feeding the dairy cow:
    1. Rations.
    2. Minerals.
8. Breeding problems.
9. Disease control:
    1. Sterility in heifers.
    2. Abortion.
    3. Tuberculosis test.
10. Expansion dairy outlets; cream pool; creamery.
11. Calf club.

SHEEP

1. Flock improvement by—
    1. Use of better rams.
    2. Culling inferior ewes.
    3. Retaining choice ewe lambs.
    4. Breeding ewes at proper age.
    5. Breeding early to secure growth on lambs.
2. Study of flock production from standpoint of—
    1. Wool production.
    2. Mutton production.
3. Sale of pure bred ram lambs to range sheep men; sale of market lambs through cooperative shipments.
4. Disease and parasite control.
5. Sheep clubs.

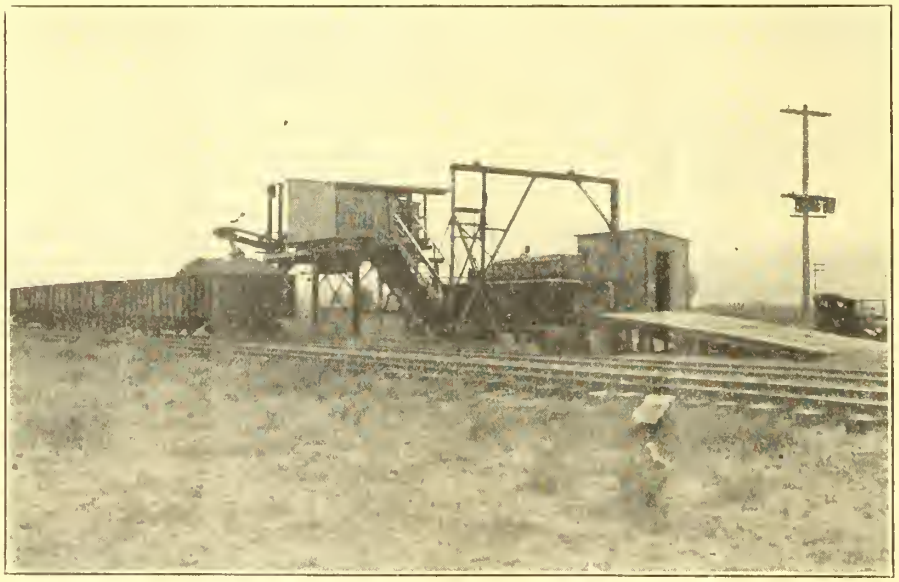
SWINE

1. Encourage keeping a few hogs on every farm.
2. Cooperate with few farmers in cost accounting.
3. Cooperate feeding tests.
4. Ton-litter contest.
5. Clubs.
6. Cooperative marketing.

POULTRY

1. Improved housing.
2. Increase flock size on farms where poultry is a major industry.
3. Poultry accounting.
4. Improved breeding.
5. Marketing; cooperative egg marketing; cooperative turkey pool.
6. Capon raising.

Some attention will also be given to sueh matters as rodent control and the campaign against sparrows; predatory animal control; insect control; extermination of noxious weeds; home economics.



Electric sugar-beet dump on the Minidoka project, Idaho

Growing Head Lettuce After Raising Onions

Growing head lettuce in the Uncompahgre Valley after the Bermuda onion crop is harvested is advoeated by K. Nakamura, aeeording to a recent press dispatch.

Mr. Nakamura states that a Japanese farmer on California Mesa last year sowed some head lettuce about August 10 and it made fine heads, ready for market in October. It was an experiment and the lettuce was not eared for as it might have been. He states that one of the big marketing organizations would like to get 15 or 20 carloads of this lettuce in the fall, and believes that the farmers in the valley should grow more of it, as it could be harvested after the crop at high altitudes is marketed. It is his impression that the crop could be seeded after the Bermuda onion crop is harvested, thus raising two crops on the same ground in one year.

Citrus Fruit on the Projects

NEARLY three hundred thousand 75-pound boxes of grapefruit, oranges, and lemons were grown on three irrigation projects in Arizona and California in 1925.

A recent compilation shows that 1,823½ acres of land on the Salt River project Arizona; the Yuma project, Arizona-California; and the Orland project, California, in that year produced 22,299,475 pounds of citrus fruit valued at 985,603, or $540.50 an acre.

More than 92 per cent of the total yield was produced on the Salt River project, Arizona, where more than 20,000,000 pounds of grapefruit, oranges, and lemons were grown, valued at $929,250, or $630 per acre.

The statistics are shown in the accompanying table:

Citrus fruit Grown on Reclamation Projects, 1925

Project	Acreage	Yields		Value	
		Total	Average per acre	Total	Per acre
		Pounds			
Salt River	1,475	20,650,000	14,000	$929,250	$630.00
Yuma	1½	1,350	900	68	45.00
Yuma Auxiliary (Mesa)	73	967,875	13,258	29,075	398.29
Orland	274	680,250	2,483	27,210	99.30
Totals and averages	1,823½	22,299,475	12,229	985,603	540.50

TIETON WATER USERS REPLY TO QUESTIONS

The Tieton Water Users' Association, Yakima project, has sent out a questionnaire to each of the 1,225 water users on the division, asking, in substance, the following questions:

(*a*) Do you want more water for your land?

(*b*) Are you in favor of the 35-year plan of payments?

(*c*) In case the 35-year payment plan is made a law, do you favor taking over the operation and maintenance of the project?

Six hundred and one replies were received, 594 of which answered "yes" to the first question and 7 "no." All were in favor of the second, and 421 voted "yes" on the third question and 168 "no," a few not voting on these two questions.

NEWLANDS FARMERS WANT ELECTRICITY

Water users on the Newlands project, Nevada, have been active recently in planning for and constructing power distribution lines to supply farms with electricity. Approximately 15 miles of such lines have been built or are under construction. The expense is borne by the water users themselves under cooperative arrangements. The Nevada Valleys Power Co., which distributes power generated at the Lahontan power plant, which is under lease to the Canyon Power Co., has submitted a proposal to the water users for the construction of lines and distribution of power over the project. Farmers in the Sheckler, Harmon, and Stillwater districts have formed tentative organizations to promote power development in their respective localities.

Should the Colorado River development be authorized by Congress, the general prosperity and wealth of the Southwest would be enhanced almost beyond calculation.

Aided and Directed Settlement

SOLUTION of the perplexing problems that have confronted the development of Federal reclamation in the country for the past decade is believed to be in sight, according to a statement issued recently by Secretary Work.

The proposed measure, which the Senate Committee on Reclamation has approved, to be used as an experiment in financing and aiding settlers on two projects, the Secretary believes, will determine definitely whether this method of developing lands under Government irrigation is feasible and practical. His statement follows:

"Reclamation Bureau officials are gratified at the progress being made in Congress toward the enactment of legislation which promises a satisfactory solution of reclamation problems, both from the viewpoint of Congress and the Department of the Interior. The bill recently drafted asking an appropriation of $500,000 to cover a period of three years for experimentation on two reclamation projects to determine whether financial assistance to settlers would be both feasible and practical, has been approved by both the Senate Reclamation and Appropriation Committees. It is believed that Congress will before adjournment accept this measure, which embodies what the bureau feels are perhaps the first steps in a definite solution of one of the most perplexing problems which has confronted reclamation development in this country for the past decade.

"Legislation for State aid to reclamation settlers was first introduced in the Sixty-eighth Congress, and a law was enacted in 1924 obligating States to aid those selected settlers on new projects who possessed $2,000 or its equivalent in farm equipment. With the passage of this act the Reclamation Bureau was, of course, obliged to observe this law and proceed under it. The State of Washington cooperated with the Reclamation Bureau in the administration of the new act, but Oregon and Nevada failed to extend their cooperation when the Department of the Interior sought to administer the new law in those States, especially those provisions relating to State aid for the new settlers.

"The legal division of the Interior Department recently, after an extensive survey and study of State statutes relating to public lands, found that several of the States could not, under their constitution, extend aid to settlers as provided for in the national act. This situation was explained to the Senate Committee on Reclamation last week, and I immediately offered the same substitute for State aid which the department offered and supported last year in the Kendrick bill. This substitute proposal was accepted by the Senate committee, and a bill at once drafted, which was introduced in the Senate and favorably reported out of committees.

"Reclamation Bureau officials believe that aid in preparing land for new settlers will be necessary. Many foreign governments have extended similar aid to pioneer land settlers, which has resulted in some instances in profitably tilled land, and I am sanguine that the proposed new plan will at least furnish a basis in this country for constructive experimentation. It is felt, however, that the public mind perhaps is not at this time sufficiently advised in this direction to either approve or disapprove such a policy, from an immediate permanent viewpoint, and the Reclamation Bureau is not willing now to recommend heavy expenditures in such a line of development until experimentation has proved the wisdom of such a course."

Organization Activities and Project Visitors

DR. Elwood Mead, Commissioner of Reclamation, was in New York City during March as the representative of the Department of the Interior on Engineering Council for the consideration of the question of a Department of Public Works.

Thomas Dignan, an attorney in Glasgow, Mont., has been in Washington, D. C., recently representing the two divisions of the Milk River project in the matter of adjustments.

George E Stratton, superintendent of the Milk River project, spent some time at the Washington office in consultation with the commissioner on project matters.

O. H. P. Shelley, newspaper editor of Red Lodge, Mont., visited the Washington office during March to discuss questions relating to adjustments on the Milk River project.

Col. B. F. Fly, guardian of the Yuma Mesa, has been appointed special Washington representative of the Truckee-Carson irrigation district, Newlands project

Gov. D. W. Davis has submitted his resignation as director of finance.

Randolph E. Fishburn, American consulting engineer, and Armando Santacruz, Mexican consulting engineer, members of the International Boundary Commission, were in Yuma during February, in connection with a survey of the Colorado River to determine definitely the status of about 1,800 acres of accretion land at present undeveloped and for which water is available.

Superintendent Weber of the Orland project has been in Berkeley recently for a conference with the district counsel and the counsel for the Orland Unit Water Users' Association regarding certain stipulations connected with the adjudication suit.

Assistant Engineer E. T. Eriksen of the Orland project spent considerable time at Colusa, Willows, and Red Bluff in an examination of the county records for use in the adjudication suit.

Assistant Engineer E. R. Romberg, of the Grand Valley project, was in Denver for several days' vacation.

W. H. Olin, agriculturist of the Denver & Rio Grande Western Railroad; Waldo Kidder, agriculturist, Colorado Extension Service; and B. W. Fairbanks, livestock extension agent of the Colorado Extension Service, visited the Uncompahgre project recently.

District Counsel B. E. Stoutemyer was on the Minidoka project for a couple of days to attend public meetings held by the water users of the Burley irrigation district for the purpose of explaining the terms of the proposed agreement under the act of December 5, 1924.

Yakima Apples Shipped Abroad

Two cars of fancy Winesaps left the Yakima project recently bound for England and Germany. The German market requires the larger sizes and the shipment to that country carried sizes ranging from 125 to 175 apples per box. The English market takes a smaller apple, and the fruit going there ran from 175 to 216 per box.

The apples are being shipped across country and will be loaded for export in New York.

Superintendent Youngblutt, of the Belle Fourche project, was in Washington recently in conference on repayments and terms under which water would be delivered to settlers in 1926.

Engineer Walker R. Young has been placed in charge of the Kittitas project with headquarters at Ellensburg, Wash.

John A. Lee, power-house foreman on the Riverton project, has resigned to accept a position with the Sunnyside Mining & Milling Co., of Eureka, Colo.

Associate Engineer J. R. Iakisch, of the Shoshone project, made an inspection trip recently to the Lower Yellowstone project in connection with the preparation of a report on proposed drainage construction on the latter project.

Prof. Ivan C. Crawford, dean of the School of Engineering of the University of Idaho, was a recent visitor at the American Falls Dam.

Recent visitors on the Milk River project included Frank Scotten and J. C. Dow, of the Montana Power Co.; District Counsel Roddis; W. Y. Cannon, Montana manager for the Utah-Idaho Sugar Co.; Robert Howard, superintendent of the Chinook Sugar Factory; and E. R Schepplemann, chief clerk of the Lower Yellowstone project.

Assistant Engineer E. W. Fritsch, of the Newlands project, was called to Evansville, Ind., recently on account of the serious illness of his father, who died two hours after his arrival.

A conference was held in Reno during February for the consideration of the application of the Lake Tahoe Co. to lease the Government 63-acre tract at the outlet of Lake Tahoe. Those present at the conference included Superintendent Richardson, of the Newlands project, representing the Government; C. T. Bliss and Henry F. Droste, representing the Lake Tahoe Co.; E. J. Foulds, representing the Southern Pacific Co.; and Roy Stoddard, C. E. Kent, B. S. Holmes, and A. D. Drumm, representing the Truckee-Carson irrigation district.

Victor L. Minter, former chief clerk on the Carlsbad project, has resigned to accept the position of secretary of the Carlsbad Chamber of Commerce. He has been succeeded as chief clerk by Walter C. Berger, former bookkeeper on the Yuma project. Jean C. Thrailkill, formerly on the Riverton project, will succeed Mr. Berger as bookkeeper at Yuma.

A. C. Cooley, of the Department of Agriculture, attended the recent economic conference at Hermiston, Umatilla project. It is believed that much benefit will accrue to farming operations on the project as a result of the conference, which was attended largely by project water users.

C. R. Wheeler, assistant clerk, has been transferred from the Williston project, North Dakota, to the Klamath project, Oregon-California.

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 — P. W. Dent, Assistant to the Commissioner — C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. N. McCulloch, Chief Clerk

George C. Kreutzer, Director of Reclamation Economics

Denver, Colorodo, Wilda Building

R. F. Walter, Chief Engineer; S. O. Harper, General Superintendent of Construction; J. L. Savage, Designing Engineer; L. N. McClellan, Electrical Engineer; Armand Offutt, District Counsel; Harry Caden, Fiscal Agent; Andrew Weiss, Assistant Director of Reclamation Economics; B. E. Hayden, Industrial Agent.

Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak	F. C. Younghlutt	R. C. Walher	R. C. Walher	Wm. J. Burke	Mitchell, Nebr.
Boise	Boise, Idaho	J. B. Bond	E R. Mills	C. F. Weinkauf	B. E Stoutemyer	Boise, Idaho.
Carlshad	Carlshad, N. Mex	L. E. Foster	W. C. Berger		Ottamar Hamele	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	A. R. McGinness	J. P. Siebeneicher	M. M. Wilson	E. E. Roddis	Billings, Mont.
King Hill [1]	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	G. E. Stratton	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Boise, Idaho.
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	T. R. Pacl	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash	Calvin Casteel	W. D. Funk	N. D. Thorp	H. L. Holgate	Portland, Oreg.
Orland	Orland, Calif	R. C. E. Weber	C. H. Lillingston	C H. Lillingston	R. J. Coffey	Berkeley, Calif.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	V. E Hubbell	Wm. J. Burke	Mitchell, Nebr.
Salt River [2]	Phoenix, Ariz	C. C. Cragin [3]				
Shoshone	Powell, Wyo	L. H. Mitchell	W. F. Sha	Mrs. O. C. Knights	E. E. Roddis	Billings, Mont.
Strawberry Valley	Provo, Utah	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont
Umatilla	Hermiston, Oreg	H. M. Schilling	C. M. Voyen	C. M. Voyen	H. L. Holgate	Portland, Oreg.
Uncompahgre	Montrose, Colo	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Yakima	Yakima, Wash	J. L. Lytel	R. K. Cunninghau	J. C. Gawler	H. L. Holgate	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 [4]	H. N. Bickel	O L. Adamson	B E. Stoutemyer	Boise, Idaho.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [4]	Chas. Klingman	T. R. Pacl	Wm. J. Burke	Mitchell, Nebr.
Umatilla, McKay Dam.	McKay Dam, Oreg	R. M. Conner [5]	C B. Funk	W. S. Gillogly	H. L. Holgate	Portland, Oreg.
Kittitas	Ellensburg, Wash	Ralph Lowry [4] Walker R. Young	E. R. Mills		H. L. Holgate	Portland, Oreg.

[1] Project operated by King Hill Irrigation district.
[2] Project operated by Salt River Valley Water Users' Association.
[3] General Superintendent and Chief Engineer.
[4] Resident Engineer.
[5] Construction Engineer.

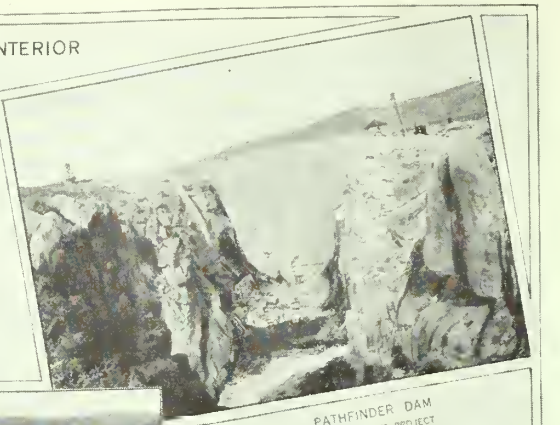
Important Investigations in Progress

Project	Office	In charge of—	Cooperative agency
Sacramento Valley	Berkeley, Calif	N. B. Hunt	Sacramento Valley Development Association and State of California.
Huerfano	Denver, Colo	E. B. Debler	
Dubois	American Falls, Idaho	F. A Banks	Dubois Project Finance Association.
Milk River eastern tributaries	Hermiston, Oreg	E. R. Crocker	
Spanish Springs storage	Fernley, Nev	A. W Walker	
Harney Valley	Boise, Idaho	J. B. Bond	
Owyhee	do	do	
Vale	do	do	
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	State of Utah.
Methow-Okanogan	Okanogan, Wash	Orrin C. Smith	Okanogan irrigation district.
North Platte (Casper) pumping	Guernsey, Wyo	F. F Smith	State of Wyoming.

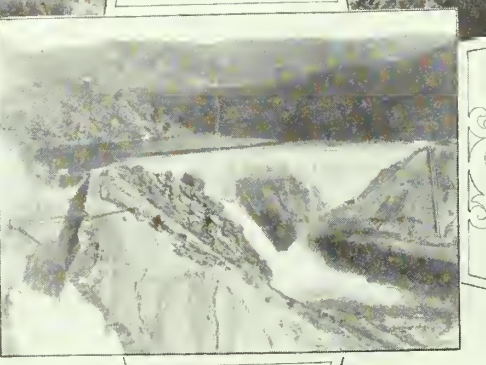
The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau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

DEPARTMENT OF THE INTERIOR

BUREAU
OF
RECLAMATION

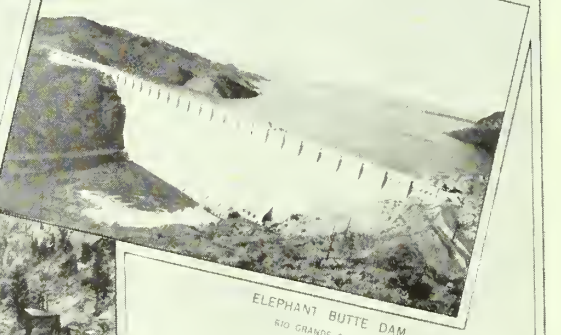


SUN RIVER DIVERSION DAM
SUN RIVER PROJECT
MONTANA

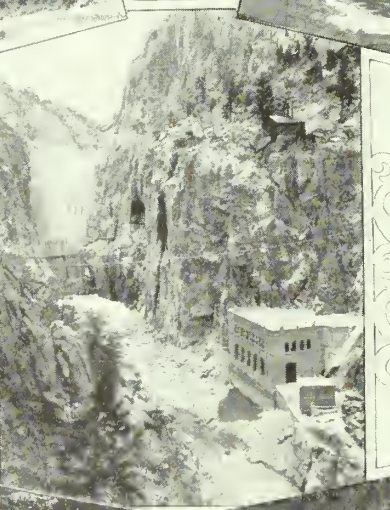


PATHFINDER DAM
NORTH PLATTE PROJECT
NEBRASKA-WYOMING

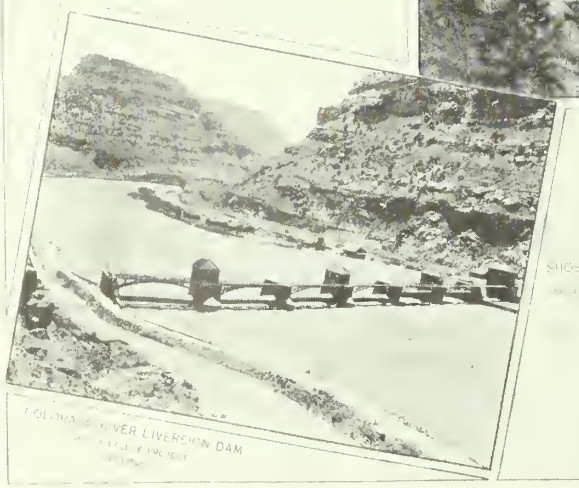
ARROWROCK DAM
BOISE PROJECT
IDAHO

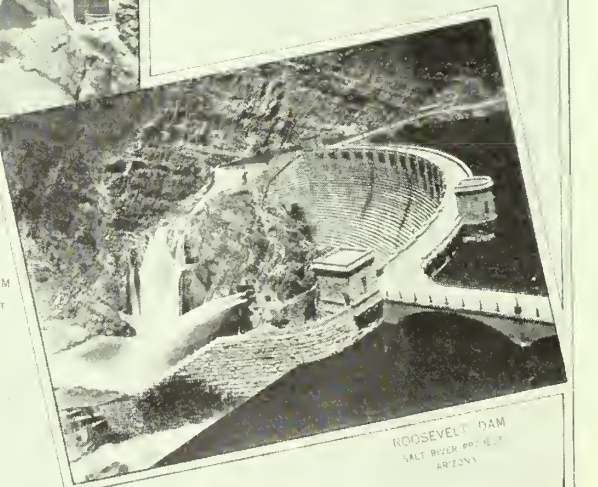


SUNNYSIDE DIVERSION DAM
YAKIMA PROJECT
WASHINGTON



ELEPHANT BUTTE DAM
RIO GRANDE PROJECT
NEW MEXICO-TEXAS





SHOSHONE DAM
[illegible] PROJECT
WYOMING

COLUMBIA RIVER DIVERSION DAM
[illegible] PROJECT
[illegible]

ROOSEVELT DAM
SALT RIVER PROJECT
ARIZONA

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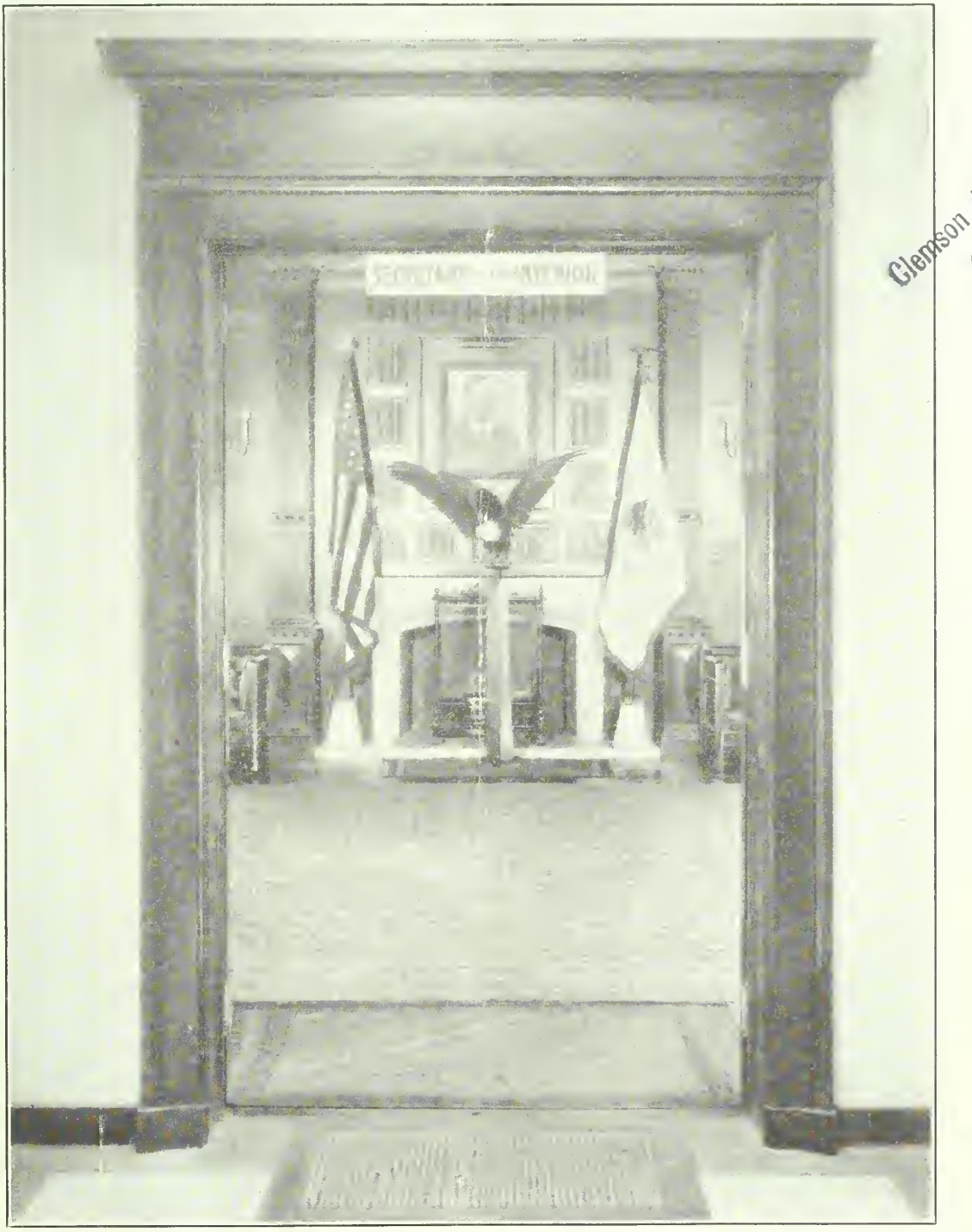
NEW RECLAMATION ERA

VOL. 17 MAY, 1926 NO. 5



"THE OPEN DOOR"
DEPARTMENT OF THE INTERIOR—OFFICE OF SECRETARY WORK

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Government Publications

Hand-picked Settlers

"SECRETARY of the Interior Work, in a recent public utterance, recognizes the basic ailment of Government reclamation. He said that the wrong kind of settlers had been permitted to take up land on new projects. A survey of one project showed an ex-deep sea diver, an ex-baseball player, and a half dozen other ex-this or ex-that—men who obviously were not fitted to take up new land and make it produce as might be expected.

"Hereafter the Government is going to hand-pick every settler for reclamation projects. In the early days of western colonization everyone was invited to come and take a homestead. The West wanted people, and it didn't make much difference then whether they could make a success at farming or not.

"Reckless settlement of irrigation projects is just as damaging as reckless colonization. The West still needs more people; but one good citizen—a dependable pioneer who can be expected to build up the taxable wealth of the commonwealth—is of more value than a dozen herded in just to increase the census count. In its strictest significance, 'hand-picking' settlers may sound cruel, but it will eliminate in the long run a great deal of the suffering and sorrow that come when the law of the survival of the fittest begins to operate."

—From an editorial in the Salt Lake Tribune.

NEW RECLAMATION ERA

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HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 17 MAY, 1926 No. 5

High Lights on the Reclamation Projects

OPERATION of the Boise project, Idaho, was turned over to the board of control of the Nampa-Meridian, Boise-Kuna, and Wilder irrigation districts on April 1. Superintendent Bond was retained by the board as manager of the project.

DURING March 289 carloads of agricultural products, valued at $261,700, were shipped from the Yuma project. Since the first of the year the value of such products has amounted to $1,094,200. Collections of charges during the month amounted to $59,840.01.

NINETY acres of citrus trees were planted recently on the Yuma Mesa, mostly in 10-acre tracts, and it is estimated that this year's plantings will amount to 165 acres, most of the development being done by nonresident unit holders. The outside public is becoming more and more interested in the possibilities of the Yuma Mesa, and the development in the next few years will probably be much greater.

SUPERINTENDENT Page of the Grand Valley project reports that there seems to be very little disposition on the part of any of the farmers to further delay payments of charges if it is at all possible to meet their obligations.

MANY thousand baby chicks have been received on the Newlands project and many more have been hatched on the project during the month. The coming year will mark the greatest poultry activity, including chickens and turkeys, that the project has experienced.

PRELIMINARY forms have been mailed to all owners of unoccupied land on the Belle Fourche project as the first step in the land-listing program under the supplemental contract.

THE canal and distribution system of the south side pumping division of the Minidoka project was taken over for care, operation, and maintenance by the Burley Irrigation District on April 1.

AN economic survey of Idaho agriculture is being carried on by representatives of the University of Idaho, the Idaho State Department of Agriculture, and the United States Department of Agriculture. A study will be made of the production and marketing of Idaho farm products, consumption and distribution of farm products in home and outside markets, competing producing areas, and a determination of the most profitable combinations of farm enterprises. The crop and livestock census reports for the Minidoka project for several years were loaned for this research.

ABOUT 350 carloads of potatoes were shipped from the Minidoka project during the month, bringing to growers approximately $1,000 per car. At the end of the month dealers were paying around $4 per hundred weight for No. 1 Russets.

IT is estimated that 250,000 sheep and 40,000 head of cattle were fed in the North Platte Valley this season, furnishing a market for project feed and adding greatly to the fertility of the soil. The implement companies in the valley report the sale of 325 manure spreaders since January 1.

THE Holly Sugar Corporation reports the signing of contracts for 7,000 acres of sugar beets tributary to the Grand Junction factory, of which probably one-third is on the Grand Valley project. The acreages of early potatoes and beans will continue to place these crops among the primary crops of the project.

DELINQUENT water users on the Uncompahgre project were notified on March 1 as to the amounts required of them prior to delivery of water during 1926. One thousand and twenty-eight delinquent accounts were mailed, and during the month 480 of these were cleared for water by the payment of charges. Total collections amounted to $59,504.71 during the month.

THE first car of Bermuda onion sets ever received on the Uncompahgre project arrived on April 1. This car contained 4,000,000 sets. It is estimated that the crop should mature about August 15 and that an excellent market will be available.

TWO rat men have been employed on the main canal, Sunnyside division, Yakima project, and as a result 800 gophers were trapped in addition to digging out and puddling numerous gopher holes in fills that were sufficiently close to the water to be dangerous.

ON the Tieton division of the Yakima project payments are being made much better than they were last year, the total collections for March amounting to $29,220. Out of 1,300 water users 150 were delinquent to the extent that they could not get water without making additional payments. This represented about 4,600 acres. The greater part of these will pay in a short time in order to get water, as they represent land the majority of which is able to pay. The present policy of insisting on the payment of charges is meeting with good results on the Yakima project.

EXCAVATION of the upper and lower tunnel approach channels at Guernsey Dam, North Platte project, was completed on March 19, and the river started through the diversion tunnel on that date.

93675—26†——1

Optimistic Outlook on West's Problems Taken by Secretary Work

Discusses legislation regulating grazing on public domain, adjustment of reclamation problems, development of Colorado River Basin, oil conservation on Osage Indian Reservation, mineral leasing on Indian reservations, and construction of Coolidge Dam.

AN optimistic outlook for a definite settlement of the major problems of the West during the present session of Congress was taken by Secretary Work of the Interior Department in a statement issued prior to his departure on a trip to the Southwest to inspect proposed dam sites for the lower Colorado River development and other official business connected with his department.

The Secretary asserted that through coopcration between the committees of Congress and the department, satisfactory legislation has been proposed for the regulation of grazing on the public domain, the final adjustment of Federal reclamation difficulties, the development of the lower Colorado River, the conserving of oil on the Osage Indian Reservation instead of compulsory leasing, and other important national policies of concern to the West.

ESTABLISHMENT OF GRAZING DISTRICTS

"Lack of a grazing policy on the national domain," said Secretary Work, "has been a disturbing factor in the livestock business of the West for a number of years. The gratuitous use of the public domain as an unrestricted range for livestock has led to over grazing and destruction of the native grasses. The Interior Department has recommended the rectification of these conditions at the last two sessions of Congress. It was not until the present Congress, however, that definite steps were taken toward legislation.

"The bill now before Congress provides for the establishment of grazing districts on areas of the public domain through the petition of a majority of the livestock raisers using them for grazing purposes. It also authorizes the execution of leases between the Government and these organized livestock growers for a period of 10 years in which they are to be given exclusive grazing privileges on them. The amount of fees are to be determined on a basis of the size of the area leased, the number and kind of livestock, and the value of grazing rights.

"The advantages of this proposed new policy are self-evident. Stockmen will have permanent areas on the public domain for the ranging of their cattle. It will be to their interest to preserve and conserve the pasturage. A special feature of the proposed law prohibits the homesteading of the leased grazing districts under the stock-raising and general enlarged homestead acts. This means that these arcas can not be constantly invaded by outsiders, as is the case under the prcsent system.

RECLAMATION ADJUSTMENTS

"With regard to Federal reclamation, a final appraisal of this Government enterprise is included in legislation now before Congress for final action. The terms of the omnibus adjustment bill provide for the charging off of construction costs for works built by the Government in the past to irrigate worthless, infertile, and unproductive lands on the various projects. They also provide for the negotiation of contracts between the United States and water users' associations and irrigation districts in which these organizations are to take over the operation of the projects and guarantee the repayment of construction costs due the Government.

"Heretofore the execution of these contracts has been difficult and, in many instances, impossible. Farmers on the projects through their constituted organizations have been unwilling to assume joint liability for the repayment of these construction costs charged against their projects covering worthless and unproductive farms. The assumption of these costs by the Government to be charged off as a fixed loss will straighten out this situation. It will place Federal reclamation, I believe, on a sound business basis and make it a going concern in the future.

THE COLORADO RIVER BASIN

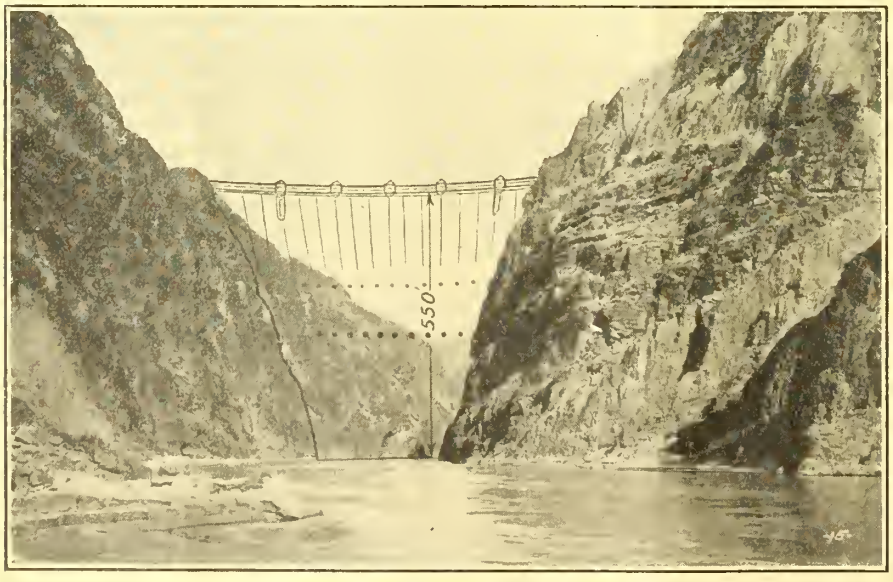
"Concerning the development of the lower Colorado River, this question has been under consideration for the last 80 ycars. Almost $1,000,000 have been expended by the Federal Government in investigations of flood control on the river, its irrigation, power and domestic water resources. For the first time since these inquiries were inaugurated prior to the outbreak of the Civil War, a concrete and comprehensive plan has been recommended to Congress by the Interior Department for developing the natural resources and possibilities of the lower Colorado.

OIL CONSERVATION

"An important step toward oil conservation has also been taken in legislation recommended to Congress with regard to leasing of Osage Indian lands. This rcservation contains the largest oil pool ever discovered in the world. Under the present law it is compulsory for the department to offer for lease large areas of these mineral lands annually regardless of market oversupply, prices, and disastrous competitive drilling. The new legislation, which has been urged for several years by the department, proposes to remedy this situation by providing for the optional leasing of this rich oil field in the future.

"Other legislation dealing with the West has been recommended by the department to Congress and is now in the course of enactment. Mineral leasing on the Executive order Indian reserva-

(Continued on page 75)



The Boulder Canyon damsite on the Colorado River

Selecting Settlers on Basis of Approved Qualifications

This is the first step, in the opinion of Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, in laying the foundation for the success of new projects. The second should be aided and directed settlement

THE opening to entry early in April, of 20 irrigable farm units on the Riverton project, Wyoming, marks the beginning of an entirely new method of selecting settlers on Federal reclamation projects under the new law.

On each irrigation project where public land is still available for entry examining boards have been appointed by the Secretary of the Interior, usually comprising three individuals, including the superintendent of the project and two public spirited citizens, who serve without pay. Before being allowed to enter a vacant public land farm unit on a Federal irrigation project each prospective settler must satisfy this examining board that he possesses the necessary qualification of industry, experience, character, and capital to warrant the belief that he will be successful in his venture.

THE FARM APPLICATION BLANK

As an aid in guiding the decision of the examining board, a form of farm application blank has been prepared by the Bureau of Reclamation which each prospective entryman is required to fill out and file with the board, in proof of his fitness and qualifications to undertake the development of a farm unit. The first three questions relate to the entryman's qualifications to make entry under the homstead laws; his citizenship; and whether he has a preference right as an ex-service man. Then follow questions covering his present occupation, age, farming experience under irrigation or in the humid regions, sex, marital condition, age and sex of children, number of dependents, health, ownership of other farm land, and whether this is mortgaged. The names of three citizens who have known the applicant for at least five years must be submitted as references. Then follows a detailed statement of assets in the form of cash, livestock, farm implements, and furniture. The estimated value of these assets, less the liabilities in the form of mortgages and other debts, gives the net worth of the applicant, which under the regulations, must be at least $2,000.

RATING THE APPLICANTS

In order to determine the relative standing of the applicants, each of the basic qualifications of industry, experience, character, and capital is considered as having a possible weight of 25 per cent, in accordance with the accompanying table:

No applicant will be considered eligible who falls below the minimum named in any one of the headings in this scale; or who does not, in the opinion of the examining board, possess the health and vigor necessary for active farm work.

NEW PLAN MEETS APPROVAL

The form of the farm application blank is the result of our experience in the selection of settlers and planned rural community development in Australia and in California State land settlement, but in order to check this new departure with the opinions of others who are thinking along these lines, the form was sent to each of the State agricultural colleges for comment. It is gratifying to note that in every instance these replies indicate that the bureau has taken a forward step in thus attempting to safeguard the interests of both the Government and the settler, as indicated by the following extracts:

"I think your questions are very practical and answers to these questions should lead you to be able to make an intelligent

(Continued on page 76)

Industry	Per cent	Farm experience	Per cent	Character	Per cent	Capital	Per cent
Fair	5	Two years or more in farming, other than by irrigation	15	Fair	5	$2,000	15
Good	15	Two years or more in irrigation	25	Good	15	3,000	20
Excellent	25	do	25	Excellent	25	5,000	25

An abandoned homestead—one of the results of not selecting settlers on the basis of approved qualifications

Optimistic Outlook By Secretary Work

(Continued from page 74)

tions is to be definitely settled by the legislative branch of the Government, in whom sole authority for deciding this issue is vested. With the enactment of a law authorizing the appointment of a consulting board of engineers, construction work on the Coolidge Dam in Arizona is soon to be started. This reclamation project will bring 100,000 acres of Indian and private lands under irrigation.

"Most of the activities of the Interior Department deal with economic problems of the West. I regard the work of the Department and its services during the past year in the interest of the people of this section of the country as the most satisfactory since I became Secretary of the Interior three years ago."

Giving the New Settler a Chance

THE following letter is self-explanatory. It is published with the consent of Mr. Durrill as an example of what one private citizen is willing to do to make his purchasers successful, and as a practical demonstration of aided and directed settlement:

PAVILLION, WYO., *January 30, 1926.*

Mr. GEORGE C. KREUTZER,
Denver, Colo.

MY DEAR MR. KREUTZER: I have been reading articles and speeches made recently by such men as Senator Kendrick, Representative Winter, and yourself regarding reclamation and its ailments, and I must congratulate you and the others on their sensible policy. I believe and always have that the real success of reclamation projects is the selection of and financing the entrymen.

As I told you when in Denver some months past my intention was to get one or two good farmers whom I could depend on and to finance them and place them on some of my land. This has been a pretty hard job. I could find plenty who were willing to be financed but doubtful as to success. I have finally found a man named Kirby, whom I have known for years, and who is a good farmer and sheepman. He has a wife, three sons all large enough to do farm work, two daughters, good workers, and about $1,000 in cash.

I sold him the northwest quarter of section 13, and the east half of the northeast quarter of section 14, 3 north and 1 east, near Pavillion, 240 acres for $20 per acre on 10 years' time, at 6 per cent interest, no interest the first year. I am to loan him the money to build a house, buy fencing to fence the land, including woven wire for 80 acres for sheep pasture. He is to plant 40 acres of this to yellow sweet clover, and 20 acres to alfalfa this year. Will plant oats as a nurse crop. He is to haul material, and build house and fence at his own expense. I am also to furnish him three good milk cows, and all the money advanced by me is to be repaid in three years.

I am also to let him have on shares 350 good breeding ewes, 200 in October, 1926, and 100 in 1927; also 7 bucks. These are to be good aged ewes, and registered bucks, which will cost me about $6 per head for ewes, and $35 for bucks. I am to get one-third of the wool sacked at shearing pens, I to furnish sacks, also one-third of the lambs at the farm in October. He is to make loss of sheep good, and to return to me at the expiration of five years the same number of sheep and of no less value.

He is to pay 6 per cent interest on the land after the first year for 5 years, or to the sixth year, from the sixth to tenth year to pay interest and $250 each year on principal.

He will have 3 cows, 100 hens, 10 turkeys, 2 brood sows; and I do not see any reason why this man can not succeed, and I know he will. His sheep should shear 10 pounds of wool each at 30 cents per pound or $3 each, and kept on a farm should produce 100 per cent lambs, and at 70 pounds each lamb, at 10 cents per pound would bring $7 per head. The total income from sheep would be $3,500, his two-thirds would be $2,376, and as he sells his wool in the spring and lambs in the fall, he has two pay days each year.

With his chickens, turkeys, cows, and hogs they will nearly make their living, or a very large part of it.

They will commence building the house this week, and hauling out fence material. I have another piece of land near Pavillion I may make a similar deal on.

If the Government would make similar deals, with selected entrymen, and have a good farm boss, all money advanced by the Government invested by a committee along the lines of my deal, there would be, in my opinion, a different story to tell about the reclamation projects and repayment to the Government of money advanced.

Trusting you are getting along nicely with the settlement of this project, and that we will get an appropriation sufficient to go on with the work, I am, with personal regards,

Yours very truly,
M. S. DURRILL.

NOTE.—Two months later Mr. Durrill wrote to Mr. Kreutzer as follows:

I was away two months. On my return I brought back from Wisconsin 22 purebred and high grade Guernsey cows and heifers and one bull, a royally royal fellow. All cows and heifers will freshen this spring. I brought four of these to Mr. Kirby, to whom I sold the 240-acre tract that I wrote you about.

Reclamation Progress in Agro Romano Region

The Minister of National Economy of Italy has prepared recently an interesting report on the progress made in reclaiming the Agro Romano. Water courses have been regulated and the malarial peril has been greatly reduced.

Perhaps the most effective Government provision for the encouragement of colonization is the granting to approved colonists of Government loans at 2½ per cent interest instead of the regular 4 per cent, payable in 45 years, the first repayment not being made until 5 years after the granting of the loan. During the past three or four years especially, the Government has granted large sums under these conditions.

Selecting Settlers on Basis of Qualifications

(Continued from page 75)

selection of persons who desire to go on irrigated land in Government reclamation projects.

"I have had a great deal of personal experience with men who have come poorly prepared to farm under irrigation, and I am in a position to know that your plan of requiring certain qualifications of applicants is in the right direction.

"By this method you should be able to select men capable of handling farms and avoid those who are incapacitated for farm success, but who are looking for something to be given them by the Government.

"The provisions are reasonable and I can not see that any person can object to them. To those in charge of the project, and for any other agency that is working to aid the settler in developing his farm, these questionnaires will give a good background as to the farmer's ability and experience; a factor of considerable importance.

"I only wish that this precaution of getting the right kind of settlers on our projects had been taken earlier. I am sure, however, that this is a fine requirement, and will serve to make our reclamation projects much more successful."

FINANCIAL AID NEXT STEP

The selection of settlers on the basis of approved qualifications is the first step in laying the foundation for the success of new projects. The second should be the provision for furnishing these men with additional financial aid in the early years of development, and with the advice of trained agricultural advisers concerning their farming operations. Legislation looking to this end is pending in Congress, and its enactment will mean another material step forward in our work of placing reclamation on a business and paying basis.

THE Uncompahgre project reports that announcement has been made by the county clerk's office that, on account of the good year experienced in the valley as a result of the prices received for the 1925 crops, a number of farm mortgages have been paid off and there has been a decrease in the usual number of spring chattel mortgages to finance farmers in putting in crops.

New Contracts Between the United States and Reclamation Projects

THE act of December 5, 1924, amended the reclamation law and provided a new repayment plan for returning to the United States the construction costs of Federal reclamation projects. This act fixes the annual construction repayments at 5 per cent of the average annual crop returns over a period of 10 years or the years of record. Where the growing season is long and crops of high value are produced, the annual construction payments to be made by a water user will be greater than on some other project where the growing season is short and the crops grown have relatively low value.

Before the passage of this act, construction costs were repaid over a period of 20 years. The annual installments were fixed at 2 per cent of the acre cost of construction for the first 4 years, 4 per cent for the next 2 years, and 6 per cent for the remaining 14 years, regardless of the acre cost of construction or the value of the crops produced.

The act of December 5, 1924, also provides that water users who desire the more liberal repayment terms must take over the project through a legally organized irrigation district or water users' association and operate the irrigation system themselves.

The accompanying table shows the progress being made in making and completing contracts between the Department of the Interior and the various reclamation projects. The water users on projects who desire the benefits of the act of December 5, 1924, must make a request of the Department of the Interior for a new repayment contract followed by perfecting a legally organized irrigation district or a water users' association. The contract must first be approved as to form by the Secretary of the Interior, after which it is voted on by the water users, and then confirmed by court before it becomes effective.

In addition to making these new contracts for existing projects which are now constructed, the department must have repayment contracts in force before new projects authorized by Congress can be constructed. The table also shows the status of contracts with new projects.

The Water Supply On the Projects

Precipitation during the winter of 1925–26 has been considerably below normal throughout practically the entire West, and as a result the watersheds above most projects of the Bureau of Reclamation are deficient in snow cover. Reports as of April 1 indicate that very low summer natural flow is probable, but storage on hand or fairly certain to accumulate during the spring assures a reasonable water supply for practically all projects. The Okanogan, however, and the Truckee lands of the Newlands project may experience a severe shortage.

General storms occurring early in April in California and the northern Rocky Mountain region have greatly improved the situation and in many localities conditions have probably been restored to normal.

Colorado Potato Growers' Exchange

Announcement was made recently by the Colorado Potato Growers' Exchange that $56,000 held in the reserves as an accumulation from operations during the calendar year 1923 would be distributed to the growers. This sum represents the cooperative savings and the surplus from the first year's operations, and does not include the reserve accumulation of the 1924 or 1925 seasons. These reserves will be distributed later.

Status of new contracts between the United States and reclamation projects, April 15, 1926

Project	Division	Form of contract approved by Secretary of Interior	Election held by water users	Confirmatory proceedings by court. Date of decree	Date of contract	Purpose of contract
EXISTING PROJECTS						
Boise [1]	Nampa and Meridian Irrigation District.	Sept. 9, 1925	Nov. 10, 1925	Feb. 10, 1926	Mar. 2, 1926	Turning project over to water users, and making construction repayments on crop-return basis as authorized by act Dec. 5, 1924.
Do.[1]	Boise-Kuna Irrigation District	Jan. 14, 1926	Mar. 13, 1926			Do.
Do.[1]	Wilder Irrigation District	Feb. 10, 1926	Mar. 20, 1926			Do.
Do.[1]	Big Bend Irrigation District	Jan. 19, 1926	Mar. 9, 1926			Do.
Minidoka [1]	Burley Irrigation District	Feb. 1, 1926	Feb. 26, 1926		Mar. 15, 1926	Do.
King Hill [2]	King Hill Irrigation District	Oct. 9, 1925	Dec. 8, 1925		(3)	Do.
Umatilla	West Extension Irrigation District	Feb. 25, 1926	Apr. 10, 1926			Do.
Do	Hermiston Irrigation District	Mar. 22, 1926				Do.
North Platte	Interstate Division	Feb. 15, 1926				Do.
Sun River	Greenfields Irrigation District	Feb. 16, 1926				Construction Gibson Reservoir and providing for its repayment.
Yakima	Sunnyside Irrigation District	Mar. 25, 1926				New plan of repayment of construction costs.
Shosbone	Shosbono Irrigation District, Garland division.	Apr. 1, 1926				Turning project over to water users, and making construction repayments on crop return basis as authorized by act Dec. 5, 1924.
Strawberry	Strawberry Water Users' Association, entire project.	Sept. 17, 1925				Do.
NEW PROJECTS						
Yakima	Kittitas Reclamation District	Dec. 30, 1924	Feb. 11, 1925	Mar. 10, 1925	Dec. 19, 1925	Construction Kittitas division, Yakima project, and providing for its repayment.
Vale	Warm Springs Irrigation District	Sept. 14, 1925		Dec. 18, 1925		Purchase by United States of interest in Warm Springs Reservoir.
Baker	Lower Powder River Irrigation District.	Jan. 29, 1925				Beginning construction Baker project and providing for its repayment.
Salt Lake Basin	Echo Reservoir and Weber-Provo Canal.	Sept. 15, 1925				Construction Echo Reservoir and Weber-Provo diversion canal and providing for repayment.

[1] Water users took over project works on Mar. 25, 1926.
[2] Water users took over project works on Jan. 1, 1926.
[3] Not yet signed by Secretary pending confirmation.

Women on the Projects and Their Relation to Better Agriculture

The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life

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

A home on the Boise project, Idaho

Personality in the Home

IT is the home that is stamped as "being different" from the rest that has as its manager a woman whose ingenuity has prompted her to weave her personality into the making of her home, and the moment you enter the house you are in its environment. Its expression is in evidence everywhere, and can not be dimmed by the lack of funds or other handicaps.

The first thing that impresses one is its originality—it may be recognized in arrangement, color schemes, etc.

In addition to the effect on the visitor it is a great satisfaction to the one working out her ideas. The feeling must be akin to that experienced by the Navajo Indian woman weaving her story into a blanket, basket, or rug.

CHOOSING COLORS

One of the outstanding attractions of a home is the application of an intelligent and unusual use of color, whether it be for furnishing up an old house or adding the finishing touch to a new one.

The first thing to consider in selecting colors for a room is the exposure. Warm tones should be applied to a northern or eastern exposure, while a southern or western exposure would call for colors to offset the effect of sunshine. After you have selected your predominating color, your imagination will suggest contrasting and related colors.

DRAPERIES AND HANGINGS

There is no better place for a display of good taste than in your selection of these. Their texture must be such as to hang in graceful lines and their color beautifully contrasting and harmonious.

CURTAINS

The life of general draperies is somewhat longer than that of curtains for the windows, which generally have to be renewed every few years.

In planning curtains keep in mind that windows are put in houses in order to admit light and air. Make your curtains as simple as effectiveness will permit. Elaborate curtains defeat the purpose of windows and are out of place in the average home.

Look carefully at the shape and size of the windows and how they are placed in the walls. Picture the effect of curtains of various styles on those particular windows and how they will appear from the outside as well as the inside of the house. If there are lovely views from the windows, study how to keep these without sacrificing privacy and an attractive interior. An unattractive view may need to be screened by curtains, but beware of shutting out too much light.

Study the general style of your room. Curtains can help to make a room homelike and inviting or dignified and formal, depending on the kind of material used and how it is hung.

Side draperies give a finished appearance to the window and are a good means of adding color to the room. In small homes, side draperies that end on a line with the apron of the window are more suitable. If a more formal effect is desired, let them extend to the baseboard or an inch above the floor.

Before buying curtain material get samples of the kinds that seem most suitable and see how they go with walls, woodwork, floor, and furniture by both day and artificial light. Strong light shining through curtain fabrics often brings out striking effects not suspected until put to this test. Excellent curtain materials can sometimes be found among the dress goods.

Fabrics and colors that will clean well and withstand light are the best bargain in the end. Examine also for defects in the weave that may show up when the curtains are hung.

With figured wall paper, choose plain-colored curtain material. If the walls and most of the furnishings are plain, the curtains may be figured, but preferably with the background the same color or slightly deeper than the walls. With cream walls, for instance, a cretonne with soft tan background and figures that repeat the colors used elsewhere in the room might be suitable for living and dining rooms.

In selecting figured materials give preference to conventional designs that will stand the test of being looked at day after day.

Sprawling designs make the window look shorter and broader, and stripes tend to increase the height and if used in excess give a stiff uncomfortable effect.

Measure the windows with care before buying the material. Accuracy in cutting and neat sewing go a long way toward insuring well-hanging curtains.

Project Women and Their Influence in the Home and on Farm Life

Economists are unanimous in stressing the important place occupied by women in rural life, and the value of their work in making homes out of mere dwelling places and in building up the morale of a community

Readers' Comments and Suggestions

My article in the last issue giving the farm-bred girl her innings and stating the shortcomings of the city-bred girl in the matter of making a contented and happy home on the farm brought a number to the defense of the girls in the cities.

One letter, from a man, reads:

"I feel that I should take some exception to the first article which contains something of a slam on the town-bred woman. Each day as I view the vast army of town-bred women going to and from their employment, the thought arises in me how much better it would be if many of them were married to honest farmers working good reclamation farms. There must be very many of them who would be willing to change from a two-room apartment to the wide horizons of the West, and they ought all to have a chance. Most of them would make good and industrious wives and mothers, and the opportunity to fulfill their destinies should not be closed against them on the reclamation projects. They would soon adjust themselves to the new conditions. I am speaking for the honest, thoughtful sensible girls who exist in large numbers in all of our cities."

Another letter, from a woman, reads:

"If the RECLAMATION ERA wishes to serve the project families, one of the best means for doing so, it seems to me, would be to publish articles or letters telling how to insure health and guard against disease. Many of the homes are remote from towns, and often there must be many hours' delay in securing the aid of a physician. In many cases, too, economic conditions are such that calling a doctor is not to be considered unless the need is very urgent.

"In many of these homes the RECLAMATION ERA is the only periodical that comes, because of the lack of money for subscriptions to others.

"I would suggest articles on diet, practical and nontechnical (avoiding such terms as calories, carbohydrates, nitrates); articles on how to dress children in the various seasons; how to prevent colds in children; on the ventilation of houses; on the symptoms of 'flu,' pleurisy, measles, etc., and the proper care of patients. The number of subjects that could profitably be treated is legion."

"I should also particularly like to see a department for boys and girls in the ERA. Much could be done to make them interested in the life around them and to make them love it. They could be led to feel a sense of responsibility in helping to build up the new home, to help to make the most of their materials, to keep the home and premises clean and orderly."

"A great work could be done, too, in teaching the right care and treatment of animals. Humane societies have not extended their influence to some of these localities, and in many instances neglect of the proper attention to the care of animals is most deplorable."

These suggestions are all good, and in future issues I will endeavor to broaden out into these subjects.

Try This

POTATO CAKE

1 cup butter.
½ cup grated chocolate or cocoa.
2 cups sugar.
½ cup milk.
½ cup English walnut chopped.
2 cups flour.
4 eggs.
3 teaspoons (even) baking powder.
1 teaspoon nutmeg.
½ teaspoon cloves.
½ teaspoon allspice.
1½ teaspoons cinnamon.
1 teaspoon lemon and vanilla mixed.
cup mashed Irish potatoes seasoned for the table.

All measurements even.

METHOD

Cream butter and sugar, add chocolate, eggs beaten together, flour sifted with baking powder and spices. Add nuts and potatoes and extracts. Bake in slow oven.

National Reading Circle A Real Opportunity

The Bureau of Education sends on request, and without any charge, reading courses as follows:

Course

1. Great Literary Bibles.
2. Masterpieces of the World's Literature.
3. Reading Course for Parents.
4. Miscellaneous Reading for Boys.
5. Miscellaneous Reading for Girls.
6. Thirty Books of Great Fiction.
7. Thirty World Heroes.
8. American Literature.
9. Thirty American Heroes.
10. American History.
11. France and Her History.
12. Heroes of American Democracy.
13. The Call of Blue Waters.
14. Iron and Steel.
15. Shipbuilding.
16. Machine Shop Work.
17. Foreign Trade.
18. Reading Course on Dante.
19. Master Builders of To-day.
20. Teaching.
21. Twenty Good Books for Parents.
22. Agriculture and Country Life.
23. How to Know Architecture.
24. Citizenship and Government.
25. Pathways to Health.
26. Sixty Selected Stories for Boys and Girls.
27. Poetical Literature for Boys and Girls.

If you wish to enroll in this or any other of the courses issued by the Bureau of Education, address your request to The Commissioner, Bureau of Education, Department of the Interior, Washington, D. C., being careful to give the name and number of the course desired. If you live in any one of the following States, instead of returning the application to the Bureau of Education send it to the address given for your State:

Arizona: A. O. Neal, Extension Division, University of Arizona, Tucson, Ariz.

Colorado: Elmore Peterson, Extension Division, University of Colorado, Boulder, Colo.

North Dakota: Albert H. Yoder, Extension Division, University of North Dakota, Grand Forks, N. Dak.

Oregon: Dan E. Clark, Extension Division, University of Oregon, Eugene, Oreg.

South Dakota: John C. Tjaden, Extension Division, University of South Dakota, Vermilion, S. Dak.

Utah: F. W. Reynolds, Extension Division, University of Utah, Salt Lake City, Utah.

Washington: F. F. Nalder, Extension Division, State College, Pullman, Wash.

The bureau awards certificates on completion of each reading course. These courses are not only for children but for adults.

In an address before Rotarians in Education, Washington, D. C., February 24, 1926, Dr. Hubert Work, Secretary of the Interior, said: "A man is nothing more than a possibility. It is his reaction to opportunity that fixes his place in the world."

Here is the opportunity right "at your door." These certificates should be highly prized and ought to arouse quite a little competition in their procurement.

Agriculture and Wild Fowl Conservation at Lower Klamath Lake

Can aquatic bird life be conserved and agriculture be developed at the same time within the area of lower Klamath Lake and marshes?—A short story of the agricultural and biological conditions

By Copley Amory, Expert in Reclamation Economics, Bureau of Reclamation

OUR topic concerns the Klamath Drainage District in Oregon and efforts to establish agriculture there on its drained marsh and lake bed lands on one hand; and the proposal to reestablish conditions favorable for wild-fowl conservation on the remaining part of the lower Klamath Lake area on the other.

The Federal reclamation project, known as the Klamath reclamation project, lies partly in California and partly in Oregon. (Map 1.) That portion of the Klamath reclamation project, known formerly as lower Klamath Lake division, lies in the western portion of the Klamath reclamation project, and is partly in Oregon and partly in California. (Map 2.) The Klamath drainage district is that portion of the former lower Klamath Lake division which lies in Oregon excepting that portion of marsh land which lies west of the railroad dike. (Map 2.)

On the line of division between Oregon and California was formerly lower Klamath Lake and its surrounding marsh lands, aggregating about 80,000 acres and of which about two-thirds was marsh, and one-third water. (Map 2.)

AGRICULTURE OF LOWER KLAMATH LAKE AREA

THE Southern Pacific Railroad built a dike or causeway across the upper end of these Klamath marshes in which gates were placed at the instance of the Reclamation Service to regulate or exclude, under control of the Federal Government, the waters of the river from the lake and marsh.

After the year 1918 the exclusion of the river water from the lake and marsh area of the Klamath drainage district lowered the lake levels and began the drying up of the marshes. Continued exclusion of the river water and the constant evaporation from the lake surface continued until now only a remnant of the former lake remains. The former lake is now reduced in surface area from about 40 square miles and from a depth of approximately 13 feet to a mere sump of about 3 square miles and 5 feet in depth, of which the water now is practically free from alkali.

The land thus drained is of two kinds, a peat soil composed of accumulated remains of aquatic plants generally similar in kind to peats found elsewhere and the lake-bed land composed of a claylike soil. This soil is in part the remains of a primitive vegetable plant or diatom which, when soaked with water, has the consistency of jelly, and is incapable of supporting the weight of a man, and when dry the character of horn, forming a hard soil. It is termed diatomaceous colloidal, and into it very little alluvium has been carried with inflowing waters.

The climate is northern and liable to frost in June and September. There is a good growth of timber in the adjacent mountains and grass for grazing on the surrounding plains. The region is served with ample railroad facilities connecting it with Portland on the north and San Francisco on the south. Klamath River affords a considerable hydroelectric development. The upper river's flow is largely controlled by the surplus water of Klamath Lake. Before the drainage of lower Klamath Lake the water level of these 80,000 odd acres acted as a regulating reservoir for Klamath River.

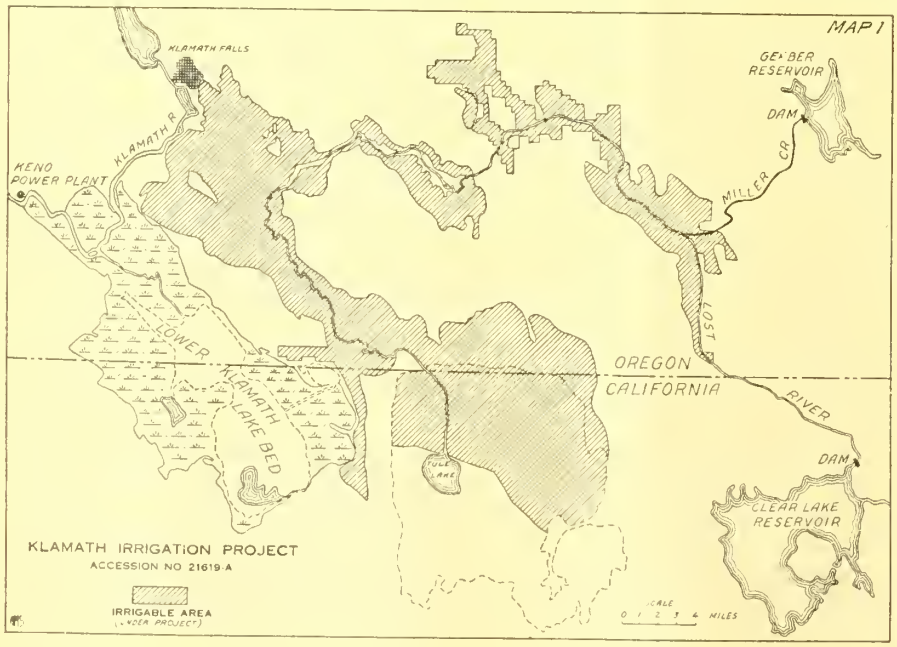
The beginning of agricultural development of this region dates from the early settlement of Oregon. Soon after passage of the Federal reclamation act in 1902, reclamation engineers found one of the most complex problems of all reclamation projects in this Klamath project as a whole, for—

"it contains an irrigation problem, an evaporation problem, a run-off problem, any one of which is difficult in itself but all of which taken together form a most perplexing whole. In nearly all of the reclamation projects water has to be conserved. In this project there is more than enough and the question of disposing of it becomes an important part."

To this array of difficulties in creating the Klamath reclamation project as a whole should be added the particular agricultural problems of lower Klamath Lake, the solution of which has been the purpose of the Klamath drainage district to solve. These agricultural problems presented themselves after the major engineering problems had been solved and their execution completed. They are the adaptation of crops to the particular and individual soils and climate of the Klamath drainage district.

The Klamath drainage district is an organization under State laws which provide a cooperative means of securing credit and establishing drainage and irrigation work for agriculture.

Under a contract between this Klamath drainage district and the United States the drainage district undertakes to pay the Government $104,898.15 and to reclaim by drainage approximately 27,000 acres of land, and in its performance exercise due diligence. A supplementary contract between the same parties provides that the United States shall for an additional consideration furnish water for irrigation for the land which is to be drained and which will in turn have to



be irrigated. The seepage water resulting from this irrigation must find its way by gravity to the sump of the lake. (Map 2.)

The Klamath drainage district has faithfully performed its terms of the contract in respect both to its payments and to due diligence in prosecution of its agricultural experiment.

What knowledge and experience have been acquired and what utilization has already been made of the lands designated for drainage and irrigation, while complying with the contract, are still insufficient to foretell what degree of success will in the end be attained, or to what extent the former lands of the lower Klamath Lake area will be appropriated for agriculture,

Seldom has the adaptation of crops to soil, consideration of late and early frosts, and drainage, irrigation, and the necessity for drainage of seepage water offered such difficult problems in combination, as are presented in the lands of the Klamath drainage district. Its solution must therefore be drawn from the advice of agricultural experts and from experience involving time and the expenditure of capital.

That portion of the district composed of peat soils has proved its fitness for pasture meadows and has produced abundant crops of rye and in less degree of other grains, and there is reason to assume that when water level conditions are better understood and controlled, these peat soils will prove profitable for alfalfa. It can be said of these peat soils that the farmers upon them have created an agricultural land asset. It is probably true also that with additional time and experience these assets will increase in value.

Less has been accomplished in experimentation and proof of the value of the soil of the lake bed. It produces, with abundant moisture, abundant weeds. It has produced a vigorous growth of barley and oats which in 1925 was not matured and harvested but fed to pasture. It can be said of this colloidal soil that it is unusual in its chemical and physical character, and we can not cite an example of the successful cultivation of a soil of similar character. In the Sandwich Islands a somewhat similar, but not a similar, colloidal soil has been "planted to cane and with indifferent results."

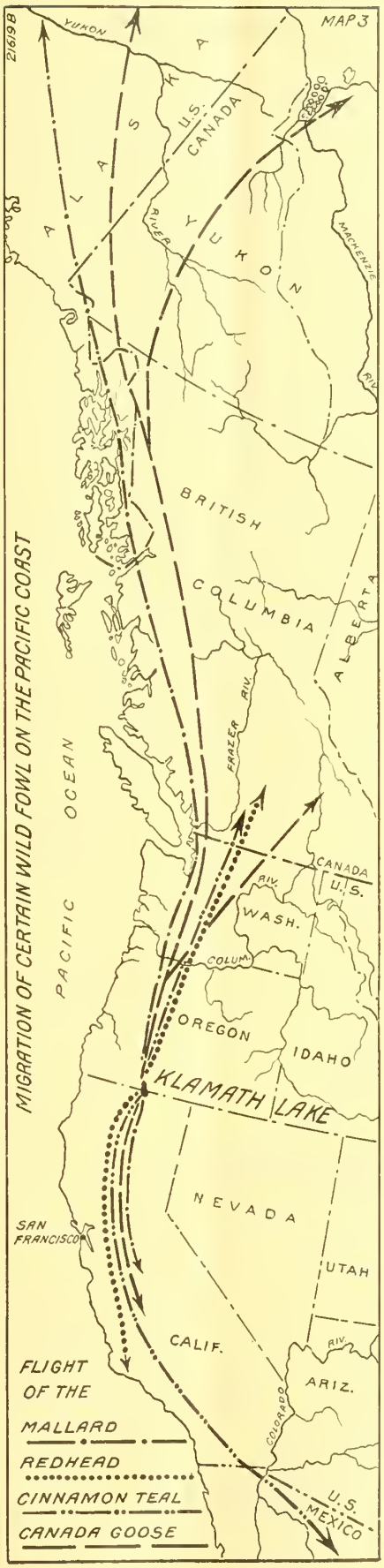
Inasmuch, therefore, as the Klamath drainage district has performed its terms of the contract with the United States, it becomes the obligation of the United States to respect the terms of the contract. It is, furthermore, a necessary part of good faith to refrain from any act which will impair the credit of the Klamath drainage district.

A condition resulting from the drainage of the marshes is the drying out of a vast area of peat with its consequent liability to fire. As the development of irrigation proceeds, water from the irrigation canals will diminish this fire risk.

From these facts then, we find that an effort is being made by an organization directed by responsible and experienced cultivators, to cause two blades or more of grass to grow where none grew before. The difficulties are such that time and money are necessary to determine how far the lands under experiment are or are not agricultural lands.

In consideration of the contractual obligations of the two parties of the contract, the Government and the Klamath drainage district, time should be allowed in which to come to a final and fair conclusion.

If the lake bed area is nonagricultural, when it shall have been so demonstrated, consideration of some other use of the lower Klamath Lake bed area will be in order.



WILD-FOWL CONSERVATION

In 1908 President Roosevelt issued an Executive order creating Klamath Lake reservation, in order to protect the multitude of varied bird life of lower Klamath Lake, "subject," however, "to the use of any part of the reserved area by the Reclamation Service."

Quoting from the Volt:

"The wild-fowl nurseries of Klamath County are an outstanding feature of the region. Except on the Gulf of Mexico nothing was comparable with the refuges and breeding grounds of the Klamath Lake region. Numerous ducks, including mallards, pintails, canvasbacks, gadwalls, mergansers, cinnamon teal, and ruddy ducks, were among the former inhabitants of lower Klamath Lake. The marshes were also the homes of Canada geese, sandhill cranes, bitterns, coots, and rails. Along the mud flats were avocets, stilts, phalaropes, snipe, killdeers, and other waders. On the lakes were colonies of numberless gulls, night herons, and great blue herons, cormorants, grebes, terns, and pelicans"

Mr. and Mrs. William L. Finley, of the National Audubon Society, than whom no one is better qualified to speak of the former conditions of bird life in this region, say:

"In the past the birds of Klamath County have been a factor in its development. Back in the nineties, when market hunting was in vogue, a hundred and twenty tons of ducks were shipped from this section during one winter season to the San Francisco markets. The plumage of untold thousands of grebes, terns, and other beautiful birds was sent to the

(Continued on page 82)

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Conservation at Lower Klamath Lake

(Continued from page 81)

millinery markets of New York and Paris. The days of the market and plume hunters have passed into the period of the sportsman and tourist. Each year more wild land is brought under cultivation; swamps, ponds, and lakes are drained, forests are cut, and fields feneed. These activities are of great importance to the State. As Klamath County develops, if some attention is paid to nesting, feeding, and resting refuges for our wild birds, their variety and number can be retained even under the change of conditions. Klamath County is one of the great outdoor lands of the West. Conserving its remarkable bird life will prove a valuable future asset for a desirable class of tourists who have money to spend and money to invest."

Now, owing to the drainage of the waters this bird life has almost disappeared.

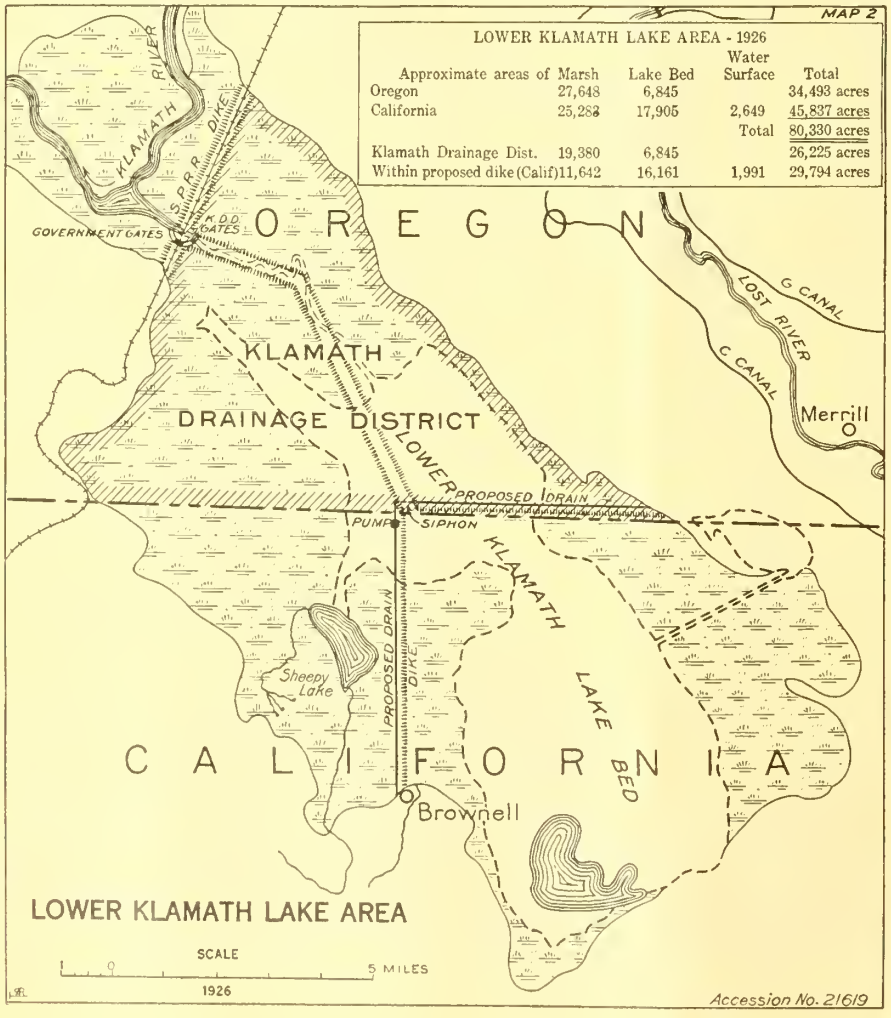
In recent years the small area of water already described as the remaining portion of lower Klamath Lake or the sump has been the temporary resting spot for a multitude of ducks. So numerous were they in proportion to the diminished lake area that a pollution of the water has resulted and a disease of the ducks followed. This disease has produced a great mortality of ducks. The accompanying illustration shows a multitude of ducks awaiting a chance to drink and rest upon a water area insufficient for their accommodation.

Such, then, is the importance of lower Klamath Lake for wild-fowl conservation. The interest of the sportsmen of California is involved. The loss of the region for them for the conservation of wild fowl has and will continue to be felt until some other region adapted to the needs of wild-fowl conservation is found and developed.

Agriculture has already beeome established in Klamath drainage district and independently upon other parts of the peat lands.

Two factors will therefore determine the possible course of wild-fowl eonservation: The extent of future agricultural development and the cost involved in the establishment of sanctuaries.

While these questions are unsettled it is proposed to dike that portion which is not now put to beneficial use. Such diking is neeessary in order to carry away,



Concentration of ducks caused by drainage of their feeding grounds

impound, and dispose by evaporation of the seepage water flowing from the Klamath drainage district and to prevent the restored water in the lake from drowning out agriculture in the Klamath drainage district. This seepage water must be pumped over the dike and would become an annual recurring charge against wild fowl conservation.

These two charges taken together probably exceed the expectation of casual estimates of cost, but the conservation benefit which would result would probably, on the other hand, prove very material.

Besides the element of cost the consideration of an accumulating increase of alkali within the dike region should be taken into account.

Pending determination of the course to be followed at lower Klamath Lake and irrespective of its conclusion, prudence would seem to dictate an effort to find and develop other areas for sanctuaries within the United States and within the line of flight (map 3) where the cost as compared with the benefit would promise equal or better results than now appear probable at lower Klamath Lake.

If an alternative area or areas prove available and besides them a portion of the lower Klamath Lake is developed, conservation would not then provide the rising generation in California with a supply of wild fowl equal to that of preceding generations.

Cotton Production on the Projects

Cotton grown on the Federal irrigation projects

Project	Acreage	Unit of yields	Yields				Value	
			Total		Average per acre		Total	Per acre
			Lint	Seed	Lint	Seed		
Salt River	82,780	Lb.	31,076,267	62,152,533	375	750	$8,888,511	$107.37
Yuma	33,408	Lb.	13,309,942	26,619,884	398	796	3,061,286	91.60
Orland	64	Lb.	8,333	16,667	130	260	5,625	87.90
Carlsbad	18,342	Lb.	4,765,760	9,280,710	260	506	1,210,879	66.00
Rio Grande	81,373	Lb.	33,851,168	55,690,000	416	684	8,226,917	101.10
Totals and averages	215,967		83,011,470	153,759,794	384	712	21,393,218	98.13

MORE than one hundred and sixty-six thousand 500-pound bales of cotton, valued at $21,393,000, were grown last year on five Federal irrigation projects.

A recent compilation shows that cotton was grown on 215,967 acres on the Salt River project, Arizona; Yuma project, Arizona-California; Orland project, California; Carlsbad project, New Mexico; and Rio Grande project, New Mexico-Texas. The yield from this acreage amounted to 83,011,470 pounds of lint and 153,759,794 pounds of seed, an average of 384 pounds of lint and 712 pounds of seed per acre. The total value of the crop amounted to $21,393,218, or $98.13 per acre. The value of the cotton crop represented more than 27 per cent of the total value of all crops grown on the Federal irrigation projects during 1925.

The value of the crop on the Salt River and Rio Grande projects amounted to more than $8,000,000 each and to more than $100 an acre. For the first time cotton was grown on the Orland project in California, where 64 acres were planted as an experiment. From this acreage cotton to the value of $5,625 was grown, or an average of $87.90 an acre.

The accompanying table shows the statistics in detail for the five projects.

ALL of the rights of way for the first 4 miles of the main canal, Kittitas division of the Yakima project, have been secured by the Kittitas Irrigation District, and on March 31 a contract was signed by the president and secretary turning over these rights of way to the United States at a total cost of $6,615. The work of securing options and deeds for the remainder of the right of way for the canal has been practically completed.

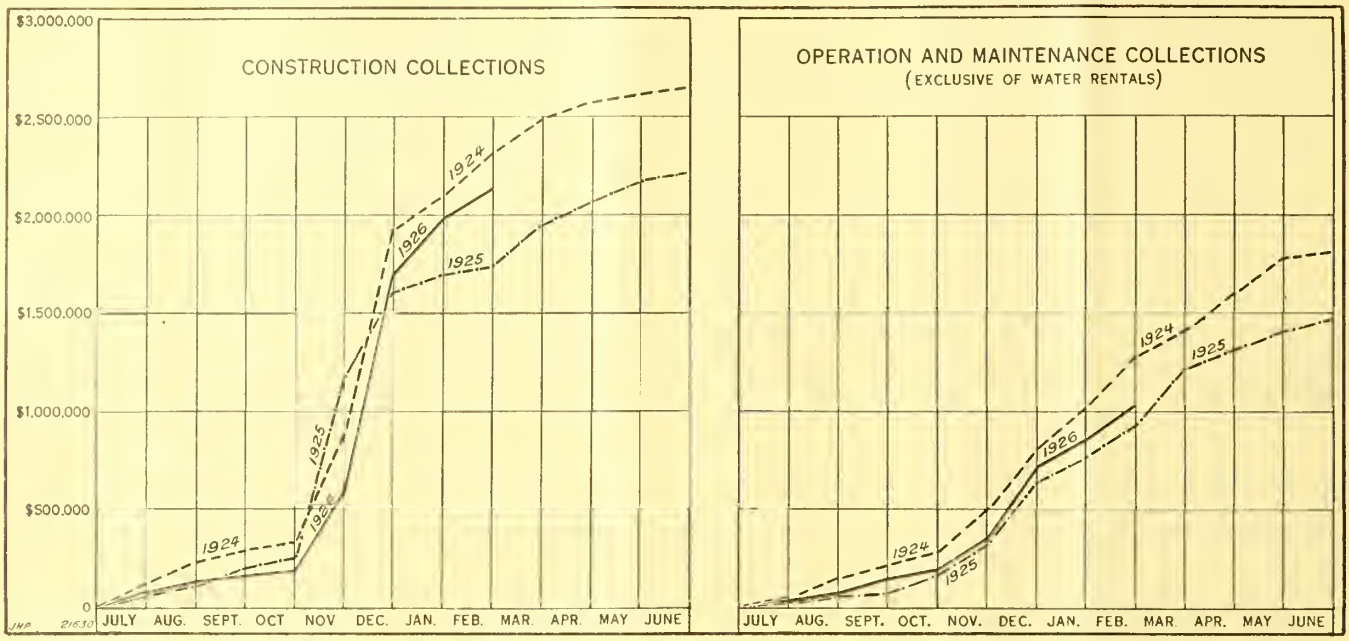
Potatoes on the Reclamation Projects

POTATOES ON RECLAMATION PROJECTS, 1924–1925

Project	Year	Acreage	Yield	Value	Per acre value	Per acre yield
			Bushels			*Bushels*
Salt River	1924	242	20,167	$36,300	$150.00	83.3
	1925	305	40,667	48,800	160.00	133.3
Yuma	1924	0	0	0	0	0
	1925	1½	50	90	.60	33.3
Orland	1924	4	500	900	225.00	125
	1925	5	665	1,200	240.00	133
Grand Valley	1924	744	98,230	85,924	115.48	132
	1925	791	122,555	162,885	206.00	155
Uncompahgre	1924	7,624	1,214,380	334,587	43.88	159.2
	1925	5,154	1,089,990	948,249	183.98	211.5
Boise	1924	5,103	754,373	297,835	54.44	147.8
	1925	2,583	1,156,346	444,004	171.90	447.6
King Hill	1924	238	24,840	14,544	61.10	104.3
	1925	143	20,277	18,007	125.60	141.4
Minidoka	1924	6,551	1,177,949	588,974	89.90	179.8
	1925	6,945	1,682,115	2,270,855	326.97	242
Huntley	1924	21	1,610	1,611	76.71	76.6
	1925	26	2,723	4,734	181.92	104.3
Milk River	1924	56	6,616	5,916	105.64	118.1
	1925	[1] 106	17,862	33,316	323.73	159
Sun River	1924	219	17,327	13,350	60.95	79.1
	1925	237	32,620	48,930	206.45	137.6
Lower Yellowstone	1924	110	11,650	6,990	63.54	105.9
	1925	128	13,355	20,032	156.50	104.3
North Platte	1924	6,351	1,011,460	406,017	63.92	159.2
	1925	5,677	1,092,801	1,147,440	202.12	192.4
Newlands	1924	273	22,630	22,633	82.89	82.8
	1925	152	20,533	27,720	182.36	135
Carlsbad	1924	0	0	0	0	0
	1925	7	300	380	54.29	42.8
Rio Grande	1924	0	0	0	0	0
	1925	3	450	720	240.00	150
Umatilla	1924	66	6,290	6,917	104.80	95.3
	1925	108	10,150	12,383	114.66	94.2
Klamath	1924	450	46,560	41,904	93.12	103.5
	1925	818	95,491	128,912	157.59	116.7
Belle Fourche	1924	81	5,340	5,339	65.91	65.9
	1925	93	12,206	18,309	196.87	131.4
Strawberry Valley	1924	414	42,498	31,874	76.99	102.6
	1925	227	27,635	38,185	168.22	121.7
Okanogan	1924	28	3,695	4,434	158.35	132
	1925	21	2,010	3,618	172.29	95.7
Yakima	1924	7,494	2,098,690	1,443,698	192.64	280
	1925	8,383	2,411,870	3,135,431	374.14	287.7
Shoshone	1924	1,601	169,180	75,490	47.15	105.6
	1925	1,257	202,002	196,630	156.43	160.7
Totals	1924	37,670	6,733,985	3,425,237	90.93	178.7
	1925	33,170	8,054,673	8,710,830	262.61	242.8

[1] 17.6 acres of certified seed

Place Your Project in the "Blue Ribbon" Class



Collections for construction and operation and maintenance, fiscal years 1924, 1925, and 1926

THE reclamation policy of the Federal Government was adopted as the result of the act of June 17, 1902, which provides that the proceeds from sales and leases of the public domain should be placed in a special fund to be used for the construction and operation and maintenance of irrigation works for the reclamation of arid lands, the cost of construction and operation and maintenance to be returned to the fund through assessments against the lands benefited.

SOURCE OF THE FUND

During the first 10 years of operation under the reclamation law almost all the money available for the reclamation of arid lands was derived from the sale and lease of the public domain. Of the money available for reclamation from 1902 to 1925, 72 per cent was derived from the sale of public lands, oil-leasing royalties, etc., and 28 per cent from repayments by the lands benefited and from incidental operations by the Bureau of Reclamation. The receipts from the sale of public lands have greatly decreased since the inauguration of reclamation. There was deposited to the fund from this source during the fiscal year 1925 only $760,000 as compared with the maximum annual deposit of $9,400,000 in 1908; likewise there has been a decided decrease in the receipts from oil-leasing royalties which were made available for reclamation by the act of February 25, 1920.

(Continued on page 85)

Federal irrigation projects: Comparative collections

State	Project	Construction				Operation and maintenance			
		February 1925	February, 1926	Fiscal year 1925 to Feb. 28, 1925	Fiscal year 1926 to Feb. 28, 1926	February, 1925	February, 1926	Fiscal year 1925 to Feb. 28, 1925	Fiscal year 1926 to Feb. 28, 1926
		Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Arizona	Salt River			599,326	643,862				
Arizona-California	Yuma	10,902	31,929	327,835	321,967	116,729	112,895	245,210	178,504
California	Orland	3,049	2,227	19,463	71,108	2,690	563	22,412	31,499
Colorado	Grand Valley [1]					1,455	2,939	26,873	36,420
	Uncompahgre	622	9,251	23,846	62,914	4,474	8,571	67,761	87,882
Idaho	King Hill							71	161
	Minidoka:								
	Gravity	11,208	10,274	55,677	86,198				
	South side pumping	1,319	3,902	28,563	61,693	4,920	2,267	34,257	44,038
	Jackson Lake		1,102	31,646	39,982			9	111
Idaho-Oregon	Boise	861	222	141,627	114,167	11,804	734	68,448	118,191
Montana	Huntley	319	665	16,529	20,339	597	584	25,047	26,348
	Milk River [1]					4,949	716	12,464	10,512
	Sun River:								
	Fort Shaw	154	506	6,123	6,023	571	547	6,198	6,308
	Greenfields [1]					1,237	686	10,513	12,304
Montana-North Dakota	Lower Yellowstone	64	209	2,626	10,516	185	601	2,626	10,516
Nebraska-Wyoming	North Platte:								
	Interstate	48	868	24,090	19,126	274	1,599	36,472	36,042
	Fort Laramie [1]							27,068	33,106
	Storage	88	3,207	30,945	17,159	706	485	6,217	2,584
	Northport							22,748	23,381
Nevada	Newlands	660	4,982	30,195	45,533	4,687	7,602	70,854	99,155
New Mexico	Carlsbad	5,950	2,939	63,229	43,136	5,433	3,143	60,683	33,921
New Mexico-Texas	Rio Grande			33,850	118,194		7,088	48,499	72,683
Oregon	Umatilla			5,730	257	2,939	30	17,475	7,900
Oregon-California	Klamath	189		58,297	31,854	4,619	246	49,158	36,014
South Dakota	Belle Fourche								
Utah	Strawberry Valley	9,352	12,158	62,404	80,620	5,855	6,055	23,615	29,560
Washington	Okanogan		13	221	223	37	3,510	895	10,007
	Yakima:								
	Sunnyside	1,472	54,571	45,413	108,059	3,458	24,089	14,283	56,396
	Tieton	5,997	9,986	94,523	135,678	4,149	5,856	62,093	61,611
	Storage	60	60	20,375	75,615			18,050	15,800
Wyoming	Shoshone:								
	Garland	399	3,415	8,199	21,866	1,882	7,007	11,282	31,623
	Frannie							446	
Total		52,713	152,386	1,730,732	2,136,089	183,650	197,813	991,718	1,112,577

[1] Project on water rental basis.

Place Your Project In "Blue Ribbon" Class

(Continued from page 84)

THE FUND MUST REVOLVE

To perpetuate the Federal reclamation policy the revolving feature of the fund must be accelerated by the water users assuming their financial responsibility to the Government. During the period immediately following the readjustment of repayments under the extension act of August 13, 1914, to June 30, 1920, payments by the water users were generally satisfactory. Beginning with the fiscal year 1921, however, the unpaid charges for construction and operation and maintenance increased from $1,200,000 to the staggering total of $9,170,000 on June 30, 1925. This falling off in collections resulted in part from the operations under the various relief laws. While some water users have made heroic sacrifices to pay their debts, others, because of the blanket feature of the relief and an absence of necessary individual scrutiny, have been chronic evaders, not only refusing to pay charges they were amply able to meet but using their influence to induce other settlers to oppose these payments.

BLUE RIBBON WATER USERS

Many water users take pride in raising blue ribbon stock, cattle, pigs, and poultry; others in growing blue ribbon agricultural and horticultural products and making display at the annual county and State fairs. Such efforts are commendable and will go far to perpetuate reclamation. The success of a project, however, can not be measured entirely by its production. The financial showing of the return of the Government's investment must be considered. This can be accomplished by individual and joint financial responsibility to the Government on the part of the water users' associations and irrigation districts.

The accompanying tabulation and graphic charts show the results for the fiscal years 1924, 1925, and 1926.

A NUMBER of carloads of potatoes from the Shoshone project have been sold at fancy prices. One farmer sold a carload at $4 per hundredweight, receiving more than $1,400 for the car. A carload of second-cutting alfalfa from the Frannie division sold recently on the Kansas City market at $25.50 per ton, bringing $12.50 per ton net to the grower. This is stated to be the highest price paid this winter at that market for Wyoming hay.

Good Progress Made at McKay Dam

WORK on placing the concrete paving on the upstream face of McKay Dam, Umatilla project, Oregon, was resumed in March after an interval of nonactivity on this feature since October, 1925. During this latter month about 2,000 cubic yards of the paving had been placed at the upstream toe of the dam, because, there was very little flow of water in McKay Creek at that time to interfere with the paving operations. The concrete placed then brought the top above high water and permitted the early resumption of paving work this spring. The work was planned in this manner to permit the embankment to settle and compact as much as possible before placing the remainder of the concrete paving. A section for the concrete paving measuring 80 feet up and down the 1¾ to 1 upstream slope was prepared for the full length of the dam at this elevation, which measured about 1,500 feet A 24-foot narrow gauge track was constructed along the slope at the top of the section, and the concrete mixer was placed on a level with the track at the left abutment. Sand and gravel were stocked in piles near the mixer, which was charged by hand labor with the use of wheelbarrows. Cement was received from the mill at Lime, Oreg., in shipments arranged so that the cement could be unloaded from the cars at Sparks and hauled directly to the mixer at the dam, saving a rehandling charge. The concrete was mixed in a motor-driven ½-yard Jeager mixer, the actual mixing being accurately timed at one and one-fourth minutes per batch. The mixed concrete was hauled from the mixer along the slope in ½-yard cars by Ford automobile engines mounted on car trucks. The mixed concrete was chuted down the slope and placed in vertical panels 12 feet wide. Alternate panels were placed first, and after these were sufficiently set to work on, the intermediate panels were placed.

Forms of 2-inch lumber were placed on top of the reinforcing steel at the proper intervals to form the panels, the top of the forms being set to the finished surface of the concrete. Six men were used in placing the concrete after it left the chute on the slope. The chutes were made in about 8-foot sections and were removed as the concrete paving was brought up the slope. Four good husky men were required in bringing the finishing board up the slope over the freshly placed concrete. The finishing board was made of two 2 by 6s formed in the shape of an L' and rested on top of the wooden forms previously mentioned. Four additional men are used in finishing with wooden trowels. The finishers use an average of 1 cubic foot of mortar, in addition to that in the concrete, for finishing every 80 square feet of surface. After pouring, the concrete is protected from the direct rays of the sun for at least 24, hours after which time it is kept damp by sprinkling for 10 days. During the month 3,600 cubic yards of concrete were placed at a unit cost of $14.70 per cubic yard. This cost is comparable with the estimate of $15.25 per cubic yard. Six sacks of cement per yard of concrete were used during the month. The sand was shipped in from Hermiston, a distance of 42 miles, by railroad, and hauled by truck 2½ miles to the mixer. The cost per yard of sand at the mixer is $2.50. Gravel was washed, crushed, and screened in the valley about 1 mile upstream from the dam. The gravel was charged out at $1.80 per cubic yard.

Farm Population Shows Decrease During Year

A continued decrease in farm population in the United States is reported by the Department of Agriculture, which estimates that there were 479,000 fewer people on farms January 1 this year than on January 1 a year ago.

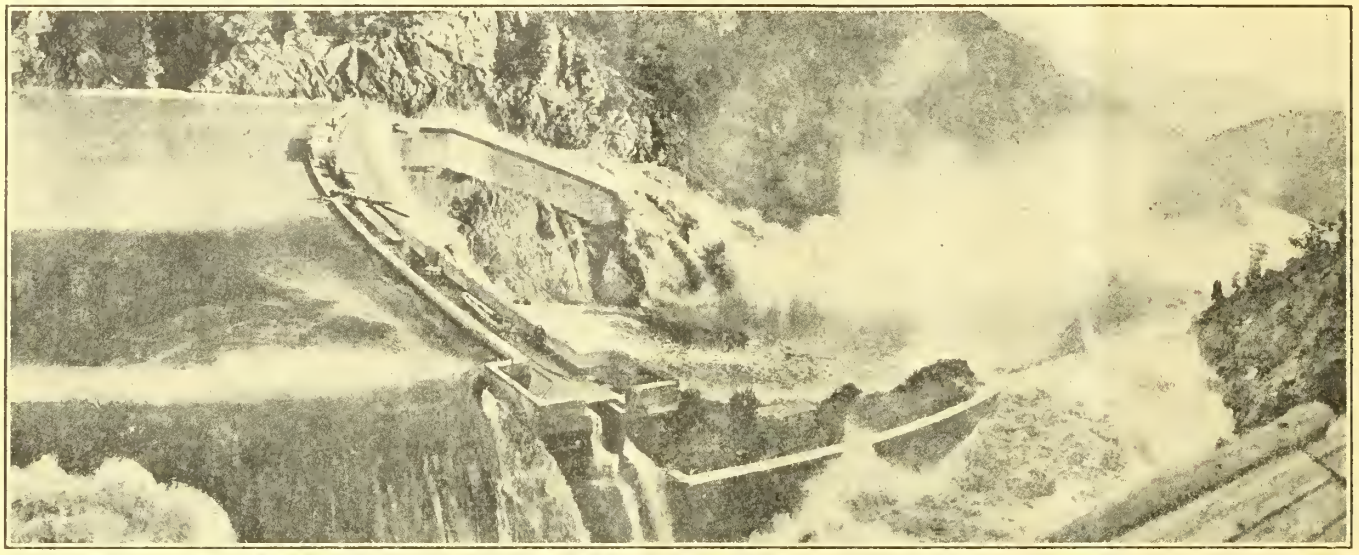
The department estimates the farm population at 30,655,000 on January 1, 1926, compared with 31,134,000 on January 1, 1925, a decrease of 1.5 per cent. These figures include all men, women, and children living on farms.

The movement from farms to cities, towns, and villages in 1925 is estimated at 2,035,000, and the movement to farms at 1,135,000, a net movement away from farms of 901,000. Births on farms during 1925 are estimated at 710,000, and deaths at 288,000, leaving a natural increase of 422,000 which reduced the loss due to cityward movement to 479,000.

All geographic divisions of the country showed net decreases in farm population during the year, the Mountain division showing a decrease of 3.9 per cent and the Pacific division 1.6 per cent.

Irrigation Notes from New South Wales, Australia

Irrigation officials in the land "down under" are coping with much the same problems as the United States is attempting to solve on the irrigation projects of the West—Aided and directed settlement holds a prominent place



Burrinjuck dam, Murrumbidgee Irrigation Area, New South Wales, Australia. General view of dam and spillways during the flood of May, 1925

THE Annual Report of the Water Conservation and Irrigation Commission of the State of New South Wales, Australia, for 1925, has many things of interest to lawmakers, managers of irrigation works, and those seeking to make homes on irrigated farms. It shows that the conditions which affect reclamation in this country are operating in much the same fashion in Australia, where the conditions are very similar to those of the Pacific Coast States. A few extracts from this report, which have a direct relation to our own problems, are worth a place in this issue of the ERA.

The Murrumbidgee project, the largest single reclamation project in New South Wales, is on the Murrumbidgee River. Its flow is regulated by a dam placed in the channel of the stream, which creates a reservoir which backs the water up 45 miles and impounds about 1,000,000 acre-feet. The dam is of concrete masonry, arched in form, and about 250 feet in height. The design aimed to provide a spillway large enough to carry the highest floods, but on May 27, 1925, all previous records and all previous computations were set at naught by heavy rains on the headwaters of the river, which brought down to this reservoir a discharge estimated at more than 340,000 cubic feet per second. The maximum discharge of the Colorado River at Yuma is only 240,000 cubic feet per second, and this discharge caught the Murrumbidgee Dam with the reservoir full. The result was that over 150,000 cubic feet a second passed down the spillways, which were inadequate, and the water rose till it topped the dam to a depth of 3.33 feet above the parapet walls. The accompanying illustration shows the appearance of the flood at about its greatest discharge over the dam. The structure stood the test. No material damage was done.

The Murrumbidgee project has a total area of about 250,000 acres, larger than any single enterprise in this country except the Imperial Valley. It is in the heart of a great pastoral district with a very limited local market for its products, the chief market being Sydney, about 200 miles distant, and which has a population of a million people.

HELPING THE SETTLERS

To secure settlers for this area the state has, from the first, pursued a policy of helping to prepare the land for cultivation and of making certain advances to help settlers of small capital build their houses and do whatever was needed to make the farm self-supporting. An act of 1920 provided an appropriation of $4,200,000 to help improve farms for returned soldiers. An act passed in 1923 provided another appropriation of over $2,000,000 and in another in 1924, $1,562,000, or a total since 1920 of $7,787,000. The total balance sheet of the Murrumbidgee project shows that advances to settlers to help them improve and equip their farms have amounted to more than $10,700,000.

The law under which these advances are made does not require any capital of soldiers, but does require the civilian settlers to have not less than $1,500 capital of his own, and the results have been much more satisfactory with the civilian than with the soldier settler. The hard times that have rendered adjustments necessary in the United States have operated in much the same way in Australia. It has been found necessary to extend the term of repayment of advances to help improve and equip farms from 20 years, which was the fixed maximum of the original act, to from 20 to 40 years, according to the classification of the land, the plantings, and the class of farm in question.

This extension of time in Australia does not involve any loss to the Government as interest is required. This interest has been reduced so that the maximum charge is 5½ per cent. Before that it was whatever the commercial rate might be. A provision has been incorporated in the law just amended, which corresponds to a provision included in the bill now before Congress for adjustment of settlers' debts on Federal reclamation projects, that is, it provides for a postponement of installments of principal and interest for a period not to exceed five years, which is the same provision as is found in the omnibus adjustment bill in the United States. The Australian act provides for transfers from farms found unsuitable for irrigated culture, to lands that are suitable. That provision has been recently incorporated in the Federal reclamation act.

(Continued on page 87)

Irrigation Notes From New South Wales

(Continued from page 86)

INABILITY TO GET SETTLERS

In 1923 a contract was entered into between England and Australia which provided for advances to settlers on irrigated farms, ranging from $3,000 to $10,000. These advances were to be made on very liberal terms and at low rates of interest. The purpose was to attract settlers from Great Britain to the farm lands of the different Australian States. As the Murrumbidgee area is a region in which the climate permits all of the crops which can be grown in southern California, it was thought that there would be a rapid movement of people there, but the last annual report of this commission shows that although the fullest information has been made available, the response has been very meager, not only from settlers from England but from home seekers in Australia. During the last year there was a slight falling off in the total number of settlers on this project, due as the report states, to the number of discharged soldiers who have given up their holdings.

COOPERATIVE BUSINESS ENTERPRISES

In addition to the advances made to help settlers improve and equip their farms, it was found necessary to do something to help create markets for the surplus products of settlers which would not stand shipment to Sydney or other distant points, and one of the efforts made in this way was the building by the Government of a cooperative fruit cannery at one of the principal centers of the project. This was operated for a number of years at a loss, but for 1925 there was a profit of $925, after allowing $86,000 for interest and $45,000 for depreciation.

Commissioner Mead visited Australia in 1923 to act as an adviser in the development of this project, and among other things recommended some cooperative arrangement for the sales, in advance, of the alfalfa crops, the idea being that the great pastoral interests of the country would find it to their advantage to contract for the alfalfa hay needed to carry them through periods of drought, and through such advance contracts, such as are made in the United States in the purchase of sugar beets, the growing of alfalfa would be stabilized, the settlers would be able to equip their farms with the necessary machinery to harvest it effectively, and prices from year to year would be stabilized. The report of the commission notes that the proposed demonstration is to be carried out.

Aided Settlement in Esthonia

IN a recent issue of the International Labor Review, the subject of the social aspects of land reform in Esthonia is discussed by M. Martna, member of the State assembly. The following interesting comments on aided and directed settlement are taken from this article:

"In influential circles the view is held that the basis of the material prosperity of the country is agriculture, and especially small farming. Hence the effort to set the settlers firmly on their feet and at the same time to help the peasants on the old farms.

"The first necessity is that the land should be transferred to the settlers on the most favorable terms possible. They can lease their holdings, or buy the freehold at a reasonable price. Specially distinguished soldiers, disabled soldiers who have lost more than 40 per cent of their working capacity, and the survivors of deceased soldiers get the land rent free for their lifetime. The rent, or interest on the purchase price, is fixed at a reasonable rate. The settlers have also the privilege of obtaining expropriated implements or stock at special prices. They have been granted loans for the purchase of stock and equipment to a total of about $672,000, and building loans to upwards of $1,480,000, the rate of interest being 6 and 2 per cent, respectively. Loans for the purchase of stock and equipment have to be repaid in six years; building loans are repaid by 29 yearly payments of 3 per cent for wooden buildings and by 40 yearly payments of 2 per cent for stone buildings, in addition to the interest."

The state has also made loans for building cooperative dairies, amounting to $295,700. In addition the state has guaranteed credits for marketing agricultural produce of $322,580 in Sweden and $26,880 in Finland.

STARTING THE SETTLER RIGHT

The public but unofficial organizations with which the Ministry of Agriculture collaborates are the Central Union of Farmers and the Settlers' Association. The program of the Farmers' Union extends to every branch of practical agriculture, including the use of machinery, accountancy, and cooperation. The union has a permanent staff of 86 and gives practical advice to farms and cooperative societies and in public meetings. The Settlers' Association has similar aims, principally among the new peasants. The association does not attach much importance to courses and lectures, but expects more from individual instruction and from organizing single farms. The association tries to find suitable settlers who declare their readiness to work their farms in strict accordance with the instructions given by association instructors. These farms are intended to serve as model farms and as educational examples. The work of the cultivation experts is to prepare plans for improvement schemes, drainage, laying out of farms, to determine suitable rotation of crops, etc. Both organizations are subsidized by the state.

Sun River Project Dam Named for Former Senator

A tribute to the memory of former Senator Paris Gibson, of Montana, will be paid to him by designating as "Gibson dam" the proposed storage dam on the Sun River irrigation project in Montana.

Former Senator Gibson, who died at an advanced age a few years ago, represented one of the best types of the western pioneer. He was born on July 1, 1830, graduated from Bowdoin College in 1851, and in 1858 built the first flour mill and the first woolen mill in Minneapolis. In 1879 he settled at Fort Benton, and in 1882 founded the city of Great Falls, Mont. He was active in the State Constitutional Convention, was a member of the Montana Senate in 1891, and United States Senator from 1901 to 1905.

The tentative plans for the new dam, which will bear the Senator's name, call for a masonry structure more than 200 feet in height, with a crest length of 820 feet, and a volume of 195,000 cubic yards. The area of the reservoir behind the dam will amount to 1,360 acres, with a capacity of 105,000 acre-feet.

The question of naming the dam after Senator Gibson was brought to the attention of the Governor of Montana and the Senators and Representatives from that State, with the result that they were unanimous in approving the suggestion.

The Needs of the South

Extract from an interesting letter from David R. Coker, farmer and plant breeder of Hartsville, S. C.

THE State of South Carolina in the recent session of its legislature passed a bill appropriating $25,000 to advertise the State. The literal meaning of "advertise" is to "turn toward." How can this best be accomplished for agriculture? By demonstrating to our own people and to possible settlers that this is a favorable section for happy and prosperous home life on the farm. This can be definitely proven only by showing the present and prospective farmer actual demonstrations of profitable and happy agricultural conditions.

We must have an intensive agriculture which will afford something more than a living wage, and arrangements must be made by which expert farmers who know certain types of intensive agriculture can come here into good social surroundings and receive the competent instruction necessary for their adaptation to our climate and soil and to correct methods of culture and fertilization under southern conditions. They must be able to purchase good land at reasonable prices and on long time, and they must be settled in communities where they can learn from each other and from our locally trained farmers and can cooperate together in the sale of their perishable and semiperishable products.

The type of agricultural settlement I have in mind is illustrated by the Durham settlement in California, the settlements of Mr. Faast and Mr. Edmonson in northern Wisconsin, and those colonies developed by Mr. Hugh MacRae near Wilmington, N. C. Into these settlements have come people of widely varying education and knowledge of agricultural subjects. They have been enabled to buy land on long time at reasonable rates of interest; they have received information, counsel, and in some cases financial help from the organizations or individuals directing these settlements; and they have all been able to learn from each other and cooperate together in an effective manner, which would be impossible under more isolated conditions. Dairying, chicken farming, and fruit and vegetable growing lend themselves particularly to this type of settlement, but the production of the finest grades of cotton, tobacco, and feed crops would fit in with an intensive agriculture for a proportion of the acreage in rotation with other crops.

Uncompahgre Plans Cooperative Marketing

THIRTY-FIVE or more earnest men, all interested in the problems of cooperative marketing, attended a recent meeting at Montrose, Colo., on the Uncompahgre project.

H. A. Ireland, county agent for Montrose County, stated that the meeting had been called in response to a generally expressed desire that some kind of organization be effected having as its aim the establishment of an orderly system of marketing in keeping with the spirit of the times, and one which would win and hold the support of the interested farmers, in whose behalf the movement was being initiated.

The meeting was also addressed by Andrew Weiss, assistant director of reclamation economics, and Dr. B. O. Aylesworth, State director of markets, who suggested the organization of a county advisory council to be composed of two members from each of the principal agricultural enterprises. The function of such an advisory council would be to supervise new organization processes, to determine the readiness and advisability to organize and to affiliate with related cooperatives, to assist in the organizaiton of women's clubs, boys' clubs, and girls' clubs, to assist in the adjustment of disputes arising within or between locals and between shippers and carriers, and in general to foster the cooperative movement in every legitimate way and to fight the encroachments of hostile forces.

Following Doctor Aylesworth's remarks a temporary advisory council was formed, representing the bee keepers, hay growers, poultry, fruit, potatoes, beets, onions, dairy products, grain, swine growers beef, cattle, and sheep. A temporary executive committee was elected, composed of T. C. Anderson, T. W. Monell, and Harry Monell. Plans were made for the formation of a permanent advisory council in the near future.

Concrete-lined lateral on the Yuma project, showing a steel water-right gate and safety overflow wasteway

Law Notes of Interest to the Irrigationist

Prepared by the District Counsel and others

MANDAMUS TO COMPEL ASSESSMENTS OF TAXES BY IRRIGATION DISTRICTS

SECTION 7326, Oregon Laws, provides that irrigation district bonds and the interest thereon and all payments due or to become due to the United States under any contract between the district and the United States * * * and all obligations for the payment of money authorized and incurred under the act shall be paid by revenue from annual assessments upon the land in the district. Section 7328 provides that the board of directors of the district shall, on or before the first Tuesday in September each year make a computation of the whole amount of money necessary to be raised by the district for the ensuing year for any and all purposes whatsoever in carrying out the provisions of the act, including estimated delinquencies on assessments. Section 7331 provides that in case of neglect or refusal of the board of directors to make the assessment and levy, then such assessment and levy shall be made and equalized by the county court.

In the case of Kollock *v.* Barnard et al (242 Pac. 847), action was brought in the Supreme Court of Oregon by the holder of a bond of the district, on behalf of himself and others similarly situated, to compel assessments to meet interest due on the bonds during 1926 and the principal of such bonds as matured in 1926. It was admitted that the board of directors and the county court had failed to make sufficient levy to cover the interest and principal of such bonds. The court held that the holders of the bonds were without other adequate legal remedy, and that mandamus would lie to compel the levy of a tax required by a mandatory statute. Mandamus issued.—*R. J. C.*

Payment of adjusted compensation and furnishing quarters, etc., to employees

[(Extracts from) An Act Making appropriations for the Treasury and Post Office Departments for the fiscal year ending June 30, 1927, and for other purposes. (Approved March 2, 1926, 44 Stat. ——).]

* * * *

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, * * *

SEC. 2. Those civilian positions in the field services under the several executive departments and independent establishments, the compensation of which was fixed or limited by law but adjusted for the fiscal year 1925 under the authority and appropriations contained in the Act entitled "An Act making additional appropriations for the fiscal year ending June 30, 1925, to enable the heads of the several executive departments and independent establishments to adjust the rates of compensation of civilian employees in certain of the field services," approved December 6, 1924, may be paid under the applicable appropriations for the fiscal year 1927 at rates not in excess of those permitted for them under the provisions of such Act of December 6, 1924.

SEC. 3. The head of an executive department or independent establishment, where, in his judgment, conditions of employment require it, may continue to furnish civilians employed in the field service with quarters, heat, light, household equipment, subsistence, and laundry service; and appropriations for the fiscal year 1927 of the character heretofore used for such purposes are hereby made available therefor: *Provided,* That the reasonable value of such allowances shall be determined and considered as part of the compensation in fixing the salary rate of such civilians.

Approved, March 2, 1926.

Holstein dairy herd on the Shoshone project, Wyoming

The Tieton Project's Future

Extracts from address by H. M. Gilbert, President Tieton Water Users' Association

THE Tieton project, Washington, is primarily and almost unanimously an orchard project. The future value of all our lands will virtually be what they are worth to produce fruit. The unequaled keeping quality, the fine texture, the large production of higher grades, the comparative freedom from pests, all unite to insure that the Tieton project shall be the leading fruit project of the Northwest. In all my 25 years' experience growing fruit I have never seen so promising a future as the next 10 years promise to be, and in this light I hate to see hundreds of our water users losing or giving up their lands.

Let me give you the logic of the situation as I see it. Nearly all other fruit projects of the Northwest have reached or passed their maximum production. With our fruit markets, home and foreign, rapidly increasing and expanding; with our storage facilities creating new demands and new markets for our pears and apples, almost the year round, our fruit demand seems certain to increase. Most of our Northwest orchards running from 12 to 18 years of age are passing or have passed their maximum of high quality production. The Tieton presents practically the only large area of high-class growing orchards and unplanted high-class orchard lands in the Northwest. But for our inadequate water supply, all our orchard lands would be easily worth from $1,000 to $1,500 per acre. Why, then, should we hesitate to pay $30 per acre additional for a sufficient water supply, especially if such additional cost is spread over 20 years or placed at the end of our present payments?

RECLAMATION CONQUERS DESERT

Considerable criticism has been made of reclamation. Much of this criticism is unjust, narrow, and whimsical. Reclamation, taking the wasting torrents, destructive floods, and drifting snows of winter, storing them in lakes and reservoirs, and, the following summer, building homes, productive farms, and orchard, with them, will ever challenge the enthusiasm of men, be they easterners or westerners. Reclamation, with all our bungling, has conquered much of the Great American Desert. Reclaimed desert in the Yakima Valley alone this single past year has produced 20,000 carloads of perishable freight for railroad freight earnings and for the markets of the world. With the return from the 20,000 carloads we will buy many thousand carloads of materials and supplies to build better homes and better cities and more productive farms to increase our freight-earning tonnage next year. Reclamation in the Yakima Valley alone makes an annual market for thousands of automobiles, trucks, tractors, machinery, fabrics, books, magazines, life insurance and a thousand other products of the East.

Big Money Crops Put Yakima in Good Shape

A recent editorial in the Yakima Daily Republic states that nearly 2,000 cars of Yakima products went out of the valley during March to various markets. Most of the shipments were of apples. Nearly all the rest were potatoes. "These 2,000 cars will bring back a lot of money. Last year's production in the valley probably broke all records, and it has been sold out at good prices. By the time we have cleaned up it will be found that our farmers are in unexpectedly good shape."

The East is greater, America is greater, because of the West, the reclaimed West! No one doubts the wisdom of the homestead act. Many of you have seen the winning of the West by the homesteader. It was a great victory for the West, a greater victory for the East, and a still greater victory for America! But now there is no new West except as reclamation creates it. If the narrow enemies of reclamation, or narrower friends of reclamation, persist in destroying reclamatoin it will mean crippling America, stagnation in the West, and no expanding markets for the East. Without reclamation our young men must find a new West under a foreign flag, in South America or Canada.

TIETON WILL REPAY EVERY DOLLAR

Destroy reclamation and you destroy expansion. The East has thrived on the growth of the West. The West finds its markets in the East; they are not antagonists. They are comrades in the great adventure of building a greater America.

America needs more reclamation, not less. Reclamation supplements our national wealth. It insures a food supply in years of drouth. It insures abundance of fruits for the Nation's health. Reclamation is a way of enlarging America making new land for new homes from the output of volcanoes.

I have full confidence, with reasonable consideration by Secretary Work and extension of payments for those water users who were caught in the great agricultural depression after the war, that the Tieton project will repay every dollar expended by the Government in its construction and that the Tieton project will be the best argument in the Northwest for the wisdom of national reclamation.

Big Yakima Valley Crops Bring Money to Growers

Up to April 2 a total of 26,482 cars of produce had been rolled from the Yakima Valley for the 1925–26 season, or slightly more than the amount which had been moved by April 1 of the big 1923 season, according to the Yakima Valley Traffic and Credit Association.

Up to the beginning of the month 12,687 cars of apples had been shipped, leaving about 2,570 cars in storage. There were, however, still three months for the apple holders to sell their produce, and if sales continue at the rate of the past few weeks, the entire crop should be cleaned out by June 1.

Additional shipments this season have been made up largely of potatoes and pears. Already 6,359 cars of potatoes have left the valley and there are still some 700 or 800 cars to go at prices which will put many a grower on easy street.

The shipment record of a recent week reads as follows: 335 cars of potatoes, 306 cars of apples, 16 of pears, 4 of onions, and 2 cars of vegetables, a total of 663 cars of products.

Without question, 1925 was a very prosperous year in the Yakima Valley.

Orland Drought Broken After 44-Day Dry Spell

The drought on the Orland project, California, which had extended over a period of 44 days, was broken on April 4 by heavy rain. Up to noon of the following day the precipitation amounted to 1.97 inches. Project water supply conditions were materially improved, and irrigation was suspended immediately and the canal head gates closed.

Plan to Increase Water Supply

ALTHOUGH most of the irrigation projects of the Bureau of Reclamation enjoy an adequate water supply, there are a few projects which suffer from occasional or recurrent water shortages. The causes of these shortages and particularly any possible remedies that may be available are naturally of vital interest to every water user on any project subject to such difficulties.

Occasional shortages due to extreme variations from the annual mean run-off are to be anticipated in intensively developed irrigated districts. However extensive the period covered by stream flow records on any stream, there is always the likelihood that greater extremes both of flood and of drought may be experienced in the future than are included in the records and in fact the most efficient utilization of the water resources of a stream basin may involve such extensions of the irrigated area as to incur the certainty of limited shortages in case of the recurrence of years of run-off as low as the lowest years already recorded. Such shortages frequently in effect are blessings in disguise, encouraging efforts at improvement of water duty and averting the serious consequences which always, soon or late, accompany the unrestrained application of large quantities of irrigation water to the land.

The few instances of recurrent shortages on our projects may be due either to an original overestimate of the run-off available to meet project needs, to the loss of available storage due to silting, leakage or other impairment of reservoir capacity, or to higher peak demands than that for which the main canal or distribution system was designed. On these projects the situation is usually complicated by the fact that some land is of such poor character that it will not pay to be developed.

Such projects present two problems for solution:

(*a*) An increase in the water supply for at least a part of the good land.

(*b*) Exclusion of poor land now included in the irrigable area.

An inadequate water supply might be relieved by providing additional storage; by enlarging canals; by improving the lateral and sublateral systems to lessen seepage losses, improve delivery control, and lessen possibilities of interruption of service; by lining laterals to save seepage losses and prevent interruption of service; and by a reduction of the irrigable acreage by eliminating the lands that can not be farmed profitably.

Where the cost of these measures is not excessive, and the returns from the land under ditch are so uniformly attractive that this additional cost is not burdensome, it is comparatively a simple matter to remedy both situations. When, on the other hand, there is absolutely no more water to be had or when to provide the additional supply would involve burdensome or prohibitive expense, some other means of relief must be sought.

Suggested solutions for the two problems in the latter case are—

1. Permit the transfer of water from poor land to good land by any water users to the extent of 25 per cent of the area of his good land.

2. Permanently transfer the water from the area from which it is taken to the new area by a formal contract. For example, a landowner with 20 acres would be allowed to purchase and permanently transfer water for 5 acres of land located on any other part of the project to the 20-acre tract. The water user would then pay the regular charge per acre for 25 acres in order to obtain water for his land, in place of only 20 acres.

3. All land from which water is transferred would be permanently excluded from the irrigable area of the project.

Such a plan would accomplish the following results:

1. Give owners of land in cultivation an opportunity to secure immediate relief from water shortage.

2. Eliminate poor land.

3. Save the necessity for an immediate investment in new construction or betterment work.

4. Allow the water users who think they have a sufficient supply of water to proceed as they are without increasing their construction costs.

Under the present policy of requiring all lands to make payment, the poor land would either have to pay up or sell out. Thus the area than can not be farmed profitably would be forced on the market and the water from it would be made available for the better lands than can pay the construction charges. Also there would be no necessity for charging off any construction charge, and the lands getting the water would pay for it in the same manner as they would pay for an increased water supply from any other source.

Farmers' Cooperative Business Associations

Ten thousand eight hundred and three farmers' business organizations of all kinds, types, and sizes were listed with the Department of Agriculture at the close of 1925. This number lacks but 45 of being double the number listed in 1915 when the first nation-wide survey of cooperative associations was made.

The total number of active associations, including those which have reported to the Department of Agriculture and those which have not, is estimated at 12,000. These figures are for business associations, those selling farm products, buying farm supplies, operating creameries, cheese factories, canning plants, grain elevators, stockyards, warehouses, or rendering some one or more of the essential services connected with the conduct of the farmers' enterprises. The figures do not include farmers' cooperative banks, credit associations, nor insurance companies.

Salt River Project Water Supply Increased

The Salt River project, Arizona, has recently completed its additional pumping project and has added to the water supply a total of 480 second-feet, giving them an available pumped water supply of more than 300,000 acre-feet for irrigation. This will give the project an equal water supply with that of last season, even with a continuation of the same drought conditions as prevailed last year. This year the stored water supply is 175,000 acre-feet behind that of last year. However, the project carried over 110,000 acre-feet from last year, so that there is an actual shortage in the stored water supply of only 65,000 acre-feet. The additional pumped water supply will more than make up this difference.

April will see the completion of the Mormon Flat plant, which will add 25,000,000 kilowatt-hours to the power system in dry years. The Horse Mesa project is more than half completed and should be in operation by next February. These developments will insure the project's water supply against serious drought, with water assessments not to exceed this year's cost to the farmer, even though the drought continues for several years.

In general the project is better farmed than at any time in its history; and the farmers are assured of a minimum of 2.6 acre-feet delivered to each acre in the project, in addition to the normal flow for the older lands of approximately 150,000 acre-feet.

Organization Activities and Project Visitors

SECRETARY Work and Doctor Mead left Washington on April 17 for the Southwest. They will visit the lower Rio Grande Valley for a personal study of conditions affecting the development of the Rio Grande, later visiting the Rio Grande and Yuma projects and making a trip down the Colorado River to the Boulder and Black Canyon dam sites. They expect to return to Washington May 3.

R. F. Walter, chief engineer, and E. B. Debler, engineer in the Denver office, were in Washington recently for a conference to fix definitely the conditions for the development of Spanish Springs.

William S. Arthur, former superintendent of the Williston project, has been granted leave without pay for six months from April 7 to October 6, 1926.

Max H. Knight, junior engineer in the designing section of the Denver office, resigned effective March 27.

Mrs. Clara G. Hood, née Clara G. Parse, clerk in the Denver office, resigned effective March 31, following her recent marriage.

Jacob R. Ummel, former chief clerk of the Denver office, has been appointed office manager of the Seattle office of the Bureau of Education and The Alaska Railroad. L. R. Smith has been designated acting chief clerk of the Denver office.

John F. Richardson, superintendent of the Newlands project, has resigned to accept a position in Mexico with the J. G. White Engineering Corporation. D. S. Stuver has been designated acting superintendent.

Mrs. Jennie T. Davis, auditor in the Washington office, retired from the bureau on April 29, after 44 years of continuous service with the Government, 36 of which were with the Interior Department. Mrs. Davis was entertained at luncheon by the other women of the Washington office and presented with a mahogany table.

The Lower Yellowstone project has been represented in Washington recently by a delegation consisting of H. A. Parker, superintendent; O. M. Oppegaard, Savage, Mont.; Augustus Vaux, Sidney; A. H. Phillips, Fairview; and C. S. Milhiser, superintendent of the Sidney plant of the Holly Sugar Corporation.

Charles T. Pease died in Denver, Colo., on March 20, 1926, of pneumonia. Mr. Pease was born in Bridgton, Me., on May 3, 1858. He graduated from the State University of Maine and from the Denver University Law School. He has been connected with the Bureau of Reclamation since December 14, 1903, in various engineering capacities, including project management and investigation of proposed irrigation, flood control, and power developments in the West.

The delegation in Washington from the Shoshone project in connection with project adjustments consisted of L. H. Mitchell, superintendent; G. W. Atkins; and S. A. Nelson. While here, Mr. Nelson ordered a number of colored enlarged photographs of scenes on the project to hang in his bank.

Frank P. Trott, State water commissioner of Arizona, and H. S. McClusky, secretary to the Governor of Arizona, conferred on March 26 with the board of governors of the Yuma County Water Users' Association and Superintendent Preston regarding the leasing of a power site at Laguna Dam and the development of power.

The Attorney General has assigned W. C. Matthews, a special assistant, to have direct charge of the Stony Creek water right adjudication litigation, Orland project, for the Department of Justice under the general supervision of Ethelbert Ward, special assistant. Several days were spent by these officials in San Francisco in consultation with Oliver P. Morton, attorney for the Orland Unit Water Users' Association, regarding the immediate work to be undertaken in the case.

Assistant Engineer E. R. Romberg, Grand Valley project, has made application for a furlough for one year to accept a position as city engineer for Grand Junction. Mr. Romberg has previously worked for the city and has been offered a very satisfactory position in charge of a large paving and sewer construction program.

W. G. Steward, who has been on the Boise project for about 11 years in charge of hydrographic work, has resigned to work for the Twin Falls South Side Canal Co.

L. N. McClellan and C. M. Day, engineers in the Denver office, visited the Boise project recently to make the final inspection of the Black Canyon Dam power plant and to test the different units.

E. B. Debler, engineer in the Denver office, spent a short time on the Boise project gathering data for a special report on the project extensions.

Barry Dibble, former superintendent of the Minidoka project and now consulting engineer of Redlands, Calif., was on the project during March preparing a report on power credits for the Minidoka irrigation district.

B. H. Critchfield, agricultural economist, and G L. Sulerud, assistant agricultural economist, visited the Burley office of the Minidoka project recently in connection with the economic survey of Idaho agriculture now in progress.

Hiram Shippy has been employed as gatekeeper at Orman; Verne Braeewell as foreman at Vale; and J. L. Barker as ditch-cleaner operator at Orman, Belle Fourche project.

District Counsel E. E. Roddis and W. J. Burke spent a few days on the Belle Fourche project to consider pending legal work. Conferenee was also had with the secretary of the irrigation district relative to the legal difficulties encountered under the proposed supplemental contract.

Andrew Weiss, assistant director of Reclamation Eeonomics, and William M. Green, engineer, visited the Strawberry Valley project during Mareh to make an inspection of lands in the vicinity of Utah Lake.

Arthur Ruettgers, assistant engineer on the Riverton project, has been transferred to the Kittitas division of the Yakima project.

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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; P. W. Dent, Assistant to the Commissioner; C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant; H. A. Brown, Chief of Division of Settlement and Economic Operations; C. N. McCulloch, Chief Clerk

George C. Kreutzer, Director of Reclamation Economics

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, Acting Chief Clerk; Harry Caden, Fiscal Agent; Andrew Weiss, Assistant Director of Reclamation Economics; B. E. Hayden, Industrial 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	J. B. Bond				
Carlsbad	Carlsbad, N. Mex.	L. E. Foster	W. C. Berger	W. C. Berger	Ottamar Hamele	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.	A. R. McGinness	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.	G. E. Stratton	E. E. Chahot	E. E. Chahot	do	Do.
Minidoka	Burley, Idaho	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Boise, Idaho.
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	T. R. Pael	Wm. J. Burke	Mitchell, Nebr.
Okanogan	Okanogan, Wash.	Calvin Casteel	W. D. Funk	N. D. Thorp	H. L. Holgate	Portland, Oreg.
Orland	Orland, Calif.	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Rio Grande	El Paso, Tex.	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	El Paso, Tex.
Riverton	Riverton, Wyo.	H. D. Comstock	R. B. Smith	V. E. Huhbell	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	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont.	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg.	H. M. Schilling	C. M. Voyen	C. M. Voyen	H. L. Holgate	Portland, Oreg.
Uncompahgre	Montrose, Colo.	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Yakima	Yakima, Wash.	J. L. Lytel	R. K. Cunningham	J. C. Gawler	H. L. Holgate	Portland, Oreg.
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 [5]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Boise, Idaho.
North Platte, Guernsey Dam.	Guernsey, Wyo.	F. F. Smith [5]	Chas. Klingman	T. R. Pael	Wm. J. Burke	Mitchell, Nebr.
Umatilla, McKay Dam.	McKay Dam, Oreg.	R. M. Conner [6]	C. B. Funk	W. S. Gillogly	H. L. Holgate	Portland, Oreg.
Kittitas	Ellensburg, Wash.	Ralph Lowry [5] Walker R. Young [6]	E. R. Mills		H. L. Holgate	Portland, Oreg.

[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

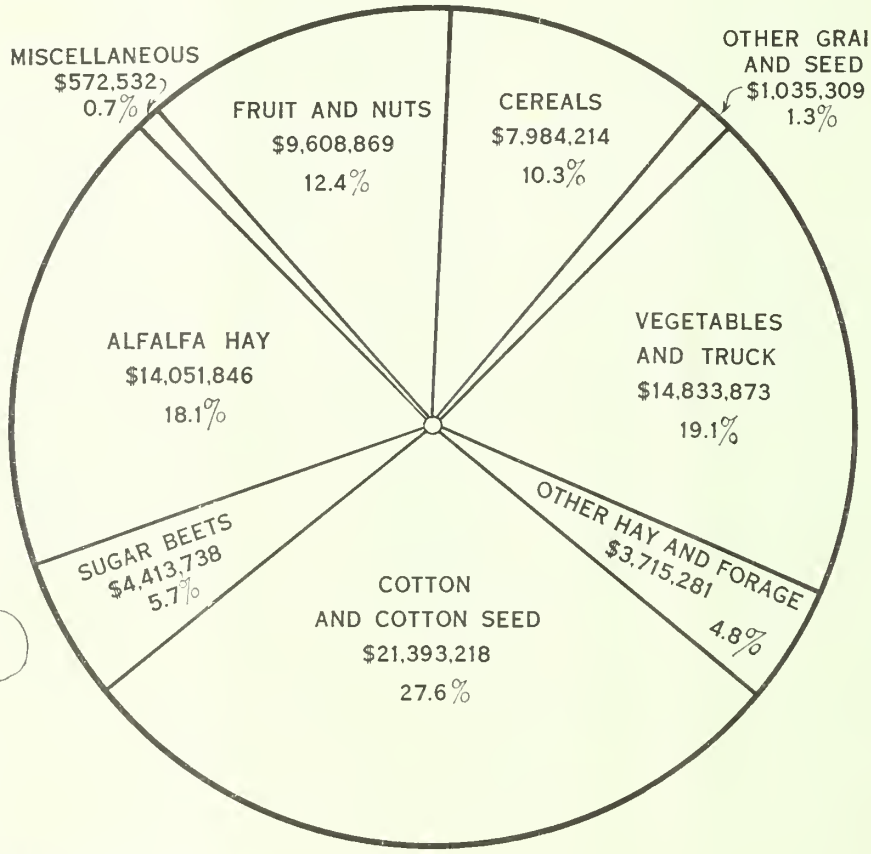
Project	Office	In charge of—	Cooperative agency
Sacramento Valley	Ellensburg, Wash.	Walker R. Young	Sacramento Valley Development Association and State of California.
Huerfano	Denver, Colo.	E. B. Dehler	
Dubois	American Falls, Idaho	F. A. Banks	Dubois Project Finance Association.
Milk River eastern tributaries	Hermiston, Oreg.	E. R. Crocker	
Spanish Springs storage	Fernley, Nev.	A. W. Walker	
Harney Valley	Boise, Idaho	R. J. Newell	
Owyhee	do	do	
Vale	do	do	
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	State of Utah.
Methow-Okanogan	Okanogan, Wash.	Orrin C. Smith	Okanogan irrigation district.
North Platte (Casper) pumping	Guernsey, Wyo.	F. F. Smith	State of Wyoming.

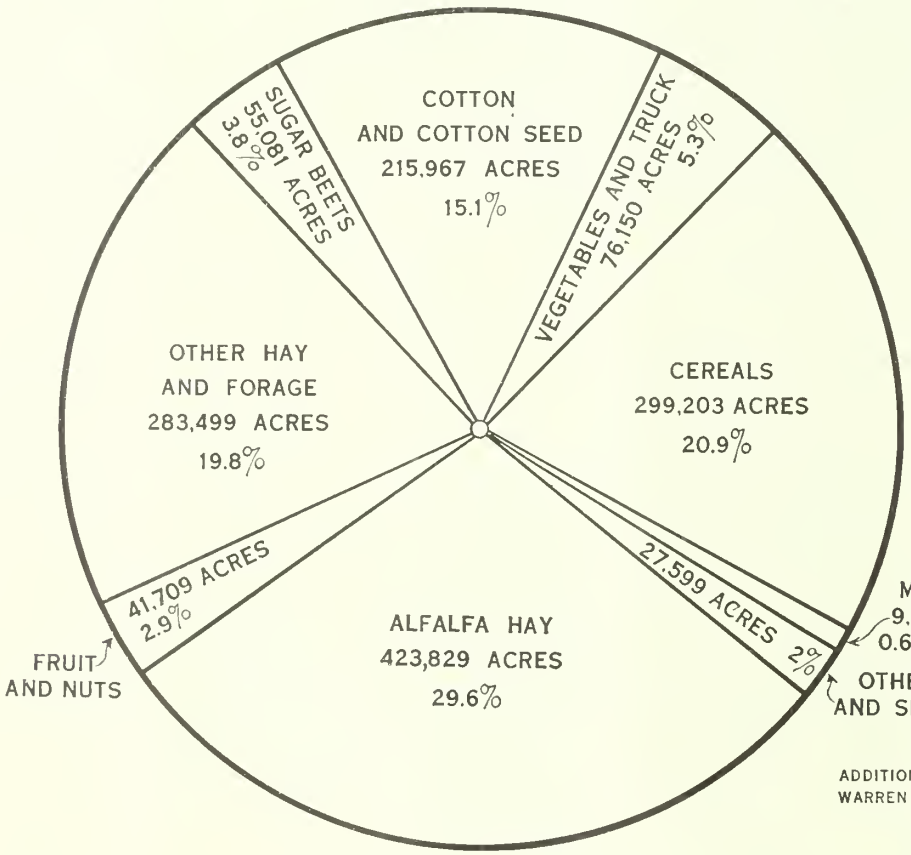
The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others the subscription price is 75 cents a year, payable in advance by check or money order drawn in favor of the Special Fiscal Agent, Bureau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

DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

VALUE AND ACREAGE OF IRRIGATED CROPS 1925





TOTAL VALUE
$77,608,880

TOTAL ACREAGE
1,432,155 ACRES

ADDITIONAL LAND RECEIVING PROJECT WATER UNDER WARREN ACT CONTRACT PRODUCED CROPS VALUED AT
$53,500,000

JHP

No 21620

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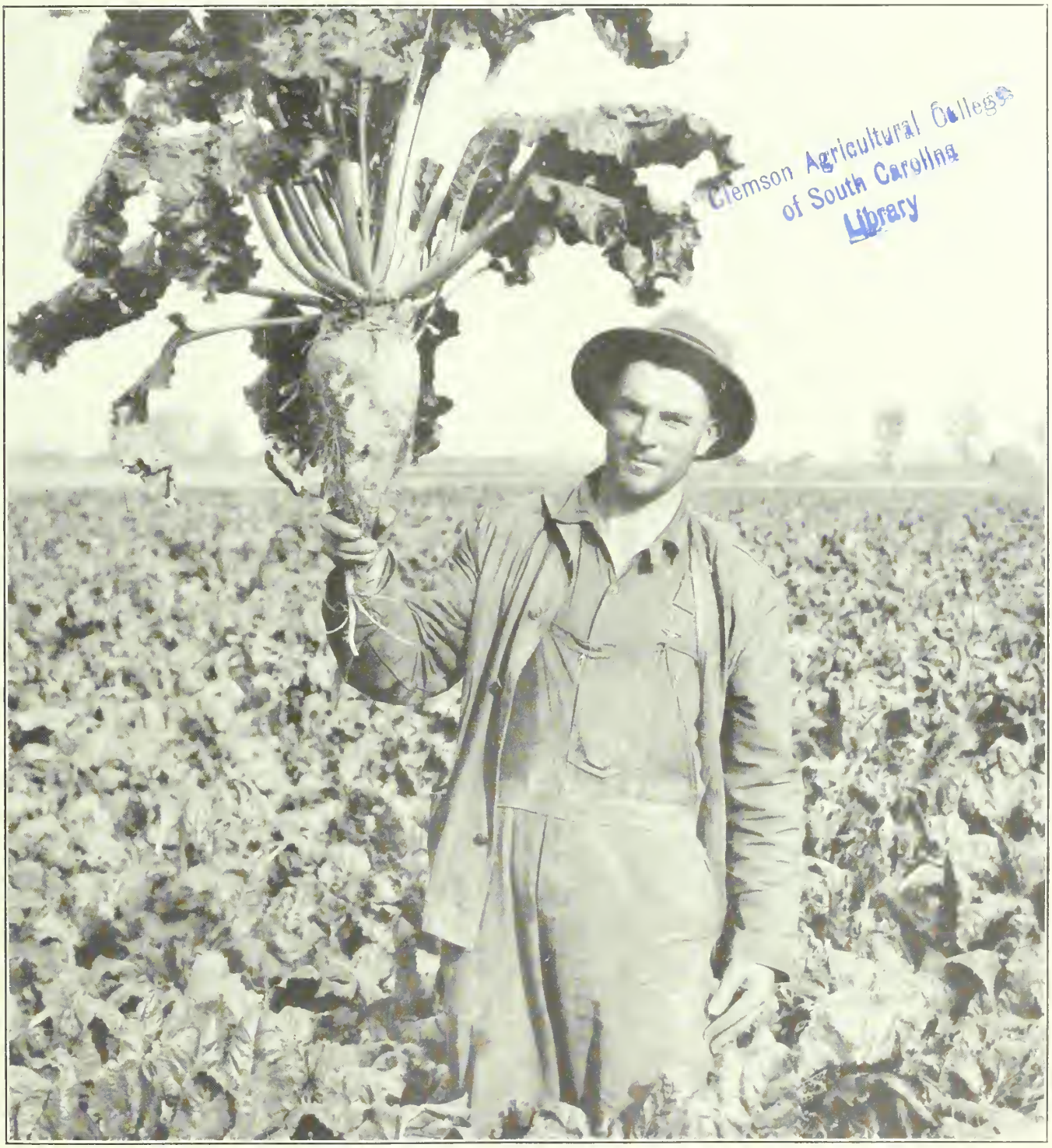
NEW RECLAMATION ERA

VOL. 17 JUNE, 1926 NO. 6



Clemson Agricultural College of South Carolina Library

SUGAR BEETS VALUED AT $4,413,000 WERE GROWN ON THE PROJECTS LAST YEAR

Clemson College Library Government Publications

GOVERNMENT OF THE UNITED STATES

EXECUTIVE BRANCH
THE PRESIDENT

LEGISLATIVE BRANCH
CONGRESS

SENATE
96 SENATORS

HOUSE OF REPRESENTATIVES
435 REPRESENTATIVES,
2 DELEGATES,
3 COMMISSIONERS

JUDICIAL BRANCH
SUPREME COURT

CIRCUIT COURTS OF APPEALS

UNITED STATES DISTRICT COURTS

VARIOUS SPECIAL COURTS
COURT OF CLAIMS
COURT OF CUSTOMS APPEALS
DIST. OF COL. COURTS
TERRITORIAL COURTS

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- CUSTOMS SERVICE
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- PROHIBITION UNIT
- SECTION OF STATISTICS
- GOVERNMENT ACTUARY

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- OFFICE OF INSPECTOR GENERAL
- OFFICE OF JUDGE ADVOCATE GENERAL
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- OFFICE OF CHIEF OF ENGINEERS
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OFFICE OF CHIEF OF AIR SERVICE

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  - DIVISION OF STAMPS
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- BUREAU OF ORDNANCE
- BUREAU OF CONSTRUCTION & REPAIR
- BUREAU OF ENGINEERING
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- GRAIN FUTURES ADMINISTRATION
- FIXED NITROGEN RESEARCH LABORATORY

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- CHILDREN'S BUREAU
- BUREAU OF NATURALIZATION
- DIVISION OF CONCILIATION
- WOMAN'S BUREAU
- U. S. EMPLOYMENT SERVICE
- BUREAU OF INDUSTRIAL HOUSING AND TRANPORTATION
- HOUSING CORPORATION

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- UNITED STATES SHIPPING BOARD
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- PAN AMERICAN SANITARY BUREAU

DISTRICT OF COLUMBIA GOVERNMENT

COMPILED BY W.I.SWANTON MARCH 1926 BUREAU OF RECLAMATION NO. 21616 A.M.S.

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. 17 JUNE, 1926 No. 6

Interesting High Lights on the Reclamation Projects

A NUMBER of potato growers on the Yakima project were reported to have been offered $100 a ton during April. H. C. Davis, of Granger, after selling part of his crop, was holding the balance which he valued at $30,000. The excellent prices received by the water users on this and other projects afford a partial explanation at least of the increase in collections of reclamation charges. The goal should be 100 per cent on every project.

DESIGNS and specifications for the construction of Gibson dam, Sun River project have been completed and forwarded to the Washington office for publication.

DURING April 420 carloads of agricultural products were shipped from the Yuma project, valued at $189,650. Since the beginning of the year the value of such products shipped has amounted to $1,283,850. Collections for the month on reclamation charges amounted to $14,297.01.

THE Arizona State Highway Department let a contract recently for the construction of the Telegraph Pass road between Yuma and Wellton, which will shorten the distance about 6 miles. The estimated cost of the work is about $250,000.

SHEEP men who wish to place lambs for feeding on Grand Valley project farms have submitted a plan under which the project farmers would be paid a certain guaranteed price per pound of gain and the owners would share equally in any loss by disease or accident which might occur during the feeding period. This movement is considered well worth encouragement, providing a valuable asset to the water users both from the standpoint of the money received and the increased fertility of their farms.

OF the 1,028 delinquent accounts on March 1 on the Uncompahgre project, 861 had been cleared on April 30 for the delivery of water for the irrigation season. It is estimated that between 90 and 95 per cent of the lands on the project which received water during the 1925 season are cleared for water for the present season.

THE market for potatoes on the Uncompahgre project held up well during the month, ranging from $3 to $4 per hundredweight, as a result of which only about 12 cars remained for future shipment at the end of the month.

TOTAL collection of reclamation charges by the Burley Irrigation District, Minidoka project, at the end of April amounted to $55,588.40. Payment had been made on more than 96 per cent of assessable land in the district. On the Gravity division, the Minidoka irrigation district withheld water from all individual water users more than a year in arrears, and at the end of the month all but about 200 water users had paid. As there were 141 idle farms out of 1,545 on this division in 1925 it is believed that comparatively few properties upon which water is desired are now delinquent.

AT American Falls Dam about 25,900 cubic yards of concrete were placed in the river section, three concrete mixers being used on the work. Excavation for the left abutment section and stripping for the left embankment were in progress.

SEEDING of certified potato stock was in progress on the Milk River project and contracts were being made for the sale of certified seed next fall at $2 per hundredweight f. o. b. cars at project points.

PLANS are being developed on the Lower Yellowstone project for obtaining listings and options on at least 8,000 acres of project land, the options to run to the United States and continue until December 31, 1928. Early indications are that a sufficient number of satisfactory listings will be obtained.

THE rabbit industry is growing steadily on the Newlands project, farmers finding that uniform demand and good prices make this a profitable side line. One water user derives his whole income from 3,000 rabbits, killing on an average 200 a week, averaging more than 3 pounds each, and selling around 27 cents a pound.

AT McKay Dam, Umatilla project, concrete work on the spillway gate structure was completed during the month Work was continued on placing the concrete paving on the upstream face of the dam. During the month 2,516 cubic yards of concrete paving, averaging 10½ inches in thickness, were placed, at a unit cost of $18.80.

A COW-TESTING circle is being organized in the vicinity of Palmyra, Strawberry Valley project, composed of 8 or 10 dairymen handling about 100 cows. The outlook appears promising for a further spread of this kind of cooperative movement. Poultry and poultry products are gaining in importance on the project, about 65 per cent of these products handled by the Utah State Poultry Association operating through locals distributed throughout the farming districts.

THE Okanogan project reports that a large crop of apples is in prospect if sufficient water is available. At the end of the month the apple orchards had all come into blossom and been given calyx spray.

99344—26

Time Has Come To Build Colorado River Dam, Says Secretary Work

The Colorado River Dam, with its unrivaled power possibilities, promising protection against floods, domestic water for great and growing cities, and an all-American canal for Americans, most constructive legislation before Congress

Black Canyon dam site on the Colorado River

UPON his return from a trip to the Pacific coast investigating the proposed lower Colorado River development, Secretary Work said in connection with it:

"The time has come to build the Colorado River Dam at Black Canyon. Our engineers have spent three full years, working every day, making borings to determine the security of its construction when completed. These borings have been pushed to a depth of 400 feet; the cores show solid granite, without fault or flaw. There is now no question about the foundations for this gigantic structure.

"The cleft in the mountains through which the Colorado River flows is 300 feet wide at the stream level and 700 feet wide, 600 feet above the river. The mountains extend for miles each way from this slit, at the same height, so that the wings of this dam are already constructed with masonry more stable than man could build. The saving in the building cost of these wings of this tremendous project are past estimate in dollars.

"Nature placed this canyon about where it ought to be for the proposed purposes. At Parker, Ariz., a short distance below, the application of water for irrigation will begin and this need continues to extend on both the Arizona and California sides all the way down to the international boundary, some 250 miles.

"When the pending bill is passed by Congress, the first step toward construction will necessarily be the diversion of the Colorado River out of its natural channel, by tunnels to be run through the mountains around the site of the dam. Nature has again contributed to this first step by providing a safe foundation for the cofferdam, which must be placed in the stream above, to divert the river through these improvised channels. It is estimated that more than one year will be required to construct the three necessary tunnels to divert the water from the site of the new structure. This will be expensive, but the money will not be lost, as the power plants will be constructed at the lower ends of these tunnels, which will have served their purpose when the works are completed, but which would otherwise have to be built independently to operate the power plants. I believe the necessity for this construction is imminent. There is untold wealth under the surface of the mountains and plains of these adjacent States, of which the precious metals constitute the smaller part. Man power must be supplemented by hydroelectric power to extract these hidden resources in addition to an estimated agricultural production of one hundred million dollars.

"This entire project has been thought out on the theory that, unlike money appropriated for rivers and harbors, it will be returned in time to the Government and the amortized plant will then belong to the Government as property

At the Black Canyon dam site, Colorado River. Left to right: E. E. Colvin, vice president Southern Pacific Railroad; Secretary Work; Commissioner Mead; Governor Scrugham, of Nevada

to be disposed of as conditions at that time may suggest.

"The Bureau of Reclamation has, over a period of many years, prepared engineering plans, which we believe well conceived and safely founded, to use in this construction. The Bureau of Reclamation as now organized is equipped to prosecute this development. Commissioner Mead has 25 years' acquaintance with the river and the topography of its basin and the necessary technical knowledge, experience, and judgment—a background that no other man has for this work.

"There is more money available in this country than there are men to use it profitably. Of course, the first step toward construction should be the selection of a board of the most competent engineers to be found in the country, none of them now in the Government service; this board to pass on and approve every step before it is taken. The selection of these men will be of more importance than any other single administrative feature of this proposed project.

"The Bureau of Reclamation has in its files data covering our river relations with Mexico and of the joint uses now being made of its waters. It has soil studies of the lands to be irrigated by this project. It is familiar with and approves the provisions of the Colorado River compact, which is a vital feature of this entire plan. It has in hand the engineering studies, maps, and conclusions bearing on the different interests to be served, up to the just completed studies on the conveying of water to Los Angeles for domestic use.

"The many interests, each vitally concerned in this project, must be studied separately and alone, then in their relation to the whole.

"The two large cities immediately interested in this river water for domestic use are Denver and Los Angeles, both outside of the Colorado River Basin; the former at the river's sources, the latter near its mouth, 1,000 miles distant from each other.

"The only irreplaceable known mineral is water. We now know how much may be expected to fall from the clouds in the form of rain and snow. We know that the annual consumption of water now equals the available supply. Nothing possible remains for man to do but to store and distribute this one essential of life to those first needing it, and arrange for storage of more as our increasing population may demand, when gathered in its last channels, to regulate its flow by man's ingenuity, so that its volume may no longer be a menace but be held in reserve to offset the annual drought of arid regions.

"The necessity for foresight in the storage of water for present and subsequent use each year becomes more apparent. It should be safeguarded and used in the upper reaches of streams first if we are to secure the largest future use and provide for the necessities of our own people along streams. Water when spread upon the surface in the upper valleys will find its own way back to the stream, to be used again and again.

"The proposed Colorado River compact to guard the rights between States, between the upper and lower river basins; the Colorado River Dam, with its unrivalled power possibilities, promising protection against floods, domestic water for great and growing cities; and an all-American canal for Americans, to avoid future international disagreements between the administrations of now friendly Republics, comprise, I believe, the most constructive legislation now before Congress."

July 17, 1926—Dr. Elwood Mead Day

On the Belle Fourche project, South Dakota

THE annual farm picnic at the United States Experimental Farm, near Newell, S. Dak., on the Belle Fourche project, is to be known this year as "Dr. Elwood Mead Day," in honor of the commissioner of the Bureau of Reclamation. In accepting the invitation to be present, extended by the officers of the irrigation district and the Newell Community Club, Doctor Mead wrote as follows:

"Your cordial invitation to attend the annual picnic on July 17 was acknowledged a few days ago. Since then it has had more consideration and I have decided to attend, regardless of other demands on my time and the distance that is involved.

"This conclusion has been reached because the people on the Belle Fourche project are showing such fine spirit and are moving forward in such a constructive fashion to make this project all that it ought to be, that it is up to the members of the Reclamation Bureau to do everything in our power to give this project its proper place in the sun and to make it known to qualified farm buyers and home seekers.

"This picnic can and should be made an instrument for calling the attention of the country to what is being accomplished in the upbuilding of this project. I will bring with me a photographer equipped to take motion pictures and photographs of prosperous and unoccupied farms. These will be used in the preparation of lantern slides and to illustrate magazine articles. I will endeavor to have a representative of one or more of the press syndicates come at that time and go over the project.

"Mr. Kreutzer will visit you at an early date and help in the preparation of plans. What we want is to have the project looking as well as it ever did, and to have by that time a list of farms that will furnish attractive opportunities to home seekers. I hope it can be arranged for the governor of the State and the congressional delegation to be present. Mr. Williamson should be there by all means. We will bring this matter to the attention of the railroads and the sugar-beet people and try to have representative officers there at that time, so we can have a conference over measures for the development of the project and for letting the world know what it has to offer.

"The spirit you are manifesting and the measures now under way give me confidence that the Belle Fourche project will, in the near future, be ranked among our successful irrigation undertakings."

Pacific Slope States Produced Bumper Crops

The 11 States of the Pacific slope harvested in 1925 crops that exceeded in value by $168,531,000 the agricultural output of 1924, according to the Mercantile Trust Review of the Pacific.

The estimated value of the crops of the region for that year was in excess of $1,250,000,000, and was greater than in any other year since 1900. The Pacific slope supplied more than 13 per cent of the country's income from its farms. The region showed a substantial increase in the farm value of its crops in the face of a decline of $447,116,000 in the value of the nation's harvest in 1925 as compared with 1924. Had it not been for the increase in the Pacific and Mountain States, crop values would have shown a decline for the country as a whole of $615,647,000.

Potatoes are grown in every State in the Union and move in carload quantities every day in the year. Approximately 33 per cent of the 418,000,000 bushels produced annually are shipped by rail.

Women on the Projects and Their Relation to Better Agriculture

The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life

By Mae A. Schnurr, secretary to the commissioner and associate editor, New Reclamation Era

GATHERING data for this section has indeed become a delight. I had no idea there were so many sources for its procurement and the helpful and cooperative spirit I have found everywhere has not only lightened my task but has been very gratifying. Everyone wants to contribute his or her bit to any effort that has as its goal the betterment of farm conditions from all standpoints. Interest is widespread and the technical man and woman as well as the laymen are continually studying ways and means to accomplish this end.

More schools and colleges, are, by popular demand, establishing courses designed to make the farm home attractive and the haven of healthy, contented, and happy families.

The engineer, the agriculturalist, the architect, and the home economist do not vie for individual honors, but on the contrary have banded together for an organized effort to work out the knotty problems presented.

"Last But Not Least"

Beautifying the Project Home Surroundings

A beautiful home may be materially enhanced in attractiveness by improving its surroundings, or to state it differently, the beauty of a home is brought out by attractive surroundings.

Trees, well placed, not only give effect but are very practical, giving the cool, refreshing shade so desirable during the hot months. On account of the length of time it takes to grow a good-sized shade tree this should be your first step to improve the grounds.

Considerable thought should be given to their location. They might be advantageously placed near each corner of the house but not so as to obstruct the view. Other trees may be placed around the grounds, keeping in mind the retention of your view from the front of the house or from a porch.

Your next step is well-arranged shrubbery. If you have an appreciation of the beautiful your imagination, allowed to roam, will dictate arrangement.

Flowering plants selected with a view to having blooms throughout the season are best.

Add a window box or two, or a trellis. They are inexpensive and easily made. You will be rewarded by the effect.

One of the better homes on the Yakima project, Washington

Women in Relation to the Project Home

By Miss Helen C. Willsey, Bureau of Reclamation, Boise, Idaho

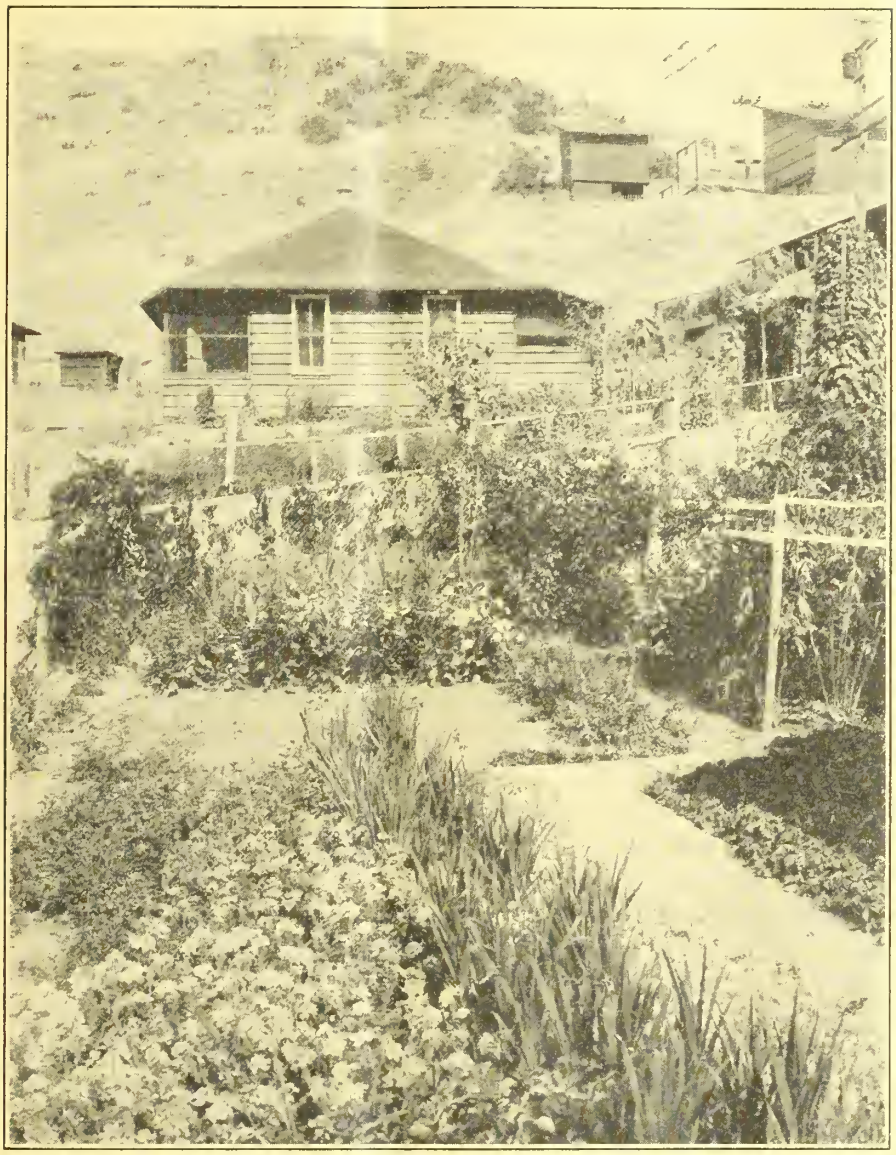
THERE are rather a diversity of homes on the Boise project. Some are homey, well cared for and prosperous looking; others are not. This phase of the matter depends to a great extent on the project wife. Some women are natural-born homemakers and their energy is unbounded in making the house and grounds livable and beautiful. Also some go to unlimited effort in their culinary arts and keep the health standard up by preparing nourishing and well-balanced meals. In addition some of them care completely for a flock of chickens or a vegetable garden from which a supply of winter vegetables can be stored away. This helps materially in the success of a farm and has more than once tided the farmer over a rough place.

One woman on the Boise project has made a successful venture with a half-acre strawberry patch. She cared for this in addition to her housework and during the strawberry season sold her berries each day, right at her door, to a truckman who peddled them to the town districts. At the close of one season, deducting harvesting expense, she realized $250 for her work and had a generous home supply canned.

She related that the work in her strawberry patch benefited her health as it kept her almost constantly in the sunshine, besides breaking the monotony of housework.

Another wife has realized a sideline profit on squabs which she dresses for hotel use.

Another project woman saw the demand for the good old home churned buttermilk, which doctors are recommending so much now for diets. Because the farm supply of milk is sold directly to creameries and condenseries, home buttermilk is almost passé. This woman gathered together the necessary buttermaking equipment and installed it in an unused portion of the milk house. She not only sold the butter but also the buttermilk and received for the latter as much as she would for whole milk. This same



A little bit of sunshine at Arrowrock Dam, Boise project, Idaho

project wife, when her milk house was being constructed, insisted that the workman install tiny long landscape windows and window boxes which she filled with flowering plants that made gay splashes of color against the walls. The milk house suggested more of a refuge of pleasure than a mechanical workhouse.

More and more farm women realize that touches of color and beauty smooth down the rough edges of farm work, making it a pleasure instead of a drudgery.

The primary object of a community canning kitchen is to secure the best returns for the time, effort, and capital invested. Hence the use of modern labor-saving equipment will prove economical in the end.

Arthur Brisbane Lauds Frost-free Yuma Mesa

Writing from Yuma, Arthur Brisbane pictures the Yuma Mesa as follows in a recent article in the Washington (D. C.) Herald:

"Imagine, you that have never seen this enchanted Yuma Mesa, a table-land where orange growers have no smudge pots, because they have never had a frost, where they never spray or fumigate, because they have no scale or other insect pest to worry them, and where the State government watches every plant, fruit, or seed that enters its territory, to keep out danger."

Sun River Project Boys Take Smith-Hughes Work

A recent clipping from the Great Falls Tribune, forwarded by Superintendent Sanford of the Sun River project, Montana, states that more than 30 boys of the Simms high school and junior high school are engaged in Smith-Hughes agricultural project work for the coming year. The agricultural principles taught in school are put into practice by carrying on these projects. The boys carefully plan their work, do the tasks themselves, keep records, and make a final summary.

One of the outstanding projects of the past year was that conducted by Bruce Garlinghouse, a son of one of the project water users living near Simms. Bruce made $800 from three acres of potatoes. When asked how he succeeded so well he said, "I worked hard and put the ideas that I got from the schoolroom into practice.

Total receipts from project work in the past year at Simms amounted to $3,747.92 and the net profits were $2,443.63. The school plans to double these figures in the coming year.

Superintendent Sanford adds that whenever there are competitive meets, it is always noted that the boys from Simms make an excellent showing, particularly in judging livestock and agricultural products.

Milk River Project Sugar Beets in 1925

In the table on page 43 of the March issue of the New Reclamation Era, showing acreage, yield, and value of sugar beets grown on the projects in 1925, the figures for the Milk River project covered only the Malta and Glasgow divisions. David Scott, agricultural superintendent of the Utah-Idaho Sugar Co., has furnished the following figures for the Chinook division:

Total acreage planted in Blaine County	2,483
Total acreage harvested	2,000
Total acreage not harvested	483
Total tons harvested on 2,000 acres	16,807

Using these figures the first three items in the table for the project would be increased to the following:

Acreage	3,009
Yield (tons)	24,579
Yield per acre (tons)	8.2

The total value would amount to about $151,360 and the total value per acre would remain at about $50.50.

Legislation Relating to the Federal Irrigation Projects

The appropriation act for the Bureau of Reclamation and other enactments relating to the irrigation of arid lands in the West, including an appropriation for an investigation of the Columbia River and providing for fair grounds on Shoshone project, Wyoming

Appropriations for 1927

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of the Interior for the fiscal year ending June 30, 1927, namely:

* * * * * * *

BUREAU OF RECLAMATION

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:

For all expenditures authorized by the act of June 17, 1902 (Thirty-second Statutes, p. 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 personal services in the District of Columbia and elsewhere; examination of estimates for appropriations in the field; refunds of overcollections hereafter received on account of water-right charges, rentals, and deposits for other purposes; printing and binding, not exceeding $30,000; purchase of rubber boots for official use by employees; purchase, maintenance, and operation of horse-drawn and motor-propelled passenger-carrying vehicles; 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; and 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 is hereby authorized, in his discretion, until June 30, 1927, to extend the time for payment of operation and maintenance of water-rental charges due and unpaid for such period as in his judgment may be necessary, not exceeding five years. The charges so extended shall bear interest, payable annually, at the rate of 6 per centum per annum until paid. The Secretary of the Interior is also authorized, in his discretion, until June 30, 1927, to contract with any irrigation district or water-users' association for the payment of the construction charges then remaining unpaid within such term of years, as the Secretary may find to be necessary. The construction charges due and unpaid when such contract is executed shall bear interest payable annually at the rate of 6 per centum per annum until paid.

No part of the sums provided for in this act for the Sun River, Owyhee, Vale, and Baker projects shall be expended 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 irrigation districts organized under State law providing for payment by the district or districts of the cost of constructing, operating, and maintaining the works during the time they are in control of the United States, such cost of constructing to be repaid within such terms of years as the Secretary may find to be necessary, in any event not more than 40 years from the date of public notice hereinafter referred to, and the execution of said contract or contracts shall have been confirmed by a decree of a court of competent jurisdiction. Upon such confirmation of such contract as to any one of such projects, the construction thereof shall proceed in accordance with any appropriations therefor provided for in this act. Prior to or in connection with the settlement and development of each of these projects, the Secretary of the Interior is authorized in his discretion to enter into agreement with the proper authorities of the State or States wherein said projects or divisions are located whereby such State or States shall cooperate with the United States in promoting the settlement of the projects or divisions after completion and in the securing and selecting of settlers. Such contract or contracts with irrigation districts hereinbefore referred to shall further provide that all irrigable land held in private ownership by any one owner in excess of 160 irrigable acres shall be appraised in a manner to be prescribed by the Secretary of the Interior and the sale prices thereof fixed by the Secretary on the basis of its actual bona fide value at the date of appraisal without reference to the proposed construction of the irrigation works; and that no such excess lands so held shall receive water from any project or division if the owners thereof shall refuse to execute valid recordable contracts for the sale of such lands under terms and conditions satisfactory to the Secretary of the Interior and at prices not to exceed those fixed by the Secretary of the Interior; and that until one-half the construction charges against said lands shall have been fully paid no sale of any such lands shall carry the right to receive water unless and until the purchase price involved in such sale is approved by the Secretary of the Interior and that upon proof of fraudulent representation as to the true consideration involved in such sales the Secretary of the Interior is authorized to cancel the water right attaching to the land involved in such fraudulent sales: *Provided further*, That the operation and maintenance charges on account of lands in said projects and divisions shall be paid annually in advance not later than March 1. It shall be the duty of the Secretary of the Interior to give public notice when water is actually available, and the operation and maintenance charges payable to the United States for the first year after such public notice shall be transferred to and paid as a part of the construction payment;

Salt River project, Arizona: For examination of project and project accounts, $3,000;

Yuma project, Arizona-California: For operation and maintenance, continuation of construction, and incidental operations, $400,000: *Provided*, That the unexpended balance of $72,000 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 1927:

Orland project, California: For operation and maintenance, continuation of construction, and incidental operations, $635,000;

Grand Valley project, Colorado, including Orchard Mesa division: For operation and maintenance, continuation of construction, and incidental operations, $80,000: *Provided*, That not to exceed $20,000 of the unexpended balance of the appropriation of $278,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1166), shall remain available for the fiscal year 1927;

Uncompahgre project, Colorado: For operation and maintenance, continuation of construction, and incidental operations, $145,000: *Provided*, That the Secretary of the Interior is authorized to use so much of this amount as may be necessary in investigating the feasibility of discontinuing the operation of any portion of this project and removing the water users now thereon to other lands elsewhere on the project and shall report hereon to Congress as early as may be practicable;

Boise project, Idaho: For operation and maintenance, continuation of construction, and incidental operations, $394,000: *Provided*, That the expenditure for drainage shall not exceed the amount paid by the water users pursuant to the provisions of the Boise public notice dated February 15, 1921, except for drainage in irrigation districts formed under State laws and upon the execution of agreements for the repayment to the United States of the costs thereof: *Provided further*, That the unexpended balance of the appropriation for the fiscal year 1926 made available by the act approved March 4, 1925, shall remain available for the fiscal year 1927 for development of storage facilities for the Black Canyon unit;

King Hill project, Idaho: Any moneys which may be advanced by the King Hill irrigation district for construction and operation and maintenance shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which contributed in like manner as if said sums had been specifically appropriated for said purposes;

Minidoka project, Idaho: For operation and maintenance, continuation of

construction, and incidental operations, $2,005,000: *Provided:* That the accumulated net profits as determined by the Secretary of the Interior, arising under the project, derived from the operation of the project power plants, leasing of Government grazing and farm lands, the sale and use of town sites, and from all other sources, shall be applied by the Secretary of the Interior, so far as may be necessary, in payment of any water-right charges due the United States by any individual water user or irrigation district to whose benefit personally or in the aggregate such accumulated profits should equitably accrue in the judgment of the Secretary of the Interior, whose decision shall be conclusive. Any surplus of such accumulated net profits and future profits from such sources shall be applied as provided by subsection I, section 4, act of December 5, 1924 (Forty-third Statutes, p. 701);

Huntley project, Montana: For operation and maintenance, continuation of construction, and incidental operations, $36,000: *Provided,* That 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, p. 1166), shall remain available for the fiscal year 1927;

Milk River project, Montana: For operation and maintenance, continuation of construction, and incidental operations, $72,000, and no part of this amount shall be available for maintenance and operation of the Glasgow division after December 31, 1926, unless 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 providing for payment of construction and operation and maintenance charges for such district or districts: *Provided,* That no part of this amount shall be available for maintenance and operation of the Malta division after December 31, 1926, unless 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 providing for payment of construction and operation and maintenance charges by such district or districts: *Provided further,* That any moneys which may be advanced for construction and operation and maintenance of the said Malta division after December 31, 1926, or of the Glasgow division hereafter shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which contributed in like manner as if said funds had been specifically appropriated for said purposes;

Sun River project, Montana: For operation and maintenance, continuation of construction and incidental operations, $59,000: *Provided,* That the unexpended balance of the appropriation of $611,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927: *Provided,* That the restrictions carried elsewhere in this act upon the use of appropriations for construction purposes upon the Sun River and certain other projects shall not be deemed to apply to the construction of the Beaver Creek Reservoir;

Lower Yellowstone project, Montana-North Dakota: For operation and maintenance, continuation of construction, and incidental operations, $72,000: *Provided,* That not to exceed $65,000 of the unexpended balance of the appropriation of $180,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927: *Provided further,* That no part of this amount shall be available for maintenance and operation after December 31, 1926, unless 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 providing for payment of construction and operation and maintenance charges by such district or districts;

North Platte project, Nebraska-Wyoming: For operation and maintenance, continuation of construction, and incidental operations, $1,500,000: *Provided,* That no part of this amount shall be available for maintenance and operation of any division of the project after December 31, 1926, unless a contract or contracts shall have been made with an irrigation district or with irrigation districts organized under State law providing for payment of construction and operation and maintenance charges against lands of that division by such district or districts.

Newlands project, Nevada: For operation and maintenance, continuation of construction, and incidental operations, $135,000: *Provided,* That not to exceed $17,000 of the unexpended balance of the appropriation of $167,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927: *Provided further,* That the appropriation of $245,000 made available by the act of June 5, 1924 (Forty-third Statutes, p. 415), and reappropriated for the fiscal year 1926 by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927 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;

Newlands project, Spanish Springs division, Nevada: For continued investigations, commencement or continuation of construction, and incidental operations, the unexpended balance of the appropriation of $500,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1167), shall remain available for the fiscal year 1927: *Provided,* That no water shall be delivered to irrigators on this division outside of the limits of the Truckee-Carson irrigation district 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 providing for payment by the district or districts of the cost of constructing, operating, and maintaining the works during the time they are in the control of the United States, such cost of constructing to be repaid within such terms of years as the Secretary may find to be necessary, in any event not more than 40 years from the date of public notice hereinafter referred to, and the execution of said contract or contracts shall have been confirmed by a decree of a court of competent jurisdiction. Prior to or in connection with the settlement and development of each of these projects, the Secretary of the Interior is authorized in his discretion to enter into agreement with the proper authorities of the State whereby such State shall cooperate with the United States in promoting the settlement of the projects or divisions after completion and in the securing and selecting of settlers. Such contract or contracts with irrigation districts hereinbefore referred to shall further provide that all irrigable land held in private ownership by any one owner in excess of 160 irrigable acres shall be appraised in a manner to be prescribed by the Secrtary of the Interior and the sale prices thereof affixed by the Secretary on the basis of its actual bona fide value at the date of appraisal without reference to the proposed construction of the irrigation works; and that no such excess lands so held shall receive water from the division if the owners thereof shall refuse to execute valid recordable contracts for sale of such lands under terms and conditions satisfactory to the Secretary of the Interior and at prices not to exceed those fixed by the Secretary of the Interior, and that until one-half of the construction charges against said lands shall have been fully paid no sale of any such lands shall carry the right to receive water unless and until the purchase price involved in such sale is approved by the Secretary of the Interior, and that upon proof of fraudulent representation as to the true consideration involved in such sales the Secretary of the Interior is authorized to cancel the water right attaching to the land involved in such fraudulent sales: *Provided further,* That the operation and maintenance charges on account of lands in said division shall be paid annually in advance not later than March 1. It shall be the duty of the Secretary of the Interior to give public notice when water is actually available, and the operation and maintenance charges payable to the United States for the first year after such public notice shall be transferred to and paid as a part of the construction payment;

Carlsbad project, New Mexico: For operation, maintenance, continuation of construction, and incidental operations, $50,000;

Rio Grande project, New Mexico-Texas: For operation and maintenance, continuation of construction, and incidental operations, $507,000;

Owyhee project, Oregon: For continued investigations, commencement or continuation of construction, operation and maintenance, and incidental operations, the unexpended balance of the appropriation of $315,000, made available by the act of December 5, 1924 (Forty-third Statutes, p. 685), and reappropriated for the fiscal year 1926 by the act of March 3, 1925 (Forty-third Statutes, p. 1168), shall remain available for the fiscal year 1927;

Umatilla project, Oregon: For operation and maintenance, continuation of construction, and incidental operations, $407,000;

Vale project, Oregon: For continued investigations, commencement or continuation of construction, and incidental operations, the unexpended balance of the appropriation of $500,000 for the fiscal year 1926, made available by the

(Continued on page 100)

Appropriations for Reclamation During the Coming Fiscal Year

Funds made available by Congress for old and new projects should make 1927 one of the banner construction years in the history of reclamation work in the Western States—Investigations in the South provided for

(Continued from page 99)

act of March 3, 1925 (Forty-third Statutes, p. 1168), shall remain available for the fiscal year 1927: *Provided*, That not more than $200,000 of the amount herein appropriated shall be available for purchases of a proportionate interest in the existing storage reservoir of the Warm Springs project, said interest to be conveyed to the United States free of all prior liens and encumbrances of every kind whatever: *Provided further*, That the contract for the purchase of said interest in said reservoir shall also provide for construction of the necessary drainage works by the said Warm Springs and Vale projects and the proportion of cost of said works to be borne by each;

Baker project, Oregon: For investigation, commencement of construction, and incidental operations, the unexpended balance of the appropriation for this purpose for the fiscal year 1926 is reappropriated and made available for the fiscal year 1927;

Klamath project, Oregon-California: For operation and maintenance, continuation of construction, and incidental operations, $140,000: *Provided*, That the unexpended balance of the appropriation made available by the act of March 3, 1925 (Forty-third Statutes, p. 1169), shall remain available for the fiscal year 1927;

Belle Fourche project, South Dakota: For operation and maintenance, continuation of construction, and incidental operations, $40,000;

Strawberry Valley project, Utah: For operation and maintenance, continuation of construction, and incidental operations, $39,000;

Salt Lake Basin project, Utah, first division: For continued investigations, construction of Echo Reservoir, Utah Lake control, and Weber-Provo Canal, operation and maintenance, and incidental operations, the unexpended balance of any appropriation available for these purposes for the fiscal year 1926 shall be available during the fiscal year 1927: *Provided*, 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: *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. It shall be the duty of the Secretary of the Interior to give public notice when water is actually available for such lands, and the operation and maintenance charges, if any, payable to the United States for the first year after such public notice shall be transferred to and paid as a part of the construction payment;

Okanogan project, Washington: For operation and maintenance, continuation of construction, and incidental operations, $65,000;

Yakima project, Washington: For operation and maintenance, continuation of construction, and incidental operations, $294,000;

Yakima project (Kittitas division), Washington: For continued investigations, commencement or continuation of construction, operation and maintenance

Appropriations for reclamation 1926 and 1927

Project	Interior Department appropriation act fiscal year 1927, approved May 10, 1926	Prior appropriations continued available, fiscal year 1927, by act of May 10, 1926 [1]	First deficiency act approved Mar. 3, 1926
Salt River	$3,000		
Yuma	400,000		
Yuma auxiliary		$72,000	
Orland	635,000		
Grand Valley	80,000	20,000	
Uncompahgre	145,000		
Boise [2]	394,000	111,000	
King Hill	[3]		
Minidoka [4]	2,005,000		
Huntley	36,000	60,000	
Milk River [5]	72,000		
Sun River	59,000	611,000	
Lower Yellowstone [5]	72,000	65,000	
North Platte [5]	1,500,000		$300,000
Newlands	135,000	262,000	
Newlands-Spanish Springs		500,000	
Carlsbad	56,000		
Rio Grande	507,000		
Owyhee		315,000	
Umatilla	407,000		
Vale		500,000	
Baker		500,000	
Klamath	140,000	561,000	
Belle Fourche	40,000		
Strawberry Valley	39,000		
Salt Lake Basin		1,275,000	
Okanogan	65,000		
Yakima	294,000		
Yakima-Kittitas		750,000	2,000,000
Riverton	50,000		
Shoshone [6]	128,000	150,000	
Secondary	75,000		
Economic investigations	100,000		
Total from reclamation fund	7,431,000	[1] 5,752,000	2,300,000
Miscellaneous items: North Platte—judgment, The Bothwell Co			22,134
Colorado River front work and levee system [7]	35,000		
Investigations of arid, semiarid, swamp, and cutover timberlands	15,000		
Total	7,481,000	[1] 5,752,000	2,322,134

[1] Limited to unexpended balances of amounts shown.
[2] Additional appropriation of $50,000 proposed in second deficiency bill, fiscal year 1926.
[3] Authorizes expenditure of any funds advanced by the King Hill irrigation district.
[4] Does not include funds contributed by contractors participating in construction of American Falls Reservoir.
[5] Not available for operation and maintenance after Dec. 31, 1926, unless appropriate contracts are entered into with irrigation districts.
[6] Not available for operation and maintenance of Frannie division after Dec. 31, 1926. Authorizes expenditure of funds advanced for construction and operation and maintenance of this division after that date.
[7] To be transferred from General Treasury to reclamation fund.

and incidental operations, the unexpended balance of the appropriation of $375,000, made available by the act of December 5, 1924 (Forty-third Statutes, p. 685), and reappropriated for the fiscal year 1926, by the act of March 3, 1925 (Forty-third Statutes, p. 1170), and the unexpended balance of the $375,000 additional made available by the act of March 3, 1925 (Forty-third Statutes, p. 1170), shall remain available during the fiscal year 1927;

Riverton project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations, to be immediately available, $50,000.

Shoshone project, Wyoming: For operation and maintenance, continuation of construction, and incidental operations and investigation of remainder of project, $128,000: *Provided*, That no part of this amount shall be available for maintenance and operation of the Frannie division after December 31, 1926, and that any moneys which may be advanced for construction and operation and maintenance of the said Frannie division after that date shall be covered into the reclamation fund and shall be available for expenditure for the purposes for which contributed in like manner as if said funds had been specifically appropriated for said purposes: *Provided further*, That the Secretary of the Interior is authorized to use so much of this amount as may be necessary in investigating the feasibility of discontinuing the operation of any portion of this project and removing the water users thereon to other lands elsewhere on the project and shall report hereon to Congress as early as may be practicable: *Provided further*, That not to exceed $150,000 of the unexpended balance of the appropriation of $414,000 for the fiscal year 1926, made available by the act of March 3, 1925 (Forty-third Statutes, p. 1171), shall remain available for the fiscal year 1927;

Secondary projects: For cooperative and general investigations, $75,000;

Economic investigations and development of reclamation projects: For investigations necessary to determine the economic conditions and financial feasibility of new projects, and for investigations relating to the reorganization and financial adjustments of existing projects, including examination of soils, classification of land, 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 are 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 1927, 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 1927

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;

Whenever, during the fiscal year ending June 30, 1927, 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 $7,431,000.

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 (Forty-third Statutes, 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 (Thirty-second Statutes, 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 1927 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 timber lands 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 (Forty-third Statutes, 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 reclamation projects, $15,000.

* * * * *

SEC. 2. Appropriations herein made for field work under * * * the Bureau of Reclamation, * * * shall be available for the hire, with or without personal services, of work animals and animal-drawn and motor-propelled vehicles and equipment.

Approved May 10, 1926. (Public No. 206.)

Columbia River Investigation

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the provisions of the act of March 4, 1925, entitled "An act to permit a compact or agreement between the States of Washington, Idaho, Oregon, and Montana respecting the disposition and apportionment of the waters of the Columbia River and its tributaries, and for other purposes," be continued and extended, and the said States are hereby authorized to negotiate or enter into a compact or agreement and report to Congress in accordance with the provisions of the said act not later than December 1, 1927.

SEC. 2. There is hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, the sum of not more than $25,000, for completing investigations of the feasibility of irrigation by gravity or pumping, water sources, water storage, and related problems on the Columbia River and its tributaries, including the Columbia Basin project.

Approved April 13, 1926. (Public, No. 112.)

Fair Grounds, Shoshone Project

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 be, and he is hereby, authorized and directed to cause a patent to issue conveying blocks 3, 4, 5, 14, 15, 16, and the east half of blocks 6 and 13, town site of Powell, on the Shoshone reclamation project, Wyoming, to Park County, Wyoming, in trust for use as a county fair grounds; but in said patent there shall be reserved to the United States all oil, coal, and other mineral deposits within said lands and the right to prospect for, mine, and remove the same.

SEC. 2. The conveyance herein is made upon the express condition that within thirty days of the receipt of any request therefor from the Secretary of the Interior the county clerk of Park County, Wyoming, shall submit to the Secretary of the Interior a report as to the use made of the land herein granted the county during the preceding period named in such request, showing compliance with the terms and conditions stated in this act; and that in the event of his failure to so report, or in the event of a showing in such report to the Secretary of the Interior that the terms of the grant have not been complied with, the grant shall be held to be forfeited, and the title shall revert to the United States, and the Secretary of the Interior is hereby authorized and empowered to determine the facts and declare such forfeiture and such reversion and restore said land to the public domain, and such order of the Secretary shall be final and conclusive.

Approved April 3, 1926. (Public, No. 91.)

Umatilla Project Bees Make Early Spring Start

The Hermiston Herald states that honey bees on the Umatilla project, Oregon, are living up to their reputation of industry. The bees started to work earlier this year than ever before, and indications are that the honey flow will be better than in normal years.

J. Skovbo, a water user on the project who has a large apiary, took off several pounds of honey about the middle of March. To take new honey from a colony at this date establishes a new record for the project. Examination of the colonies showed that the bees were making more than enough honey to feed themselves.

According to the Bureau of Railway Economics, Idaho potatoes are shipped into 33 States, the maximum rail haul amounting to 2,970 miles.

Refund Certificate on Retirement Deductions

The certificate of the administrative officer accompanying each application for refund of retirement deductions makes provision for the inclusion of service and deductions in other branches of the Government service. Field officers sometimes construe this part of the certificate as referring to service and deductions in the Bureau of Reclamation. The blanks in the paragraph immediately following the tabulation of deductions by fiscal years should not be filled in unless field offices have received information therefor in the form of a certified abstract of official record from another department, bureau, or office.

Potato shipments represent 34 per cent of the total rail shipments of all fruits and vegetables, according to the Bureau of Railway Economics.

Study of Farm Problems in Yakima Valley, Wash.

A study of farm management problems on irrigated farms in hay and potato areas of the Yakima Valley, Wash., has been concluded recently by the Department of Agriculture. According to the report, "marketing possibilities for local farm products are among the prineipal factors in determining farm earnings in this area. Yakima Valley potato growers have several marketing advantages over their competitors in Northwestern States, chief among which are a low production per capita in Washington, resulting in a favorable local market, a shorter rail haul to Pacific coast cities, and the advantage of a rail-and-boat rate to California markets."

Well-balanced, palatable feeds are necessary to get good egg production.

121851

Newlands Project, Nevada, Agricultural Extension Program, 1926

A comprehensive outline of what it is proposed to accomplish this season in bringing about better agricultural, livestock, and marketing conditions on the project through extension work

By L. E. Cline, associate agriculturist

AGRICULTURAL extension work on the Newlands project will be conducted along lines emphasized in the following outline, providing that emergencies do not arise to make it necessary or desirable to make changes.

The subject that has been considered of first importance in agricultural extension work by this office for the Newlands project has been that of dairy development. This will take precedence over other lines of work during 1926. Under the head of dairy development will be the following activities, listed in the order of the emphasis that will be placed upon them during the year:

DAIRY INDUSTRY

A. Extension of the dairy industry.
   1. Selection of foundation animals and herds.
   2. Propaganda for popularizing dairying.

B. Herd improvement.
   1. Herd testing.
      (*a*) Organizing a 1926 herd-testing association.
      (*b*) Interpreting results of herd testing for members of the association, and giving general publicity to herd-testing results.
   2. Culling inferior cows.
   3. Purebred-sire campaign.

C. Herd management.
   1. Better animal husbandry.
   2. Better housing facilities.
      (*a*) Publicity to stimulate building of new barns.
   3. Contagious-disease control in cooperation with State disease-control service.
   4. Nursing and handling of minor ailments of dairy animals.
      (*a*) Special educational work along the lines of breeding troubles.

D. Feeding.
   1. Supplemental grain feeds for local conditions, to be studied in connection with United States Experiment Station feeding tests.
   2. Mixed grass pasture demonstrations to be continued.
   3. Large pastures to be encouraged.
   4. Continued studies of mineral rations for producing cows.
   5. Silage supplements to alfalfa to be studied at feeding demonstration at United States Experiment Station, and results given to local dairymen.
   6. Sweet clover and rye pastures for alkali lands to be encouraged.

E. Importations.
   1. Assisting project farmers in selection of dairy bulls for importations, when satisfactory ones can not be had locally.
   2. Encouraging new settlers with dairy herds from outside the project to come in.

POULTRY INDUSTRY

TURKEYS

A. Stimulating increased production.
   1. Pointing out local advantages for the industry.
   2. Stimulating interest in better housing.

B. Feeding.
   1. To study feeding methods now in practice on the farms, and endeavor to determine the most successful one, and give it general publicity.
   2. Additional information to be secured on growing and fattening turkeys under farm conditions.
   3. Special emphasis to be placed on growing home feeds for turkey production.

C. Disease control.
   1. Special efforts to be made in disseminating information on methods of combatting blackhead and chicken pox in turkeys.
   2. Further studies to be made of blackhead treatment.

D. Marketing.
   1. Marketing of turkeys from the project, deserves much attention.
   2. General survey of the supply of turkeys on the Pacific coast, will be made the same as in 1925. A special effort will be made to attract buyers to this locality and discourage consigning turkeys to commission men.
   3. A continual effort will be made to encourage a superior product in the Fallon turkey, and to attract new buyers, whenever possible.

CHICKENS

A. Stimulating the chicken industry.
   1. An endeavor will be made to stimulate egg production as a side line to dairying for the purpose of utilizing skim milk.
   2. To offset the handicap of the alfalfa hay quarantine, an effort will be made to encourage poultry growing on more farms and the conversion of some of the alfalfa acreage to corn and wheat production for feeding poultry.
   3. A list of accredited hatcheries will be kept in the office and every effort will be made to encourage the buying of only high-class baby chicks.

B. Feeding.
   1. Proper rations for laying hens and growing chickens from locally grown feeds so far as possible.
   2. More encouragement to be given producers of locally compounded poultry foods.

C. Project egg-laying contest to be fostered in cooperation with State egg-laying contest, and publicity to be given the results.

D. Greater emphasis to be laid on culling of farm flocks.
   1. Demonstrations to be given showing the benefits from culling.

E. Contagious disease control work to be done in cooperation with State disease control office.
   1. Special lectures to be staged on poultry diseases at annual poultry school, to be held in February.

F. Marketing.
   1. An effort will be made to establish a new egg-marketing arrangement for the project.
   2. Cooperative organization will be the goal.

SHEEP PRODUCTION

A. Stimulating the industry.
   1. General publicity will be given to possible profits in sheep husbandry on the project in an effort to encourage more farm flocks.
   2. A greater utilization of alfalfa hay is needed.
   3. Data to be gathered from local sheep farmers as to profits from farm flocks, and these figures to be used to encourage others.

B. Permanent sheep pastures to be encouraged to facilitate handling sheep.

C. Sources of supply for foundation farm flocks will be investigated and made available to prospective buyers.

SWINE PRODUCTION

There seems to be ample justification for encouraging swine production on the project in 1926. Now that there is need to reduce the alfalfa acreage, greater production of grain must take its place, and since hogs provide a very profitable market for grain, with pork at present prices, it seems advisable to encourage swine production. Most of the dairy

(Continued on page 103)

New Industry for the Orland Project

Preserving Kadota Figs

By Mrs. Sadie Tolle, Orland, Calif.

Kadota fig-preserving plant, Orland project, California

ORLAND project, California, "The Project of No Regrets," has just begun to realize the possibilities of the Kadota fig industry. Of course, it was known generally that the Orland climate was ideal for fig growing. Long before the water came there were fig trees, mostly of the Black Mission variety, bearing heavy crops of figs year after year. But they were good only for drying, and people did not seem to be especially fond of dried figs. Then came the Kadota fig, golden fruit of honey sweetness, thin of skin and without seeds. Few fruits are so delicious when preserved.

However, little was known of the growing and bearing habits of the new variety. In 1919 a small nursery was established near Orland. Even in the nursery row the baby trees bore figs. Every tree was planted. Some were set along the borders of the alfalfa fields. There were only enough trees for about 100 acres. That acreage was added to from year to year. Three and four-year old trees showed figs in every stage of development, for the Kadota fig bears almost continuously from the middle of July until frost.

BUILDING UP THE MARKET

Financially, the venture was still a failure, for there was no local market for the everincreasing supply. Canned figs were not found on many tables. In 1924 the growers organized the Orland Fig Growers Association, and in 1925 they operated their own cannery, with the result that fig growing proved to be one of the most profitable industries on the Orland project. The cannery was not ready to receive fruit until August, and it closed the season's run on November 10, handling 11,799 pounds of fruit. The preserved product found a ready market, and large orders were turned down for want of fruit. During the latter part of the season part of the fresh fruit was candied, which proved even more profitable than preserving. The cannery employed 25 women and 5 men, and the organization plans to secure more spacious quarters and enlarge its force during the coming season.

INCREASED ACREAGE ASSURED

Kadota fig trees are headed close to the ground, thus making the harvesting easy. Last season many school children picked figs, finding profitable employment during vacation. The 1925 project crop census report gives the acreage of bearing figs as 125 acres, but there are close to 500 acres set out to Kadota figs within the project, and no doubt many more trees will go in this coming spring. All kinds of soils are included in the acreage already in figs and the trees seem to do well in each. On one farm where the trees are planted along the alfalfa border, the yield and quality of fruit proved equal to any.

REVENUE WITHOUT WORRY

The Kadota fig is practically free from disease and insect pests and when once established needs little care or pruning. After a fig orchard comes into bearing the owner need have no worries that his trees will wear out and die off, as no other fruit tree is so long lived as the fig tree.

And so another industry is added to the Orland project's resources, whereby more dollars will come to the settlers to be put back into comfortable homes. When you want something that is most delicious try a glass of preserved Kadota figs.

Newlands Project Extension Program

(Continued from page 102)

farms can handle hogs to advantage as a side line.

Cooperative marketing of hogs will be taken up again when there are sufficient hogs to justify it.

RABBIT PRODUCTION

The production of rabbits for meat purposes will receive its due amount of attention. It is an industry worth encouraging on the Newlands project. This work will be taken up under the following heads:

A. General management.
B. Housing accommodations.
C. Disease control.
D. Marketing.

FARM CROPS

The encouragement of corn growing will be emphasized. Treatment of seed wheat for smut will receive greater emphasis this coming year. The spraying of fruit trees will be taken up at the proper time. The treatment of potato seed to combat potato diseases will be emphasized at the proper time. The growing of Fallon celery justifies increased attention for local and near-by markets.

OTHER ACTIVITIES

Attention will also be given to publicity, boys' and girls' club work, and rodent control.

Production of Daughters Shows Value of Dairy Sire

The best way to determine the true value of the dairy bull is through the production records of his daughters. If a dairy bull has many daughters, and all of these excel medium to low-producing dams, the sire has a certain value; if all the daughters excel medium to high-producing dams, the true value of the bull is comparatively high; but if all the daughters excel high-producing dams, the true value of the bull is very high.

Cost of Producing Apples and Pears On a Large Orchard, Yakima Project

THE cost of production is always a subject of great importance to the farmer as well as the Bureau of Reclamation, and the following costs obtained from one of the large orchards of the Yakima irrigation project, Washington, are of rather more than ordinary interest on account of their clearness and accuracy.

This orchard is owned by nonresidents, but is in charge of an experienced and efficient manager. Absolutely every item of cost must be paid for and is taken into the books. Also, such items as depreciation, interest on loans, taxes, and even loss on livestock are taken into consideration, and the owners carry their own insurance on both fruit and buildings, which is included in the actual cost.

The tract consists of 228 acres, of which 211 are irrigable, 176 being in orchard and the balance in alfalfa and open ground. The main crops are cherries, pears, and apples. The cherries would cover about 4 acres, but line the main roadway and because of their location are charged only with the expense of harvesting and any other expense directly chargeable to them. In 1925 they sold 31,670 pounds of cherries, which cost $0.0216 to pack and put in the market 9 miles away.

Because of the planting of the orchard it is impossible to separate the pears and the apples. The 1925 crop was 60,158 boxes of apples and pears, of which 11,812 were sold in bulk. In arriving at the cost of production, however, the bulk fruit was figured on a packed basis.

COST OF A BOX OF APPLES

The 1925 cost of growing, harvesting, packing, and loading a box of apples or pears was $0.851, the principal items entering into this cost being as follows:

	Per box
Picking	$0. 119
Packing	. 1566
Box	. 160
Loading	. 0164
Grading fruit	. 0475
Total harvesting and packing expense	0. 4995
Irrigation	. 0264
Pruning	. 0159
Taxes	. 0158
Thinning	. 0483
Spraying	. 0937
Depreciation	. 0218
	. 2219
Total	. 7214

Had it been a straight apple orchard the cost per box would have been a little higher.

The ranch is well equipped in every way, including an adequate packing house. All fruit was packed on the ranch and the pears and apples hauled to cars on a spur track one-half mile from the ranch.

Objects of Keeping Good Dairy Records

Cow testing and diary records, while determining the absolute and relative yield capacity of cows, should be used—

1. For the elimination of cows whose yield is economically inadequate.

2. For the choice of the best milkers for purposes of reproduction.

3. For the selection of choice bulls on the basis of the dairy qualities of the dams, sisters, and, more particularly, the female progeny.

4. For the consequent establishment of families and lines whose milk is characterized by high fat content.

5. For improving the hygiene and feeding of the cows so as to obtain the maximum yield corresponding to their genetic constitution.

6. For genealogical and genetic experiments with special reference to the powers of transmitting the characteristics of good milking and butter fat content.—Dairy cow testing in different countries, International Institute of Agriculture.

Yakima Project Paper Notes Tieton Progress

"For a time we seldom got into a public meeting around here in which we did not have to listen to howls of anguish from the people up on the Tieton Government irrigation project. They all seemed to think that they were going broke, and the indications were that that was just about what would happen. The main trouble was that farmers up there had planted their lands mostly to trees and they did not have capital enough to carry on their operations until the returns began to come in, and about the time they did come the market went to the bad. Things are entirely different up on the Tieton to-day. Plans of a great many people having been worked out and a couple of good years having come along, that district has become one of the most prosperous in the Yakima Valley. It is also highly gratifying to find that it turns out to be one of the best. The Tieton soil is better than was suspected. The district is almost frost proof. The Tieton is now a steady and regular producer and the quality of its fruit probably is not surpassed anywhere on the American continent. At the present time the Tieton unit adjoining town is one of the most beautiful parts of the Yakima country. People who drive about will miss something if they neglect to take the grade up past the Garretson place and ramble around over the finely improved roads out beyond for a few hours most any day of this spring."—Yakima Republic, April 28, 1926.

Name Your Farm Home

The naming of the farm home is often the first step in general home improvement. There is an effort to live up to the spirit which has been embodied in the new name. The indirect effort of the name can often be seen in the grading and standardizing of products offered for sale.

Farm home owners should give considerable thought to the selection of the right name. It should be dignified, suitable, lasting, not too common, easy to say, easy to read, and easy to remember. It should appear on the mail box or over it, or on a signboard, or on the gate. It should be used on letterheads and on the label of anything sold from the farm.

A number of States have laws providing for the registry of farm names. Lists of several hundred suggested farm names were printed in the Reclamation Record from June to November, 1918. Turn to your back files of the Record and select a suitable name; or write us a description of your farm and its surroundings and we will be glad to send you a list of names from which selection may be made.

Buy Right Variety of Alfalfa Seed

Cutting alfalfa on the Newlands project, Nevada

BEFORE buying alfalfa seed there are three points upon which the purchaser should have information. They are: The name of the variety, the section of the country in which it was grown, and the quality of the seed with regard to both germination and purity.

The alfalfas of this country vary in their adaptation to climatic conditions and length of day, some giving the best results in the North and Northwest, whereas others succeed only in the South and Southwest. As an aid to the prospective grower of alfalfa in determining the variety to grow, Farmers' Bulletin 1467-F, Commercial Varieties of Alfalfa, discusses in detail the origin, adaptability, and establishment of five distinct groups and their subdivisions. The five groups are: Common, Turkestan, variegated, nonhardy, and yellow flowered.

Unfortunately it is not possible to distinguish between the varieties or strains of alfalfa by the appearance of the seed, and the tests that have so far been developed to assist in this connection are not of much practical benefit to the farmer. It is important, therefore, that dealings be had only with thoroughly reliable and intelligent seedsmen and growers.

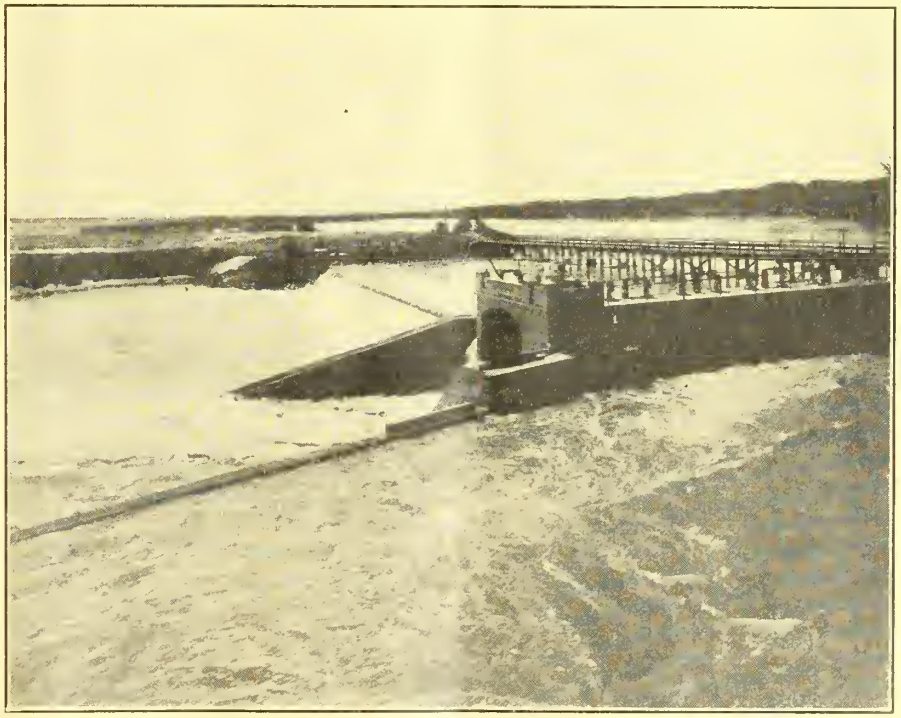
The variability of the seed, or its ability to start a strong plant, is clearly indicated in its appearance. Plump seed of a bright olive-green color almost invariably germinates well, while shriveled seed or seed that is of a brownish color usually germinates poorly. With age alfalfa seed turns a reddish-brown color. When a germination test is desired it can be made by placing 100 seeds between cloths or blotting paper and keeping them moist and at a temperature of about 70° F. After five or six days most of the viable seeds will have sprouted.

With regard to the purity of alfalfa seed, every farmer should be able to recognize readily the most important weed seeds and other impurities that are commonly found in it. Seed to be acceptable should not contain more than 2 per cent impurities. At the present time there is almost no attempt to adulterate alfalfa seed in this country, but every lot should be very carefully examined for seed of noxious weeds, especially dodder, before it is purchased. The seeds of dodder are smaller than those of alfalfa, more nearly round, and have a pitted surface which can be detected only by the aid of a lens. Dodder is a troublesome weed, and dodder-free seed should be demanded by the purchaser.

Different alfalfa varieties have been produced mostly in nature, with almost no intentional effort on the part of man. The hybrid varieties are natural crosses, and the distinct types of pure origin are the products of natural selection. However, it is hoped that the results of systematic plant breeding will be soon available to the general public, and that these efforts will produce strains or varieties that will be superior even to the best commercial ones now available.

A copy of the bulletin may be secured, as long as the supply lasts, by writing to the United States Department of Agriculture, Washington, D. C.

SEVEN applications, three of which were from ex-service men, for farms on the Riverton project. One of the ex-service men appeared before the examining board and was found to be properly qualified and assigned a farm unit. The other two are expected to meet with the board in the near future.



Whalen diversion dam, North Platte project, Nebraska-Wyoming

Notes From Our Projects 10 Years Ago

From the Reclamation Record of June, 1916

THE duties and authority of the Reclamation Service should be enlarged. In addition to the building of irrigation works, it should be given authority to prepare land for irrigation, and in some instances complete necessary improvements so that settlers can begin immediately the cultivation of the soil. The reason for this change is that leaving it to inexperienced settlers wastes money and time, delays settlement and the resultant income from water sales. It would be a good business policy. It is also what settlers most need to overcome the serious obstacles they now have to face.

Since the beginning of the century over a billion dollars has been furnished by different Governments to enable men of small capital to own the land they cultivate; the results have been little less than marvelous. In Australia it has created a new kind of agriculture, more than doubled the income from the State irrigation works, and caused new ones to be built by the State.

The principal features of all these systems are the same. They require that each settler shall have a certain minimum capital; shall be honest and industrious. To such settlers the State either makes the improvements needed to enable them to begin cultivation, the settlers paying part of the cost, or it loans the settler up to 60 per cent of the value of improvements after he has made them. The average interest rate under these systems is less than half what settlers have to pay here; the time of repayment is from 10 to 20 times as long as can be obtained here, and in addition, the payments are amortized, which is a feature of great value. To this financial aid there is added practical advice and direction to save the inexperienced beginners from costly mistakes and to see that they do the right thing at the right time.

If the Reclamation Service could introduce this system on its projects it would lift the burden of usurious interest from the necks of many settlers, insure the complete development of all districts, and make the act help many ambitious and deserving people to secure a home who can not attempt it under present conditions.—*From an article by Dr. Elwood Mead on "A needed increase in the scope of the work of the Reclamation Service."*

Substantial progress in the development of the Government reclamation projects is indicated by the census figures for irrigation and crop results in 1915. The total area watered and cropped under canals operated by the Government increased more than 50,000 acres over the previous year, bringing the irrigated acreage above 800,000 and the area from which crops were harvested to over 750,000 acres.

During 1915 the average for all reclamation projects in value of crops per acre was $24, an increase of 50 cents per acre in comparison with the statistics for 1914. At the same time the total production increased one and a half million dollars to over $18,000,000.

Two projects were added to those producing annual crops worth over a million dollars, the Uncompahgre, Colorado, and the North Platte, Nebraska-Wyoming. The Salt River project, Ari-

ANNUAL WATER CHARGES ON FEDERAL IRRIGATION PROJECTS—SEASON OF 1925 AND 1926

State	Project	Minimum charge per acre		Number of acre-feet delivered for minimum charge		Acre-foot charge in flood season		Acre-foot charge not in flood season		Acre-foot charge entire season		Charge for additional water per acre-foot	
		1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926
Arizona	Salt River [1]												
Arizona-California	Yuma	$5.00	$5.00	3, 4	3, 4							$1.00	$1.00
California	Orland	1.60	1.60	2½	2½							[2] .25, .50	[2] .25, .50
Colorado	Grand Valley	1.25	1.25	2½	2½							.75	.75
Idaho	Uncompahgre	1.15	1.15	3	3							.35	[3] .35, .40
	King Hill [4]	1.50	1.50	4	4							.35	.40
	Minidoka:												
	S. s. Pumping	1.50	2.25		2½	$0.40		$0.90					.30
	Gravity [5]												
	Boise	1.00	.85		3	.30		.40					.30
Montana	Huntley	1.50	1.50			.60	$0.60	1.10	$1.10				
	Milk River									$1.00	$1.00		
	Sun River:												
	Fort Shaw	1.10	1.15	1¼	1½							.50	.50
	Greenfields					.60	.60	1.00	1.00				
Montana-North Dakota	Lower Yellowstone [4]												
Nebraska-Wyoming	North Platte:												
	Interstate	2.00	2.00	3	3							.50	.50
	Fort Laramie [4]												
	Northport [4]												
Nevada	Newlands	2.00	2.00	2¼, 3, 4½	3, 4½							[6] .10–.80	[6] .10–.80
New Mexico	Carlsbad	1.50	1.50	2	2							.60	.50
New Mexico-Texas	Rio Grande [4]												
Oregon	Umatilla [4]												
Oregon-California	Klamath:												
	Main [4]												
	Tule Lake	1.65	1.85	2	2							[7] .50, .75	[7] .50, .75
South Dakota	Belle Fourche [4]												
Utah	Str. Valley	1.30	.70	2	2							.65	.35
Washington	Okanogan [4]												
	Yakima:												
	Sunnyside	2.00	1.80	3, 3½, 4½	3, 3½, 4½							1.00	1.00
	Tieton	2.00	2.00			.75	.75	1.20	1.50				
Wyoming	Riverton		1.00		2					.75			.50
	Shoshone:												
	Garland	1.05	1.25	2	2½							.45	.20
	Frannie									.55	.55		

[1] Operated by Salt River Valley Water Users' Association.
[2] First additional foot, $0.25; further quantities, $0.50.
[3] First additional foot, $0.35; further quantities, $0.40.
[4] Projects under contract with irrigation districts to pay actual cost of operation and maintenance.
[5] Operated by Minidoka irrigation district.
[6] First additional foot, $0.10; second additional foot, $0.20; third additional foot, $0.40; fourth additional foot, $0.80.
[7] First additional foot, $0.50; further quantities, $0.75.

zona, continues to lead in total returns with crops worth $3,660,000, closely followed by the Yakima project, Washington, producing from less than half as large an area crops estimated at $3,418,000.

The steady progress accomplished on the Huntley project, Montana, is brought out in the project manager's annual operation report. The reclamation extension act, accepted by practically all the water users, greatly improved their immediate financial condition. Additional buildings were erected and the population of project farms and towns showed a steady increase. By an overwhelming majority the water users voted for the construction of drainage works at a cost up to $15 per acre.

The year 1915 was the most favorable in the history of the Okanogan project, Washington. The principal obstacle to speedy success is the burden of indebtedness carried by the water users in the shape of farm mortgages at high interest rates. This burden, in effect a heavy charge for the raw land irrespective of the irrigation works, acts as a drain on the irrigators' resources, absorbing the returns that should be going to build up the farms, increasing the live stock, building, and farm equipment.

The Water Supply on the Projects

With the exception of Colorado, irrigation waters to be derived from snow will be below normal. Deficiencies in run-off will probably be most marked in the Pacific Northwest.

Light irrigation shortages are anticipated for the Milk River project, Montana, the Umatilla project, Oregon, and for the Truckee lands of the Newlands project, Nevada, although in the case of the last named, conditions are more favorable than at the end of April. A serious shortage now appears unavoidable on the Okanogan project, Washington.

All other reclamation projects are at this time assured of an ample supply of irrigation water.

The Colorado River may reach very low stages in late summer, owing to abnormal conditions in the Green River Basin in Wyoming, which may result in a deficient supply for the Imperial Valley of California. The Salt River project, Arizona, will be to a large extent dependent on its pumps or its water supply.

The Elephant Butte Dam, the principal engineering feature of the Rio Grande project, New Mexico-Texas, was completed Saturday afternoon, May 13, 1916, at 4 o'clock.

The water-users' association on the Sun River project is in consultation with the service regarding the organization and administration of irrigation districts with particular reference to taking over the maintenance and operation of the Fort Shaw unit.

The setting of the first bench mark on Yuma Mesa, the frostless citrus fruit land of the Yuma project, was the occasion of a simple ceremony on May 1, 1916. Col. B. F. Fly, who as representative of the valley, came to Washington and obtained approval of the reclamation commission for a survey of the first unit, is shown in the accompanying illustration placing the first shovel of dirt around the post.

COMPARATIVE COLLECTIONS: IS YOUR PROJECT SHOWING ANY IMPROVEMENT?

State	Project	Construction				Operation and maintenance			
		March, 1925	March, 1926	Fiscal year 1925, to Mar. 31, 1925	Fiscal year 1926, to Mar. 31, 1926	March, 1925	March, 1926	Fiscal year 1925, to Mar. 31, 1925	Fiscal year 1926, to Mar. 31, 1926
Arizona	Salt River			$599,326	$643,862				
Arizona-California	Yuma	$15,483	$12,212	343,318	334,179	$45,738	$37,828	$290,948	$216,332
California	Orland	9,077	5,213	28,540	76,321	2,582	1,358	24,994	32,857
Colorado	Grand Valley	(1)	(1)	(1)	(1)	5,408	7,392	32,281	43,812
	Uncompahgre	262	27,923	24,108	90,837	2,513	21,010	70,274	108,892
Idaho	King Hill							71	161
	Minidoka:								
	Gravity	2,748	14,833	58,425	101,031	12,639	11,651	12,639	11,651
	S. s. pumping	1,288	7,163	29,851	68,856	1,732	2,462	35,989	46,500
	Jackson Lake	324		31,970	39,982			9	111
	Boise	800	1,666	142,427	115,833	14,503	11,642	82,951	129,833
Montana	Huntley	366	1,175	16,895	21,514	724	2,263	25,771	28,611
	Milk River	(1)	(1)	(1)	(1)	1,099	3,693	13,563	14,205
	Sun River:								
	Fort Shaw	7	333	6,130	6,356	243	329	6,441	6,637
	Greenfields	(1)	(1)	(1)	(1)	219	333	10,732	12,637
Montana-North Dakota	Lower Yellowstone	724	33	3,350	10,549	2,595	88	5,221	10,604
Nebraska-Wyoming	North Platte:								
	Interstate	54	4,811	24,144	23,937	1,420	1,983	37,892	38,025
	Fort Laramie	(1)	(1)	(1)	(1)	2,535	60	29,603	33,166
	Storage	1,044		31,989	17,159	647	430	6,864	3,014
	Northport							22,748	23,381
Nevada	Newlands	2,833	3,060	33,028	48,593	8,180	8,801	79,034	107,956
New Mexico	Carlsbad	3,084	1,777	66,313	44,913	2,827	1,311	63,510	35,232
New Mexico-Texas	Rio Grande	147,051	93,200	180,901	211,394	153,264		201,763	72,683
North Dakota	Williston								
Oregon	Umatilla			5,730	257	104		17,579	7,900
Oregon-California	Klamath	1,387	235	59,684	32,089	176	440	49,334	36,454
South Dakota	Belle Fourche								
Utah	Strawberry Valley	462	11,000	62,866	91,620	329	353	23,944	29,913
Washington	Okanogan	847	4,382	1,068	4,605	3,103	19,177	3,998	29,184
	Yakima:								
	Sunnyside	4,580	64	49,993	108,123	28,454	14,623	42,737	71,019
	Tieton	12,693	15,427	107,216	151,105	8,005	11,113	70,098	72,724
	Storage	5,060	5,060	25,435	80,675	829	1,196	18,879	16,996
Wyoming	Shoshone:								
	Garland	266	1,873	8,465	23,739	1,107	2,409	12,389	34,032
	Frannie					40		486	
Total		210,440	211,440	1,941,172	2,347,529	301,015	161,945	1,292,742	1,274,522

[1] Projects on water-rental basis.

Organization Activities and Project Visitors

COMMISSIONER MEAD is planning for a western trip which will keep him in the field for two or more months, leaving Washington about the middle of June. Many of the newer developments will be visited by the commissioner, as well as those projects where more intensive settlement campaigns are in progress.

George C. Kreutzer, director of reclamation economics, left the Washington office early in May for a field trip of several months.

Dr. Ing. Y. Shen, of China, was a recent visitor on the Yuma project. Dr. Shen has just completed his education in Germany and is studying flood-control work in connection with the Yellow River in China.

Julian Hinds, engineer in the Denver office, was on the Orland project recently to inspect the Stony Gorge dam site and other features relating to the proposed supplemental construction. A geological examination of the dam site was made by C. D. Hulin, assistant professor of geology at the University of California.

C. C. Elder, engineer in the Denver office, has been investigating the water supply for the Dubois project.

W. Y. Cannon, manager of the Utah-Idaho Sugar Co., and C. D. Greenfield, agricultural and development agent of the Great Northern Railway, were recent visitors on the Milk River project.

F. J. Hanagan has been appointed treasurer and William H. Tuller assistant engineer for the board of control of the Boise project.

Ronald E. Rudolph, senior clerk on the Boise project, has been transferred to the Kittitas division of the Yakima project.

Miss Martha C. Hansen, clerk on the Boise project, has been transfered to the Minidoka project.

Vanford A. Anderson, clerk on the Boise project, has been transferred to the United States Veterans' Bureau at Boise.

Effective April 17, 1926, Maurice G. Ricker, editor of Motion Picture Films, has been placed in charge of the photographic laboratory of the Washington office of the Bureau of Reclamation. Mr. Ricker has been assigned to the Division of Settlement and Economic Operations, and will carry on his work and report to the commissioner through the chief of that division.

Delegates from the following projects have been in the Washington office recently in connection with affairs on their respective projects:

Uncompahgre.—C. J. Moynihan and William P. Dale.

Huntley.—Superintendent McGinness, J. Homer Hancock, and C. D. Howe.

North Platte.—James T. Whitehead; William Morrow.

Shoshone.—George W. Atkins.

United States Attorney Springmeyer United States Commissioner Anna M. Warren, District Counsel R. J. Coffey, Attorney Roy W. Stoddard for the irrigation districts, and Attorney George Sanford for the upstream water users, were in Fallon, Newlands project during April to take depositions from old Lahontan Valley residents in connection with the Carson River adjudication suit.

A. C. Cooley, agriculturist in charge of demonstrations on reclamation projects, visited the Newlands office recently to discuss project agricultural matters.

Mr. Strohm, of the Worthington Pump Co., was on the Klamath project in April making alterations and tests on the Dry Lake pumping plant.

Mr. Chase and Mr. Newson, Southern Pacific engineers, called at the Klamath project office recently in connection with the location of the proposed Modoc Northern across the Tule Lake division.

E. A. Inghan, respresentative of Clyde C. Kennedy, engineer of San Francisco, was in the Klamath project office during April to obtain hydrographic data in connection with a preliminary survey for a sewage system and disposal plant for Klamath Falls.

Recent visitors to the Strawberry Valley project included District Counsel J. R. Alexander, Inspector C. A. Lyman, and Messrs. A. C. Cooley and E. R. Price of the Department of Agriculture.

C. M. Day, mechanical engineer from the Denver office has completed the tests of the 60-inch balanced needle valves at Tieton Dam, Yakima project.

A. E. Koeher, of the Bureau of Soils, spent several days on the Kittitas division of the Yakima project reclassifying certain areas under the North Branch Canal.

Irrigating onions on the Rio Grande project, New Mexico-Texas

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 — P. W. Dent, Assistant to the Commissioner — C. A. Bissell, Chief of Engineering Division

W. F. Kuhach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. N. McCulloch, Chief Clerk

George C. Kreutzer, Director of Reclamation Economics

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, Acting 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. Walher	R. C. Walber	Wm. J. Burke	Mitchell, Nebr.
Boise [1]	Boise, Idaho	J. B. Bond				
Carlshad	Carlsbad, N. Mex.	L. E. Foster	W. C. Berger	W. C. Berger	Ottamar Hamele	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.	A. R. McGinness	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.	G. E. Stratton	E. E. Chabot	E. E. Chabot	do	Do.
Minidoka	Burley, Idabo	E. B. Darlington	G. C. Patterson	Miss A. J. Larson	B. E. Stoutemyer	Boise, Idabo.
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	H. L. Holgate	Portland, Oreg.
Orland	Orland, Calif.	R. C. E. Weber	C. H. Lillingston	C. H. Lillingston	R. J. Coffey	Berkeley, Calif.
Rio Grande	El Paso, Tex.	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	El Paso, Tex.
Riverton	Riverton, Wyo.	H. D. Comstock	R. B. Smith	V. E. Huhhell	Wm. J. Burke	Mitchell, Nehr.
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.
Strawherry Valley	Provo, Utah	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont.	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg.	H. M. Schilling	C. M. Voyen	C. M. Voyen	H. L. Holgate	Portland, Oreg.
Uncompahgre	Montrose, Colo.	L. J. Foster	G. H. Bolt	F. D. Helm	J. R. Alexander	Montrose, Colo.
Yakima	Yakima, Wash.	J. L. Lytel	R. K. Cunningham	J. C. Gawler	H. L. Holgate	Portland, Oreg.
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 [5]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Boise, Idaho.
North Platte, Guernsey Dam.	Guernsey, Wyo.	F. F. Smith [5]	Chas. Klingman	L. J. Windle	Wm. J. Burke	Mitchell, Nehr.
Umatilla, McKay Dam.	McKay Dam, Oreg.	R. M. Conner [6] Ralpb Lowry [5]	C. B. Funk	W. S. Gillogly	H. L. Holgate	Portland, Oreg.
Kittitas	Ellensburg, Wasb.	Walker R. Young [6]	E. R. Mills		H. L. Holgate	Portland, Oreg.

[1] Project operated by Nampa-Meridian, Boise-Kuna and Wilder irrigation districts.
[2] Project operated hy 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
Sacramento Valley	Ellensburg, Wash.	Walker R. Young	Sacramento Valley Development Association and State of California.
Duhois	American Falls, Idaho	F. A Banks	Dubois Project Finance Association.
Milk River eastern trihutaries	Hermiston, Oreg.	E. R. Crocker	
Spanish Springs storage	Fernley, Nev.	A. W. Walker	
Harney Valley	Boise, Idaho	R. J. Newell	
Owyhee	do	do	
Vale	do	do	
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo.	F. F. Smith	State of Wyoming.

The NEW RECLAMATION ERA is sent montbly to all water users on the reclamation projects under tbe jurisdiction of the bureau wbo wisb to receive the magazine. To others tbe subscription price is 75 cents a year, payahle in advance hy check or money order drawn in favor of the Special Fiscal Agent, Bureau of Reclamation.

FIRST IRRIGATION ON DESERT LAND

BORDER METHOD OF IRRIGATION

IRRIGATING POTATOES

IRRIGATING AN ORANGE GROVE

A CONCRETE LINED IRRIGATION CANAL

FURROW METHOD OF IRRIGATION

IRRIGATION SCENES ON THE RECLAMATION PROJECTS

I 27.5:1926

NEW RECLAMATION ERA

Clemson Agricultural College of South Carolina Library

VOL. 17 JULY, 1926 NO. 7

IMMENSE QUANTITIES OF TOMATOES ARE GROWN FOR CANNING ON THE IRRIGATION PROJECTS OF THE BUREAU OF RECLAMATION

AS a result of the final enactment of the Omnibus Reclamation Adjustment Law, Federal irrigation projects will be shrunken to include only fertile lands capable of producing crops, according to a statement made recently by Secretary Work of the Interior Department.

"At the present time," stated Secretary Work, "many of the projects comprise thousands of acres of lands that are infertile, nonirrigable, seeped or otherwise unproductive. The effect of this new law will be to eliminate these lands from the projects entirely and retain only such areas as are capable of bearing their proportionate share of construction charges levied against them.

"This means that the farmers on the projects will not have to pay the construction costs of canals and works built to irrigate these unproductive lands. With the shrinkage of the projects these costs will be charged off as a loss to the Government, and the farmers will be relieved of paying them.

"Enactment of this law resulted from a comprehensive study of Federal reclamation started two years ago. A Fact Finders' Commission was appointed which after months of investigation made definite recommendations. A Board of Survey and Adjustments was then constituted that went over the projects classifying the lands in accordance with their productivity and recommending that the Government charge off construction costs against nonirrigable lands. With this final reappraisal and adjustment of reclamation, farmers should now be able to proceed with the successful development of their farms and ultimately own their own homes."

NEW RECLAMATION ERA

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HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 17 JULY, 1926 No. 7

Interesting High Lights on the Reclamation Projects

THE Yuma project shipped 251 carloads of agricultural products during the month valued at $76,350. The total value of the 1,475 carloads of such shipments since the first of the year amounts to $1,350,000.

APRICOTS on the Orland project were beginning to ripen and a large yield with remunerative prices is anticipated. The bulk of the crop will be shipped to a Sacramento plant at a price of $65 a ton, f. o. b. cars at Orland.

THE Mesa County Irrigation District, Grand Valley project, paid on the due date of June 1 the semiannual installment of $2,450 as required by their contract. The Palisade Irrigation District also met their obligations on the same date. The latter district has never yet been delinquent 24 hours in their payments to the Government.

THE development of Orchard Mesa, Grand Valley project, has continued with a considerable increase in cultivated area and a noticeable improvement in the construction of buildings and fences. Approximately 5,000 acres of this land is being farmed, which is an increase of 100 per cent over the area in 1921. The farmers in this district are very optimistic over their prospects, and the development of the remaining area should be rapid.

THE first shipment of eggs by the newly organized Churchill County Poultrymen (Inc.), Newlands project, left Fallon recently for Los Angeles when 24 local farmers joined in a trial to determine returns from outside markets. Heretofore shipments to outside points have been made by express to San Francisco at approximately 3½ cents per dozen. The refrigerator freight plan offers a lower rate of 2½ cents per dozen to the more distant markets.

LAHONTAN Reservoir, Newlands project, although lowering quite rapidly under heavy draft, small inflow, and warm weather conditions, still contains enough storage to supply the Carson division without possibility of shortage.

ON MARCH 1 on the Uncompahgre project 1,028 delinquent accounts were mailed from the project office. The response to these notices has been very gratifying, and at the end of June 922 delinquent accounts had been cleared for water for the irrigation season by payment of the charges due.

THE American Falls reservoir, by tiding over the period while the river was extremely low and storage was still in progress at Jackson Lake, and also by making it possible to maintain satisfactory power heads at Lake Walcott, was of inestimable service to lower valley water users.

A CREAM pool for the Minidoka project has been organized under the name of the Mini-Cassia Dairymen's Association, with headquarters at Burley, Idaho. About 1,600 cows have been signed up for the pool.

GOOD progress continues to be made by the Utah Construction Co. on the construction of American Falls Dam. Approximately 25,000 cubic yards of concrete were poured during the month. Storage in the reservoir began to be released on May 1 at which time 112,500 acre-feet were stored.

WORK on lining the spillway channel at McKay Dam, Umatilla project, has been carried on without interruption, and work has been continued on placing the concrete paving on the upstream face of the dam. The average thickness of the concrete poured was about 10 inches.

GRASSHOPPERS have been giving serious trouble on the Tule Lake leased lands, Klamath project, and about 400 acres of grain were destroyed. Poisoned grain and a grasshopper burner have been used to control the pests.

THE Belle Fourche project received considerable publicity through the "Sugar Beet Special" which the Great Northern sent over the project recently. The demonstrations and talks on beet agriculture attracted large crowds at Belle Fourche and Nisland and indicated a widespread interest in this crop.

A check for $40,000 was received recently by the bureau from the Belle Fourche irrigation district to cover required operation and maintenance payment, and at the close of the month the total collections for this feature, including credits, amounted to $55,000.

THE delinquent list on the Tieton division of the Yakima project at the close of May was the smallest for a number of years, and the acreage entitled to and receiving water, either by the payment of charges or through the acceptance of notes and mortgages, for regular use and for transfer purposes, will probably run higher than the 1922 maximum of 31,150 acres.

DURING May five additional applications were received for farms on the Riverton project. Three of these were from ex-service men. All of the applicants live at a considerable distance from the project and none has yet appeared for examination as to settlement qualifications.

DIAMOND drill explorations have been in progress at Gibson Dam site, Sun River project. At the end of May eight holes, with a total of 508 linear feet 10 inches, had been completed.

103011—26——1

The Omnibus Bill as Passed and Approved by the President

The approval of this bill on May 25, 1926, provides for the definite write-off of charges amounting to $14,667,965 and the suspension of charges amounting to $12,788,406

BE it enacted by the Senate and House of Representative of the United States of America in Congress assembled, That the Secretary of the Interior be, and he is hereby, empowered and directed to make, under subsection K, section 4, Act of December 5, 1924 (Forty-third Statutes at Large, page 701), in connection with the irrigation projects hereinafter named, adjustment of water-right charges standing upon the records of said projects as of June 30, 1925, as follows:

BELLE FOURCHE PROJECT, SOUTH DAKOTA

SEC. 2. There shall be deducted from the total cost of said project the following sums:

(1) $355,809, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) One thousand two hundred and eight acres permanently unproductive because of topography steep and rough heretofore eliminated;

(b) Six thousand eight hundred and ninety-seven acres permanently unproductive because of topography steep and rough; based on present land classification.

(2) $119,606 on account of operation and maintenance deficit prior to reclamation extension Act of 1914.

(3) $12,036 on account of error or mistake representing Johnson Creek lateral storage investigations and Nine Mile location surveys as shown on page 14 of House Document Numbered 201, Sixty-ninth Congress, first session.

SEC. 3. All payments upon construction charges shall be suspended against the following lands:

(a) Ten thousand five hundred acres temporarily unproductive for lack of fertility in the soil, seepage, and excessive alkali salts;

(b) Six thousand eight hundred and ninety-five acres, Willow Creek lands awaiting further developments, temporarily unproductive;

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown in the table on page 14 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

BOISE PROJECT, IDAHO

SEC. 4. All payments upon construction charges shall be suspended against the following lands:

(a) Two thousand nine hundred and ninety acres, Arrowrock division, temporarily unproductive for lack of fertility in the soil and being water-logged;

(b) Four hundred and eight acres, Arrowrock division, Nampa and Meridian district, temporarily unproductive for lack of fertility in the soil, being water-logged;

(c) Two thousand six hundred and fifty acres, Arrowrock division, temporarily unproductive because of light, sandy soil that blows easily;

(d) Three hundred and eighty-eight acres, Arrowrock division, temporarily unproductive because of porous soil difficult to irrigate.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 15 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

CARLSBAD PROJECT, NEW MEXICO

SEC. 5. There shall be deducted from the total cost of the said project the sum of $374,885.69, on account of error and mistake in providing for additional storage in Lake McMillan reservoir as follows:

(1) Acquisition of flowage rights required for additional storage, rights of way, and expenses incidental thereto, $164,383.62.

(2) For additional and incidental construction required for said additional storage, $210,502.07, as follows:

(a) Preliminary surveys, and so forth, $6, 718.62.

(b) Extra dam construction, $89,153.13.

(c) Holes in reservoir bottom, $2,379.52.

(d) Spillway numbered 1, $49,549.80.

(e) Spillway numbered 2, $62,701.

SEC. 6. All payments upon construction charges shall be suspended against the following lands: One thousand and five acres temporarily unproductive for lack of fertility in the soil because of seepage and alkalinity; all as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 17 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

GRAND VALLEY PROJECT, COLORADO

SEC. 7. There shall be deducted from the total cost of said project the following sums:

$760,628, or such an amount as represents the construction costs as found by the Secretary of the Interior against the following lands:

(a) Nine thousand one hundred and seven acres permanently unproductive for lack of fertility in the soil, shallow soil, alkalinity, and unfavorable topography;

(b) One thousand six hundred and fifty acres, West End Extension, permanently unproductive because of unfavorable topography, shallow soil, and alkalinity.

SEC. 8. When construction charges are announced for the productive lands of the project all payments of construction charges shall be suspended against the following lands:

(a) Seven thousand one hundred and fifty acres temporarily unproductive for lack of fertility in the soil, seepage, and alkalinity;

(b) Eleven thousand eight hundred and sixty-three acres of productive lands temporarily unproductive because no construction thus far of the Garfield pumping division, or of the Loma siphon land extension, or any other means of reclaiming the same, and there being no present demand for these unirrigated lands.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown in the table on page 19 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, said document.

HUNTLEY PROJECT, MONTANA

SEC. 9. There shall be deducted from the total cost of said project the following sums:

(1) $46,987, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Four hundred and four acres, Pryor division, permanently unproductive because eroded and marginal to the river;

(b) Four hundred and twenty-seven acres, Eastern and Fly Creek divisions, permanently unproductive for lack of fertility in the soil. .

(2) $81,354 on account of operation and maintenance deficit prior to reclamation extension Act of 1914.

The Secretary is further directed to assume as a definite loss such sums as in his judgment may be just and proper in connection with moneys expended for experiments with reclamation on alkali lands, and costs in excess of contracted returns, such total not to exceed $41,000.

SEC. 10. All payments upon construction charges shall be suspended against the following lands:

(a) Eleven thousand one hundred and seventy acres, Pryor division, temporarily unproductive, being gumbo and alkali soil;

(b) One thousand three hundred and thirty-six acres, Pryor division, temporarily unproductive, being private lands unpledged;

(c) Nine hundred and seventy acres, Eastern and Fly Creek divisions, temporarily unproductive, seeped.

All as shown by classification heretofore made under the supervision of the Board of Survey and adjustments and as shown in the table on page 21 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

KING HILL PROJECT, IDAHO

SEC. 11. There shall be deducted from the total cost of said project the following sum:

(1) $531,958, or such amounts as represent actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Seven hundred and ten acres permanently unproductive, being not susceptible of improvement because of lack of fertility in the soil;

(b) Three thousand seven hundred and sixty-four acres on account of inadequate

water supply, porous soil, and gravelly subsoil.

SEC. 12. All payments upon construction charges shall be suspended against the following lands:

(a) One thousand eight hundred and ninety-eight acres, on account of probably insufficient water supply, porous soil and sandy and porous subsoil;

(b) Five hundred and sixteen acres included in town sites and suspended areas.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 23 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

KLAMATH PROJECT, OREGON

SEC. 13. There shall be deducted from the total cost of said project the following sum:

(1) $1,587, or such amounts as may be actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Thirty-eight acres main divisions, Klamath irrigation district, permanently unproductive for lack of fertility in the soil.

SEC. 14. All payments upon construction charges shall be suspended against the following lands:

(a) Five hundred and seventeen acres, main division, Klamath irrigation district, temporarily unproductive for lack of fertility in the soil;

(b) One hundred and twenty-nine acres, Horsefly irrigation district, temporarily unproductive for lack of fertility in the soil;

(c) Eighty-three acres, Langell Valley irrigation district temporarily unproductive for lack of fertility in the soil.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments, as shown in the table on page 27 of said Document 201, as checked and modified as recommended in "General recommendations" numbered 2 and 4, page 60, of said Document 201.

SEC. 15. The Secretary is further authorized and directed when announcement is made of the construction charges for the Tule Lake division of this project to take into consideration the recommendation of the board on page 26 of said Document 201, that a loss to the reclamation fund will ultimately ensue on this division and also a probable loss of $34,000 from lands of the Horsefly irrigation district by reason of the construction of the Gerber Reservoir, and he is further authorized and directed to deduct from the cost of said division the sum of $234,407 as recommended by the Board of Survey and Adjustments on page 26 of said document, and to fix and allocate the construction cost per acre in accordance with the findings and recommendations of the said board on page 26 of said document. The construction charge against the area in this division now under contract shall also be adjusted accordingly: *Provided*, That the construction charges shall in no event exceed a just and equitable charge against the Tule Lake division based on the value of water for irrigation under the economic conditions prevailing, notwithstanding such charges may not return the full cost of construction.

SEC. 16. Nothing in this Act shall be held to affect or prejudice the claims of the Klamath Irrigation District or the State of Oregon in any suit or action now or hereafter instituted to set aside that certain contract between the United States and the California-Oregon Power Company, dated February 24, 1917, together with all contracts or modifications thereof, and to set aside or cancel the sale made by the United States of the so-called Ankeny and Keno Canals and the lands embraced in the rights of way thereof in the year 1923 to the said California-Oregon Power Company.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

SEC. 17. There shall be deducted from the total cost of said project the following sum:

(1) $382,254, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Five hundred and seventy-four acres permanently unproductive on account of right of way of the Great Northern Railway.

(b) Seven hundred and eighty-eight acres permanently unproductive, embracing town sites.

(c) Six thousand and seventy-seven acres on account of error in original estimate of irrigable area.

SEC. 18. All payments upon construction charges shall be suspended against the following lands:

(a) Five hundred acres temporarily unproductive because of damage by erosion;

(b) Two thousand eight hundred acres temporarily unproductive because waterlogged;

(c) Seven thousand one hundred and eighty-eight acres temporarily unproductive because of forest covering and rough topography;

(d) Three hundred and thirteen acres temporarily unproductive because located in United States reserves.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 28 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

MILK RIVER PROJECT, MONTANA

SEC. 19. There shall be deducted from the total cost of said project the following sums:

(1) $100,978, or such an amount as represents the construction costs as found by the Secretary of the Interior against the following lands:

(a) One thousand seven hundred and seventy acres permanently unproductive for lack of fertility in the soil.

(2) $145,054 on account of error or mistake, representing unused Saint Mary East Canal and measuring Saint Mary waters as shown on page 31 of said Document 201.

(3) $929,212, major work unused as shown on page 31 of said Document Numbered 201.

(4) $735,945, major and minor works unused as shown on page 31 of said Document Numbered 201.

SEC. 20. When the construction charges are announced for the productive lands of the project all payments of construction charges shall be suspended against the following lands:

(a) Twenty-three thousand five hundred acres temporarily unproductive for lack of fertility in the soil;

(b) Nine thousand four hundred and thirty acres temporarily unproductive because of inadequate storage and refractory soils.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown in the table on page 31 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

MINIDOKA PROJECT, IDAHO

SEC. 21. There shall be deducted from the total cost of said project the following sum:

(1) $9,172, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) One hundred and seventy-eight acres, Gravity division, permanently unproductive for lack of fertility in the soil;

(b) Thirty-eight acres, South Side Pumping division, permanently unproductive for lack of fertility in the soil and impregnated with alkali.

SEC. 22. All payments upon construction charges shall be suspended against the following lands:

(a) One thousand six hundred and thirty-four acres, Gravity division, temporarily unproductive because waterlogged and for lack of fertility in the soil;

(b) Nine hundred and twenty acres, Gravity division, temporarily unproductive because of inadequate water supply and of porous soil;

(c) Five hundred and twenty-five acres, Gravity division, temporarily unproductive because of "blow soil";

(d) One hundred and ninety-seven acres, South Side Pumping division, temporarily unproductive for lack of fertility in the soil and because water-logged.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 33 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, of said document.

NEWLANDS PROJECT, NEVADA

SEC. 23. There shall be deducted from the total cost of said project the following sums:

(1) $3,315,136, or such amount as represents actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Four hundred and four acres permanently unproductive for lack of fertility in the soil;

(b) Fifty thousand acres on account of inadequate water supply; major works unused;

(c) Thirty-two thousand five hundred and eighty-two acres on account of inadequate water supply; major and minor works unused.

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(2) $139,687 for operation and maintenance deficit prior to Reclamation Extension Act of 1914;

(3) $82,221, Truckee River water-right adjudication;

(4) $71,605 expense pumping at Lake Tahoe and Truckee Canals, less amount recovered from sale of power;

(5) $155,465 on account of error or mistake covering various items due chiefly to lesser irrigable area than contemplated;

(6) $884,998 on account of error or mistake, being aggregate shortage of returns because of low acre charges in the early contracts, allowing also for surcharge on nine hundred and thirty-four acres of land.

SEC. 24. All payments upon construction charges shall be suspended against the following lands:

(a) Four thousand four hundred and fourteen acres temporarily unproductive for lack of fertility in the soil;

(b) Ten thousand six hundred and ninety-four acres public and private lands uncontracted at present.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 37 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, of said document.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

SEC. 25. There shall be deducted from the total cost of said project the following sums:

INTERSTATE DIVISION

(1) $36,250, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Five hundred and thirty-two acres permanently unproductive for lack of fertility in the soil.

(2) $23,751.59 on account of error or mistake in charging the cost of secondary investigations to this division.

FORT LARAMIE DIVISION

(1) $22,680 on account of error or mistake in charging the cost of secondary investigations to this division.

NORTHPORT DIVISION

(1) $3,425 on account of error or mistake in charging the cost of secondary investigations to this division.

SEC. 26. All payments upon construction charges shall be suspended against the following lands:

INTERSTATE DIVISION

(a) Twenty-five thousand three hundred and ninety-nine acres temporarily unproductive for lack of fertility in the soil, being partly seeped and partly blow sand;

(b) Five hundred and fifteen acres temporarily unproductive, being unclassified land.

FORT LARAMIE DIVISION

(a) Seven thousand six hundred and sixty-five acres temporarily unproductive for lack of fertility in the soil.

NORTHPORT DIVISION

(a) Two thousand five hundred and fifty-five acres temporarily unproductive for lack of fertility in the soil.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the tables on pages 39 and 40 of said Document 201, as revised and as checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

OKANOGAN PROJECT, WASHINGTON

SEC. 27. There shall be deducted from the total cost of said project the following sums:

(1) $227,783, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Two thousand three hundred and fifty-four acres permanently unproductive on account of sandy soil;

(b) Six acres, Duck Lake feeder canal right of way, permanently unproductive on account of other physical causes.

(2) $492,917 on account of error or mistake in charging the cost of examination, surveys, construction, and purchase in connection with the following items: Colville extension, power plants numbered 1 and 2, Salmon Lake Reservoir, power plant numbered 3, transmission line, pumping plant at Riverside, and sandy land water rights.

SEC. 28. All payments upon construction charges shall be suspended against the following lands:

(a) Fifty-seven acres, temporarily unproductive because of sandy soil;

(b) Twenty-nine acres temporarily unproductive because of seepage.

SEC. 29. The sum of $89,708.22, representing the total cost of works described below, shall be suspended and treated as a probable loss until the question of a permanent project water supply is settled, and if such works are then abandoned the Secretary of the Interior is authorized to deduct the sum named from the total cost of the project. The works are (1) Robinson Flat pumping plant, (2) Duck Lake pumping plant, (3) Salmon Lake pumping plant, (4) Government wells numbered 1 and 2, and (5) private wells and pumping plant.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments, as shown in the tables on page 42 of said Document 201, subject to checking and modification as recommended in "General recommendations" numbered 2 and 4, on page 60 of said document.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

SEC. 30. There shall be deducted from the total cost of said project the following sum:

(a) $31,661.35 on account of error or mistake in charging the costs of the following items against said project: Operation and maintenance deficit (El Paso County water improvement district numbered 1); Farm unit survey, Leasburg division (Elephant Butte irrigation district), 50 per centum of $14,530; Palomas Valley, farm unit survey; Palomas Valley, canal survey; Palomas Valley, flood protection and drainage; Palomas Valley, percentage cost of general investigations charged; San Luis Valley, drainage investigations.

All as shown in the table on page 45 of said Document 201 as revised and subject to checking and modification as recommended in "General recommendations" on pages 60 and 61 of said document.

(b) The Secretary of the Interior is hereby authorized to credit on the contract dated January 17, 1920, as supplemented by contract of October 12, 1922, between the United States and the El Paso County Water Improvement District Number 1, the sum of $350,000 or such portion thereof as in the opinion of the Secretary of the Interior may be necessary and is actually expended in the investigation and construction of necessary works to be built at the expense of said district as a part of the Rio Grande project for the protection of its water supply encroached upon by diversions made from the Rio Grande for use in Mexico. The amounts expended by said district shall be credited upon the said contracts of January 17, 1920, and October 12, 1922, between the United States and the district to the extent of construction charges payable annually by the district to the United States under the contracts mentioned, the first credit to be applied in the year in which the funds, or a portion thereof, within above limitation, are expended. Thereafter such credits shall continue until all cost so incurred by the district shall have been absorbed. During the years credits are so applied no payments shall be required on the part of said district under its contracts mentioned. The total indebtedness under said contracts shall be reduced to the extent of expenditures made hereunder.

SHOSHONE PROJECT, WYOMING-MONTANA

SEC. 31. There shall be deducted from the total cost of said project the following sums:

(1) $1,677,630, or such amount as represents actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Four thousand and eleven acres, Garland division, permanently unproductive for lack of fertility in the soil;

(b) Eighteen thousand three hundred and twenty-four acres, Frannie division, permanently unproductive for lack of fertility in the soil.

(2) (a) $21,373 on account of operation and maintenance deficit prior to reclamation extension Act of 1914 (Garland division).

(b) $16,663 on account of operation and maintenance deficit prior to reclamation extension Act of 1914 (Frannie division).

SEC. 32. All payments upon construction charges shall be suspended against the following lands:

(a) Three thousand seven hundred and nine acres, Garland division, temporarily unproductive for lack of fertility in the soil;

(b) Three thousand three hundred and fifty-three acres, Frannie division, temporarily unproductive for lack of fertility in the soil.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 47 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, of said document.

(c) Five hundred and twenty-four acres on account of having been abandoned.

SUN RIVER PROJECT, MONTANA

SEC. 33. There shall be deducted from the total cost of said project the following sums:

(1) $79,649, or such amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Nine hundred and sixty-two acres, Fort Shaw division, permanently unproductive for lack of fertility in the soil, nonirrigable and nonarable;

(b) One hundred and five acres, Fort Shaw division, permanently unproductive because inaccessible by erosion and floods;

(c) One thousand two hundred and thirty-three acres, Fort Shaw division, permanently unproductive because flooded and eroded.

(2) $11,734 because of error or mistake on account of adjustment losses.

(3) $34,148, Operation and Maintenance deficit prior to the Reclamation Extension Act of 1914.

SEC. 34. All payments upon construction charges shall be suspended against the following lands:

(a) Two thousand five hundred and eighteen acres, Fort Shaw division, temporarily unproductive, subscribed; waterlogged;

(b) One thousand two hundred and ninety-two acres, Fort Shaw division, temporarily unproductive, unentered, and unsubscribed.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and as shown in the table on page 49 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60, of said document.

UMATILLA PROJECT, OREGON

SEC. 35. There shall be deducted from the total cost of said project the following sums:

EAST DIVISION

(1) $490,390, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Two thousand five hundred and seventy-five acres permanently unproductive for lack of fertility in the soil, not susceptible of improvement;

(b) Two thousand two hundred and fifty-five acres permanently unproductive because of porous soil, gravelly subsoil.

(2) $388,448 on account of error or mistake—excluded from district repayments on account of faulty construction.

(3) $16,711 on account of error or mistake; loss on Hermiston district lands.

(4) $91,083 on account of operation and maintenance deficit prior to Reclamation Extension Act of 1914.

WEST DIVISION

(1) $5,703, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Fifty-nine acres permanently unproductive for lack of fertility in the soil, not susceptible of improvement.

(2) $252 on account of error or mistake representing shortage of contracted returns from fifty-four acres under water-right applications.

(3) The water-rights formerly appurtenant to all permanently unproductive lands on the Umatilla project shall be available to the remaining lands without added cost to the water users.

SEC. 36. All payments upon construction charges shall be suspended against the following lands:

EAST DIVISION

(a) Six hundred and ten acres temporarily unproductive for lack of fertility in the soil because of water-logging;

(b) Five hundred and thirty acres representing in amount $37,100 and described as probable loss on Hermiston district lands.

WEST DIVISION

(a) Three thousand four hundred and twenty-two acres temporarily unproductive because of inadequate water supply;

(b) Five hundred and ninety-five acres temporarily unproductive because of water-logging.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments, as shown in the tables on page 52 of said Document 201, as revised and as checked and modified as recommended in "General recommendations" numbered 2 and 4, on page 60 of said document.

UNCOMPAHGRE PROJECT, COLORADO

SEC. 37. There shall be deducted from the total cost of the said project the following sums:

(1) $1,318,056, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

(a) Four hundred and thirty-nine acres permanently unproductive for lack of fertility in the soil;

(b) Twenty-four thousand nine hundred and eighteen acres permanently unproductive because of an inadequate water supply.

(2) $47,371 on account of error or mistake representing deductions recommended and covered in contract of May 7, 1918, between the United States and the Uncompahgre Valley Water Users' Association. The total thus to be deducted from the project cost shall be charged off as a permanent loss to the reclamation fund.

SEC. 38. All payments upon construction charges shall be suspended against the following lands:

(a) Seventeen thousand acres temporarily unproductive because water-logged;

(b) Five thousand six hundred and twenty-nine acres temporarily unproductive because of rolling and uneven topography;

(c) Five thousand acres temporarily unproductive because of alkalinity;

(d) The water rights formerly appurtenant to the permanently unproductive lands shall be available to the remaining land on said project without added cost to the water users, because of the Gunnison Tunnel not yet being completed and there being an inadequate water supply.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown in the table on page 55 of said Document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

YAKIMA PROJECT, WASHINGTON

SEC. 39. There shall be deducted from the total cost of said project the following sum:

$3,068, or such an amount as represents the actual construction charges as found by the Secretary of the Interior against the following lands:

Fifty-nine acres, Sunnyside division, permanently unproductive because of shallow soil overlying rock.

SEC. 40. All payments upon construction charges shall be suspended against the following lands:

(a) One thousand eight hundred and forty-nine acres, Sunnyside division, temporarily unproductive, being either waterlogged, alkalied, rough, steep, shallow soil overlying hardpan, or difficult to subdue.

(b) Three thousand and thirty-two acres, Tieton division, temporarily unproductive because of shallow, poor soil with rough topography.

All as shown by classification heretofore made under the supervision of the Board of Survey and Adjustments and shown on page 57 of said document 201, checked and modified as outlined in "General recommendations" numbered 2 and 4, page 60 of said document.

ADMINISTRATIVE PROVISIONS

SEC. 41. All lands found by the classification to be permanently unproductive shall be excluded from the project and no water shall be delivered to them after the date of such exclusion unless and until they are restored to the project. Except as herein otherwise provided, the water right formerly appurtenant to such permanently unproductive lands shall be disposed of by the United States under the reclamation law: *Provided*, That the water users on the projects shall have a preference right to the use of the water: *And provided further*, That any surplus water temporarily available may be furnished upon a rental basis for use on lands excluded from the project under this section, on terms and conditions to be approved by the Secretary of the Interior.

SEC. 42. The construction charges heretofore paid on permanently unproductive lands excluded from the project shall be applied as a credit on charges due or

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to become due on any remaining irrigable land covered by the same water-right contract or land taken in exchange as provided in section 44 of this Act. If the charges so paid exceed the amount of all water-right charges due and unpaid, plus the construction charges not yet due the balance shall be paid in cash to the holder of the water-right contract covering the land so excluded or to the irrigation district affected; which in turn shall be charged with the responsibility of making suitable adjustment with the landowners involved. Should all the irrigable lands of a water-right applicant be excluded from the project as permanently unproductive, and no exchange be made as provided in section 44 hereof, the total construction charges heretofore paid, less any accrued charges on account of operation and maintenance, shall be refunded in cash, the water-right contract shall be canceled, and all liens on account of water-right charges shall be released.

SEC. 43. The payment of all construction charges against said areas temporarily unproductive shall remain suspended until the Secretary of the Interior shall declare them to be possessed of sufficient productive power properly to be placed in a paying class, whereupon payment of construction charges against such areas shall be resumed or shall begin as the case may be. While said lands are so classified as temporarily unproductive and the construction charges against them are suspended, water for irrigation purposes may be furnished upon payment of the usual operation and maintenance charges, or such other charges as may be fixed by the Secretary of the Interior the advance payment of which may be required, in the discretion of the said Secretary. Should said lands temporarily classed as unproductive, or any of them, in the future be found by the Secretary of the Interior to be permanently unproductive, the charges against them shall be charged off as a permanent loss to the reclamation fund and they shall thereupon be treated in the same manner as other permanently unproductive lands as provided in this Act.

SEC. 44. Settlers who have unpatented entries under any of the public land laws embracing lands which have been eliminated from the project, or whose entries under water rights have been so reduced that the remaining area is insufficient to support a family, shall be entitled to exchange their entries for other public lands within the same project or any other existing Federal reclamation project, with credit under the homestead laws for residence, improvement, and cultivation made or performed by them upon their original entries and with credit upon the new entry for any construction charges paid upon or in connection with the original entry: *Provided*, That when satisfactory final proof has been made on the original entry it shall not be necessary to submit final proof upon the lieu entry. Any entryman whose entry or farm unit is reduced by the elimination of permanently unproductive land shall be entitled to enter an equal amount of available public land on the same project contiguous to or in the vicinity of the farm unit reduced by elimination, with all credits in this section hereinbefore specified in lieu of the lands eliminated. Owners of private lands so eliminated from the project may, subject to the approval of the Secretary of the Interior, and free from all encumbrances, relinquish and convey to the United States lands so owned and held by them, not exceeding an area of one hundred and sixty acres, and select an equal area of vacant public land within the irrigable area of the same or any other Federal reclamation project, with credit upon the construction costs of the lands selected to the extent and in the amount paid upon or in connection with their relinquished lands, and the Secretary of the Interior is hereby authorized to revise and consolidate farm units, so far as this may be made necessary or advisable, with a view to carrying out the provisions of this section: *Provided further*, That the rights extended under this section shall not be assignable: *And provided further*, That in administering the provisions of this section and section 42, the Secretary of the Interior shall take into consideration the rights and interests of lien holders as to him may seem just and equitable: *Provided further*, That where two entrymen apply for the same farm unit under the exchange provisions of this section, only one of whom is an ex-service man, as defined by the joint resolution of January 21, 1922 (Forty-second Statutes, page 358), the ex-service man shall have a preference in making such exchange.

SEC. 45. The Secretary of the Interior is hereby authorized, in his discretion, to amend any existing water-right contract to the extent necessary to carry out the provisions of this Act, upon request of the holder of such contract. The Secretary of the Interior, as a condition precedent to the amendment of any existing water-right contract, shall require the execution of a contract by a water-users' association or irrigation district whereby such association or irrigation district shall be required to pay to the United States, without regard to default in the payment of charges against any individual farm unit or tract of irrigable land, the entire charges against all productive lands remaining in the project after the permanently unproductive lands shall have been eliminated and the charges against temporarily unproductive areas shall have been suspended in the manner and to the extent authorized and directed by this Act.

The Secretary is authorized, in his discretion, upon request of individual water users or districts, and upon performance of the condition precedent above set forth, to amend any existing water-right contract to provide for increase in the time for payment of construction charges, which have not then accrued, to the extent that may be necessary under the conditions in each case, subject to the limitation that there shall be allowed for repayment not more than forty years from the date the first payment matured under the original contract, and also to extend the time for payment of operation and maintenance or water rental charges due and unpaid for such period as in his judgment may be necessary not exceeding five years, the charges so extended to bear interest payable annually at the rate of 6 per centum per annum until paid, and to contract for the payment of the construction charges then due and unpaid within such term of years as the Secretary may find to be necessary, with interest payable annually at the rate of 6 per centum per annum until paid.

The Secretary is further authorized, in his discretion, to grant the relief provided for in section 4, Act of December 5, 1924 (Forty-third Statutes at Large, page 701), to any of the projects mentioned in this Act, without requiring such project to take over the care, operation, and maintenance of the project works.

The decision of the Secretary as to the necessity for amending any such contract shall be conclusive: *Provided*, That nothing in this Act shall prevent the execution of any contract heretofore negotiated or in connection with which negotiations have been heretofore opened in good faith or which may be hereafter opened in good faith under the Act approved December 5, 1924 (Forty-third Statutes at Large, page 701), and which shall be executed on or before January 1, 1927, unless the water users affected elect to have the contract governed by this section: *Provided further*, That in the execution of any contract provided for in the last proviso, the Secretary of the Interior shall have authority to arrange for payment of construction charges by any project or division for the calendar years 1926, 1927, and 1928 in proportion to the state of development of the project in those years: *Provided further*, That the Secretary of the Interior is authorized to complete and execute the supplemental contract, now being negotiated and which has been approved as to form by the Secretary, between the United States and the Belle Fourche Irrigation District and at the expiration of said supplemental contract to enter into a permanent contract on behalf of the United States with said District in accordance with the terms of said supplemental contract.

SEC. 46. No water shall be delivered upon the completion of any new project or new division of a project until a contract or contracts in form approved by the Secretary of the Interior shall have been made with an irrigation district or irrigation districts organized under State law providing for payment by the district or districts of the cost of constructing, operating, and maintaining the works during the time they are in control of the United States, such cost of constructing to be repaid within such terms of years as the Secretary may find to be necessary, in any event not more than forty years from the date of public notice hereinafter referred to, and the execution of said contract or contracts shall have been confirmed by a decree of a court of competent jurisdiction. Prior to or in connection with the settlement and development of each of these projects, the Secretary of the Interior is authorized in his discretion to enter into agreement with the proper authorities of the State or States wherein said projects or divisions are located whereby such State or States shall cooperate with the United States in promoting the settlement of the projects or divisions after completion and in the securing and selecting of settlers. Such contract or contracts with irrigation districts herein-

before referred to shall further provide that all irrigable land held in private ownership by any one owner in excess of one hundred and sixty irrigable acres shall be appraised in a manner to be prescribed by the Secretary of the Interior and the sale prices thereof fixed by the Secretary on the basis of its actual bona fide value at the date of appraisal without reference to the proposed construction of the irrigation works; and that no such excess lands so held shall receive water from any project or division if the owners thereof shall refuse to execute valid recordable contracts for the sale of such lands under terms and conditions satisfactory to the Secretary of the Interior and at prices not to exceed those fixed by the Secretary of the Interior; and that until one-half the construction charges against said lands shall have been fully paid no sale of any such lands shall carry the right to receive water unless and until the purchase price involved in such sale is approved by the Secretary of the Interior and that upon proof of fraudulent representation as to the true consideration involved in such sales the Secretary of the Interior is authorized to cancel the water right attaching to the land involved in such fraudulent sales: *Provided further*, That the operation and maintenance charges on account of lands in said projects and divisions shall be paid annually in advance not later than March 1. It shall be the duty of the Secretary of the Interior to give public notice when water is actually available, and the operation and maintenance charges payable to the United States for the first year after such public notice shall be transferred to and paid as a part of the construction payment.

SEC. 47. Subsections E, F, and L of section 4, Act approved December 5, 1924 (Forty-third Statutes at Large, page 701), are hereby repealed, except as herein otherwise provided.

SEC. 48. The purpose of this Act is the rehabilitation of the several reclamation projects and the insuring of their future success by placing them upon a sound operative and business basis, and the Secretary of the Interior is directed to administer this Act to those ends.

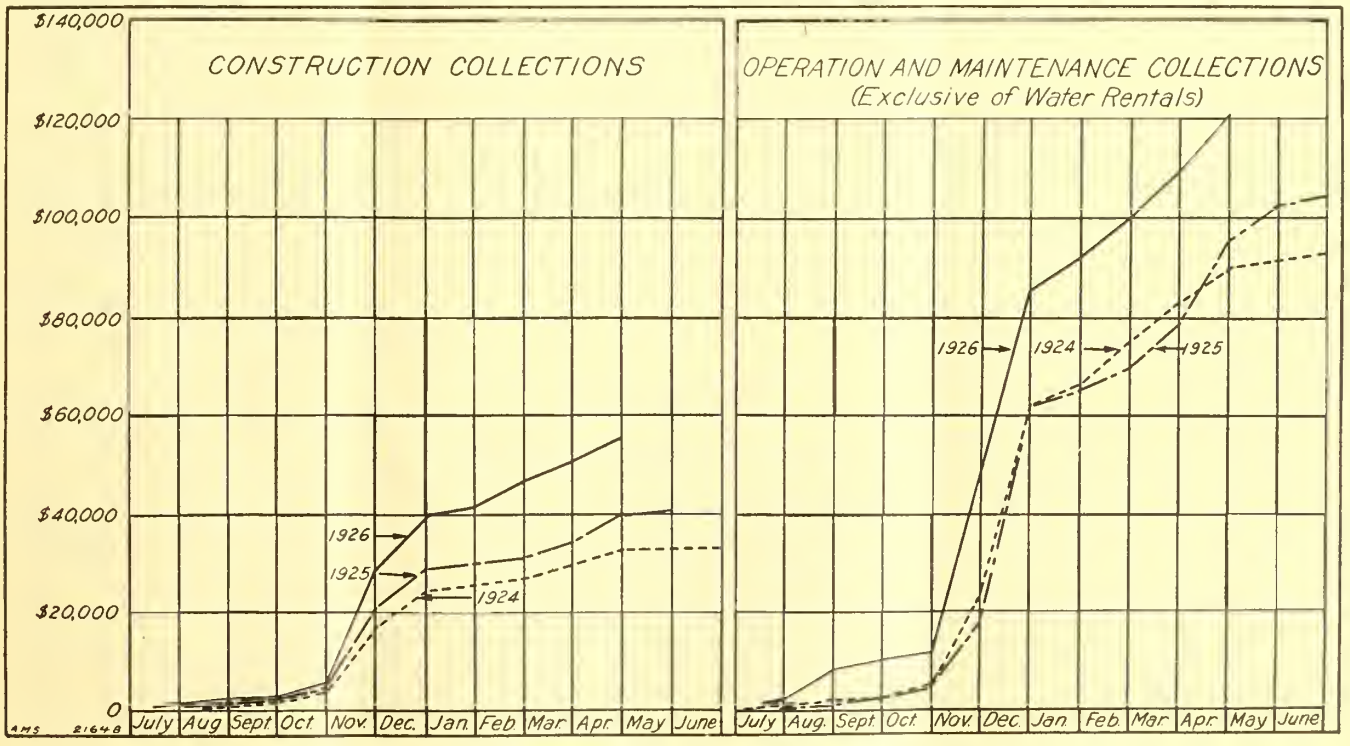
SEC. 49. Pending the execution of any contract under this Act, or the Interior Department Appropriation Act for the fiscal year 1927, or the said Act of December 5, 1924, the Secretary is authorized, in his discretion and when convinced that action looking to execution of contract is being expedited in good faith, to deliver water during the irrigation season of 1926 to the irrigation district, water users' association, or water-right applicant affected, notwithstanding delinquency in the payment of water-right charges which under the law applicable would render such irrigation district, water users' association, or water-right applicant ineligible to receive water.

SEC. 50. The adjustments under sections 1 to 40, inclusive, of this Act are declared to be an incident of the operation of the "reclamation law," a final adjudication on the projects and divisions named in such sections under the authority contained in subsection K, section 4, of the Act approved December 5, 1924 (Forty-third Statutes, page 701), and shall not hereafter be construed to be the basis of reimbursement to the "reclamation fund" from the general fund of the Treasury or by the diversion to the "reclamation fund" of revenue of the United States not now required by law to be credited to such "reclamation fund."

Approved, May 25, 1926. (Public No. 284.)

ADJUSTMENT OF WATER-RIGHT CHARGES

Project	As recommended by Board of Survey and Adjustments			As authorized by act of May 25, 1926 (H. R. 10429)		
	Amount of loss			Amount of loss		
	Definite	Probable	Total	Definite	Probable	Total
Belle Fourche	$544,521	$734,618	$1,279,139	$487,451	$734,618	$1,222,069
Boise		495,369	495,369		495,369	495,369
Carlsbad		45,867	45,867	374,886	45,867	420,753
Grand Valley	760,628	1,344,409	2,105,037	760,628	1,344,409	2,105,037
Huntley	168,981	719,642	888,623	168,981	719,642	888,623
King Hill	531,958	287,024	818,982	531,958	287,024	818,982
Klamath	170,684	62,711	233,395	1,587	62,711	64,298
Lower Yellowstone	382,254	607,017	989,271	382,254	607,017	989,271
Milk River	1,946,189	1,878,656	3,824,845	1,911,189	1,878,656	3,789,845
Minidoka	9,172	132,787	141,959	9,172	132,787	141,959
Newlands	4,536,396	813,264	5,349,660	4,649,112	813,264	5,462,376
North Platte	237,877	2,599,987	2,837,864	86,107	2,599,987	2,686,094
Okanogan	720,700	99,473	820,173	720,700	99,473	820,173
Rio Grande	43,158		43,158	381,661		381,661
Shoshone	1,715,666	534,006	2,249,672	1,715,666	534,006	2,249,672
Sun River	125,531	131,940	257,471	125,531	131,940	257,471
Umatilla	992,587	487,357	1,479,944	992,587	487,357	1,479,944
Uncompahgre	1,365,427	1,436,155	2,801,582	1,365,427	1,436,155	2,801,582
Yakima	3,068	378,124	381,192	3,068	378,124	381,192
Total	14,254,797	12,788,408	27,043,203	14,667,965	12,788,406	27,456,371

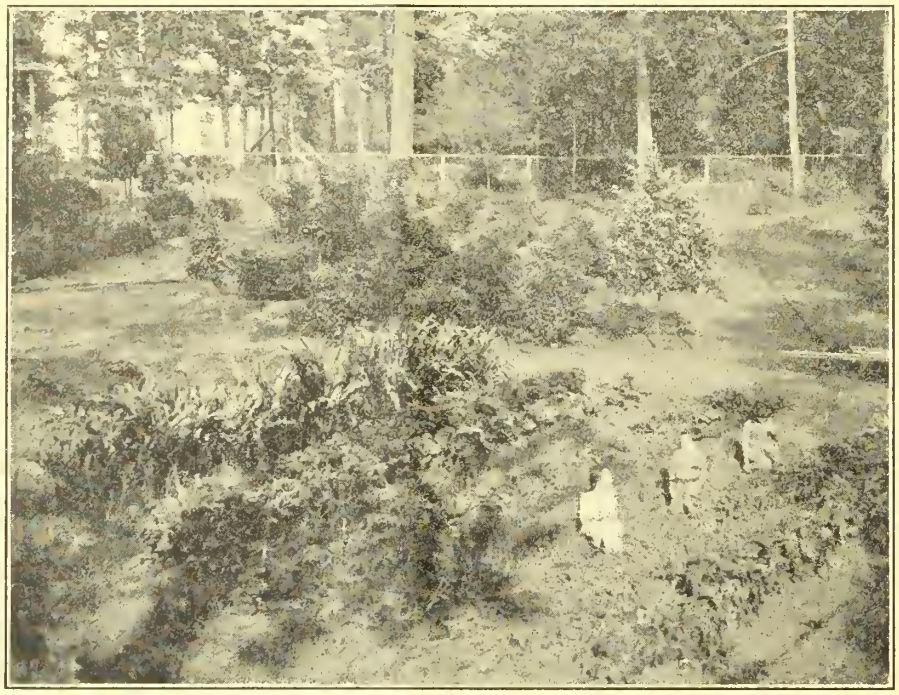


The Newlands project gets in the "Blue Ribbon" class

Project Women and Their Influence in the Home and on Farm Life

Economists are unanimous in stressing the important place occupied by women in rural life, and the value of their work in making homes out of mere dwelling places and in building up the morale of a community

By Mae A. Schnurr, secretary to the commissioner and associate editor, New Reclamation Era



Mother's little helpers

THE single man is adverse to tackling a project farm alone. The married men are in the majority. This is brought out by a review of the applications received under the new system of selecting settlers.

Farm work is hard at its best and the woman in the home is the stimulating influence. It is she who creates the comfortable farm home and looks after the health of the family, making possible the successful farm.

Family "assets" are mother's and father's little helpers, the growing boys and girls on the projects.

Experts are continually lending their time and efforts to evolve methods to lighten housework in the rural districts. Modern conveniences, taken for granted in the city, and which save the city housewife so much time, are lacking on many of our projects. A large percentage of farm homes even lack plumbing entirely. Necessity often creates inventive ability, but then the means are not always at hand. However, such things as kitchen improvement and rearrangement, installation of water, sewage disposal, light and heating systems are some of the simple changes that can be made without any great outlay of funds.

Lighting Artistically

Glare in lighting should always be guarded against. The light should be of sufficient intensity to prevent eyestrain. Beauty and color may be added to a room by the use of shades. This is an opportunity for an expression of individuality on the part of the project woman. The simplest shades may be made economically with some wire and a piece of silk. Choose a cheerful color and you will be rewarded by the effect. Even the furnishings of a room take on a different appearance under such a light.

The Project Girl

Have you ever thought what place you hold in the big task undertaken by your parents in making a home upon the land?

I know you have often wondered how mother does so much in one day. We all go through that stage but we often leave it at that and do not try to figure out how we can help, thus giving mother a pleasure and a rest at the same time. Isn't it worth the effort to see her face light up in agreeable surprise with a word of praise on her lips when you have done some little thoughtful thing that she must otherwise do herself in the course of the day?

Probably mother is going to have some neighbors in for dinner. This is where you can help. Mother is busy cooking the meal. You set the table. The success of the meal might depend on just how you do this, and at any rate its appearance will be one of the things that will stay in the minds of her guests as they depart. Therefore let us do it well.

A well laid table requires that it be first covered with a silence cloth, a regular table pad, heavy cotton flannel or its equivalent. The tablecloth should be large enough to fall from the edge of the table from 9 to 12 inches.

Guests should be seated to allow freedom of movement; about 2 feet from plate center to plate center is ideal.

The silver is placed so that the ends of the knife and fork are one inch from the edge of the table. The knife is placed at the right with the sharp edge toward the plate; the fork at the left with prongs turned up. The other silverware is placed parallel to these, and placed so that the piece to be used first is farthest from the plate and the others in regular order knives and spoons being on the right and forks on the left, with the exception of the oyster fork (if one is used) which is placed at the extreme right.

The glass is placed at the tip of the knife.

Bread and butter or salad plates are placed at the tip of the fork and a trifle to the left.

The napkin is placed at the left of the forks or on the plate.

Your centerpiece may be a bowl or low vase of fresh-cut flowers from Mother's garden.

Project Women are Versatile

Many of our projects being some distance from towns and cities places on the project woman the necessity of clothing her family by the skill of her own hands.

Lots of times a dress for "sister" or mother is spoiled by selecting the wrong color. Colors should be selected to suit the various types.

The family budget makes it necessary, however, to consider cost and although

Women on the Projects and Their Relation to Better Agriculture

The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life

becomingness is the desired effect of the wearer, durability is a factor not to be lost track of.

When the housewife purchases fabric for a garment she usually takes the word of the saleslady behind the counter as to the quality and service of her selections.

A little time would be wisely spent in a study of the fiber, weave, finish, and dyeing. The fiber might be examined by drawing out a strand here and there, and the weave finish and dyeing by studying both the upper and under sides.

The Vegetable Garden

This and the flower garden are the pride of the housewife; both serve the home.

The enterprising woman often finds a market for vegetables she raises over and above the needs of her family, both immediate and what may be preserved for use until next year's garden produces more.

A properly worked vegetable garden helps both financially and physically all members of the farmer's family. It supplies his table, which saves expenditure of funds, it supplies good healthful food, and last but not least, gives healthful exercise in the sun and fresh air that might not otherwise be undertaken and enjoyed by the housewife.

Try These

OKRA SALAD

2 dozen okra pods.
1 bead of lettuce.
1 green pepper.
1 small onion.

Boil pods of okra in salted water until they are tender, drain and drop them in cold water to chill for half an hour. Drain them dry and put them on lettuce leaves. Chop green pepper and onion fine, separately. Sprinkle over lettuce and okra and add a boiled salad dressing as follows:

MAYONNAISE DRESSING

1 egg.
1 teaspoonful dry mustard.
½ cupful of vinegar.
lump of butter (size of a walnut).

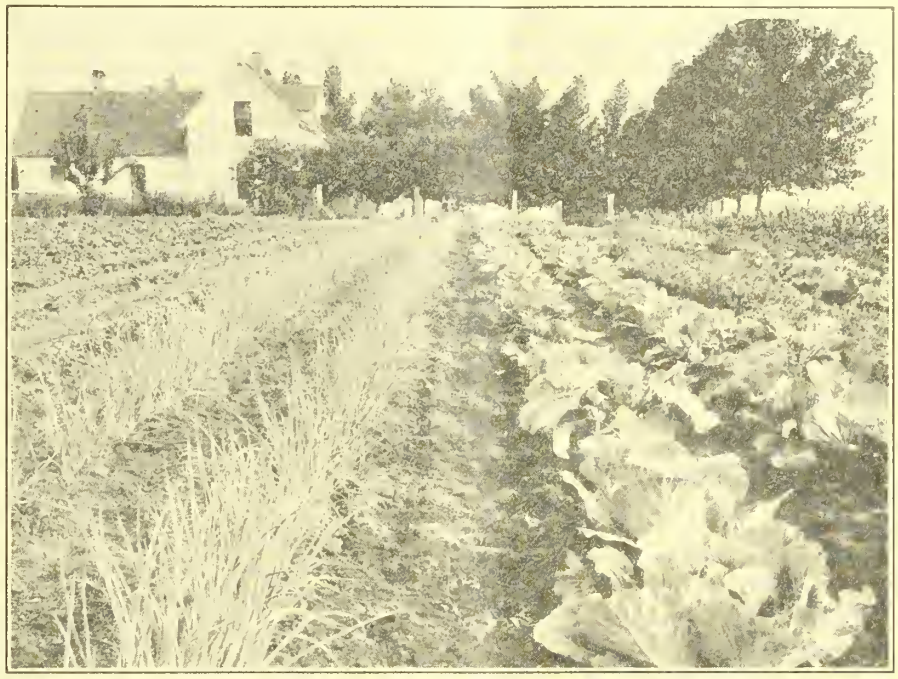
Beat egg with a good pinch of salt and 3 teaspoonfuls of sugar (even). Mix well dissolving lumps, add half cupful of vinegar. Cook this until it thickens and add lump of butter, size of walnut. Let this chill before it is spread on any salad.

Mrs. Joseph B. Perkins, Fruita, Colo. (Grand Valley project), offers the two following recipes for trial by our project women:

RICE CREOLE

1½ cupfuls of rice.
2 cupfuls tomatoes.
1 small onion.
6 slices lean bacon (or sausage).

Into a well-greased dish put a layer of cold cooked rice (about 1½ cupfuls), add tomatoes fixed as follows: 2 cupfuls of tomatoes, 1 tablespoon finely minced onion, 1 tablespoon of bacon fryings and salt to taste. Cook till onion is done. Pour over rice without stirring and place over top six slices lean bacon (or sausage) and cook in hot oven till bacon is well browned.



One of the larger vegetable gardens. Plenty to eat for the family and a reserve

COCONUT PUDDING

1 cupful brown sugar.
3½ tablespoonfuls flour.
2 eggs.
butter (size of walnut).
1 cupful shredded cocoanut.

Take 1 cup of dark brown sugar and 3½ tablespoonfuls flour. Mix well and add yolks of two well-beaten eggs, piece of butter size of a walnut. Stir very thoroughly and add 1 pint boiling water. Cook till thick, remove from fire and add 1 cupful of cocoanut and cover with meringue made from whites of eggs. Brown in oven and serve cold.

Household Hints

Use granulated sugar in the rinsing water when washing laces instead of starching them. The result will be more satisfactory.

If you want to improve the taste of your coffee made in a percolator sprinkle a tiny pinch of salt over your ground coffee before it cooks.

Have you a horsehair or a straw hat that has either lost its shape or some of its color? With a strong sugar water brush the hat on both sides with the weave. This will clean and bring out the color. Then set in sun to dry, making sure to shape it as it dries and stiffens.

Solid Comfort

After the work of the day in the fields is over, the farmer comes into his home and knows a tempting meal awaits him there.

Add to this comfort a cozy corner. The requisites are only a deep-seated chair by the window and a lamp. Here he may smoke or read, getting enjoyment and the much-needed rest until he retires for the evening. Here he may enjoy the daylight while it lasts, and the window chosen should take into account the view from it.

What farmer does not like to view his garden or his fields in such a leisurely, comfortable manner?

Relaxation after a hard day's work acts as a tonic to the human system. Lots of times it is necessary to educate people on how to relax. Unknowingly total relaxation is not always taken after strenuous exercise; the nerves and the system retain some of the tenseness of the body and in this state we do not receive the maximum benefit of resting, even if we go through all the actions of seeking relaxation.

A complete change of thought is often desirable for refreshing of the mind. This relieves mental strain and puts one in a better position to relax the muscles of the body.

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Supplying Water to Delinquents

Instructions to Superintendents

SECTION 6 of the reclamation extension act prohibits the delivery of water to applicants who are delinquent in the payment of water-right charges for more than one calendar year.

Section 49 of H. R. 10429 reads as follows:

Pending the execution of any contract under this act, or the Interior Department appropriation act for the fiscal year 1927, or the said act of December 5, 1924, the Secretary is authorized, in his discretion and when convinced that action looking to execution of contract is being expedited in good faith, to deliver water during the irrigation season of 1926 to the irrigation district, water-users' association, or water-right applicant affected, notwithstanding delinquency in the payment of water-right charges which under the law applicable would render such irrigation district, water users' association, or water-right applicant ineligible to receive water.

This section gives the Secretary authority to deliver water under the conditions stated but does not require that water be delivered to all applicants.

On projects where contracts are pending a large number of water users have paid certain delinquent charges in order that water service may not be withheld because of the provisions of section 6 of the reclamation extension act.

Others having an equal financial ability have not paid expecting all charges due and unpaid to be funded under new contracts to be executed. Justice to those who have paid demands that others equally able to make payments shall be required to do so.

With a view to the attainment of equality so far as possible directions are given that water be delivered under the following conditions:

(a) The present payment of delinquent charges against classes 5 and 6 land shall not be required as a prerequisite to water service.

(b) Water for the irrigation of land in classes 1 to 4 shall be delivered on the payment of one year's charges, those for 1924 to be paid unless some other year is fixed by special agreement approved by the commissioner. Payment shall be made in cash or by the acceptance of promissory notes with crop mortgages under the conditions outlined in circular letter 1531.

(c) In cases where in the opinion of the superintendent it will not be possible for the resident water user to make cash payment, or execute notes with crop mortgages without rendering it impossible for him to carry on his farming operations and support his family, water may be delivered notwithstanding the delinquency, provided the user gives his unsecured personal note payable January first, 1927.

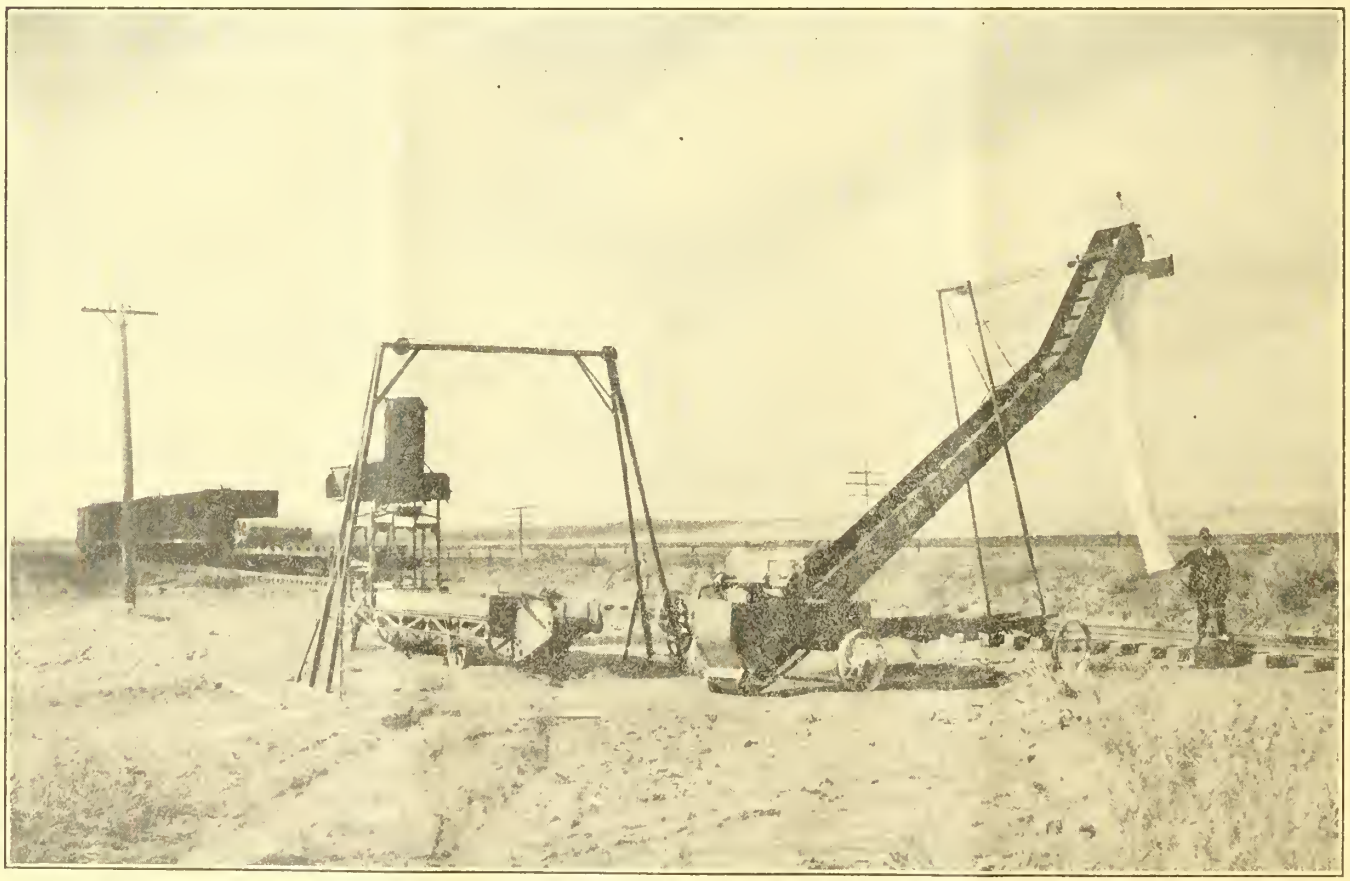
The right is reserved to exact payment under such terms as may be justified after full investigation if ability to pay shall be disclosed.

Instructions regarding accounting and other details involved will be issued at an early date.

ELWOOD MEAD,
Commissioner.

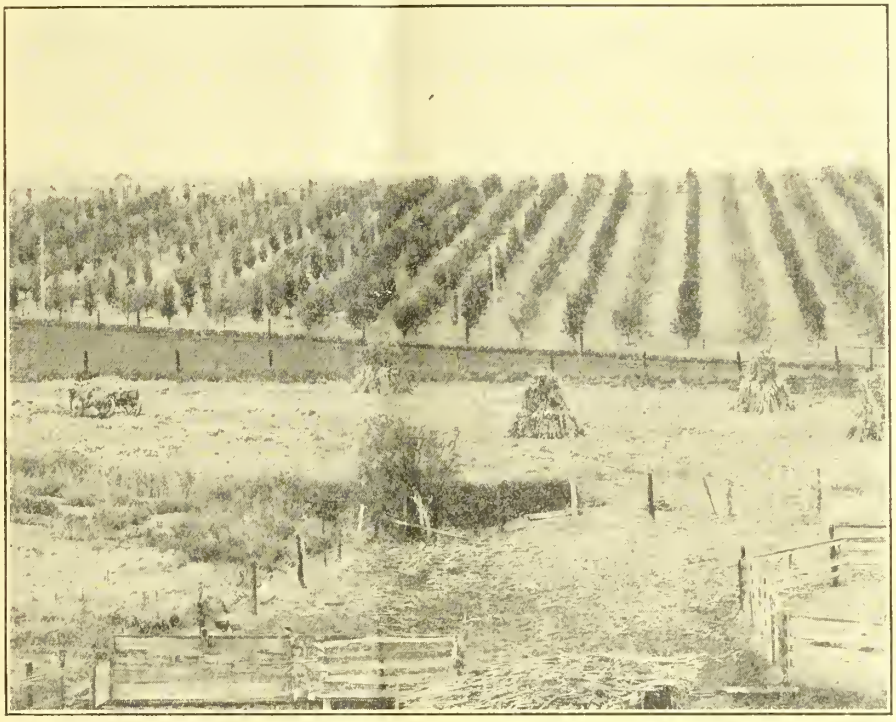
Approved: May 22, 1926.
HUBERT WORK,
Secretary.

So far as production is concerned a cow needs no more exercise than she will get by walking at will about a small yard.



This is one of the portable beet dumps used on the Milk River project, Mont. A small gasoline engine operates the machine

Costs of Fruit Raising on the Yakima Project, Washington



One of the famous apple orchards on the Yakima project, Wash.

MR. L. J. GOODRICH, a retired banker of Toppenish, Wash., owns and operates 54 acres of orchard land on the Sunnyside division of the Yakima irrigation project, near Zillah, Wash. It is located immediately above the main Sunnyside Canal and is supplied with water by two 5-inch centrifugal pumps, operating against 45 feet and 70 feet respectively.

The pumping cost for 1925, including power and repairs but not plant depreciation, was $668.25, or $12.37½ per acre.

Mr. Goodrich keeps very careful detail costs of all operation connected with his land, and the attached tabulation gives the itemized cost for producing apples, pears, peaches, prunes, crabs, and grapes.

Twenty eight acres of the tract were set out in 1908, 5 acres in 1919, and 14 acres in 1922, the remainder being devoted to alfalfa, grapes, garden, buildings, and corrals.

This orchard has a marked variety of fruit. Apples of the following varieties and proportions are grown: Winesaps, 40 per cent; Rome Beauty, 28 per cent; Staymens, 12 per cent, and New Towns, 15 per cent. Fifty-four per cent of the crop and 64 per cent of the proceeds are realized from the Winesaps. His bearing pear trees are Bartletts. The Winter Nellis are just coming to bearing. There are also Italian prunes and Elberta peaches.

A manager and two men are employed steadily throughout the year. Quarters for these employees are provided and in addition to their salaries they receive garden, fruit, and dairy products for their families. The present manager has been in charge for 14 years. A daily work report is kept by the manager and all expenditures are by check. From these data Mr. Goodrich is enabled to keep the very detailed and accurate costs of the operations of the tract.

Cost of Raising Various Kinds of Fruit, 1925, Yakima Project

	Apples (430 boxes per acre)		Pears (15 tons per acre)		Peaches (425 boxes per acre)		Prunes (600 boxes per acre)		Crabs (630 boxes per acre)		Grapes (3,000 baskets per acre)	
	Acre	Box	Acre	Ton	Acre	Box	Acre	Box	Acre	Box	Acre	Basket
Overhead	$13.79	$0.032	$13.79	$0.92	$9.76	$0.029	$11.35	$0.019	$11.35	$0.018	$9.77	$0.004
Maintenance, labor	84.25	.194	48.44	3.23	30.62	.09	31.33	.052	48.61	.08	57.76	.019
Maintenance, material	54.63	.127	33.88	2.26	20.38	.059	21.40	.036	31.83	.047	18.55	.006
Cost of raising	152.67	.353	96.11	6.41	60.76	.178	64.08	.107	91.79	.145	86.10	.029
Harvesting, labor	123.11	.287	77.42	5.16	33.95	.099	30.83	.051	116.13	.184	259.20	.086
Harvesting, material	91.44	.213	0	0	22.79	.067	57.20	.07	101.42	.162	152.50	.051
Cost of harvesting	214.55	.50	77.42	5.16	56.74	.166	88.03	.121	217.55	.346	411.70	.137
	367.22	.853	173.53	11.57	117.50	.344	152.11	.228	309.34	.491	497.80	.166
Receipts	(1)	(1)	843.92	56.26	280.13	.82	318.00	.53	498.48	.791	805.09	.268
Profits	(1)	(1)	670.39	44.69	162.63	.476	165.89	.277	189.14	.30	307.29	.102
Depreciation and interest on land	58.86	.137	58.75	3.93	46.85	.137	52.76	.088	52.76	.016	46.84	.016
Net profit	(1)	(1)	611.64	40.76	115.78	.339	113.13	.189	136.38	.216	260.45	.086

[1] Returns for apples not in.

Minidoka Project Homes Enjoy Electrical Aids

Approximately half the 2,500 farm homes on the Minidoka irrigation project in southern Idaho are supplied with electric energy which cheaply and efficiently aids the farmer and his wife in their daily tasks, according to a recent statement issued by the Department of the Interior.

In summer the greater part of the energy produced in the project power plants operated by the Bureau of Reclamation is used in pumping water for irrigation, but the project commercial and domestic load is also handled. In the winter a large amount of surplus power is used for heating.

The uses of electricity on the project farms are many and various. The most general use is for lighting. The majority of the housewives use electric flatirons and washing machines. Many also use electric hot plates, grilles, toasters, waffle irons, percolators, curling irons, warming pads, ranges, churns, sewing machines, and house fans.

The men naturally are more interested in electric motors for feed grinding, ensilage cutting, turning the grindstone and the circular saw, operating grain fans and blacksmith blowers, running cream separators, and heating incubators and brooders, all of which uses are found on the project.

Hydroelectric Power Development on The Projects

THE construction of dams to store and divert water for irrigation has afforded an opportunity for the development of hydroelectric power as an incident to irrigation. This power development has lessened construction and operation costs and materially improved the condition of farmers on these projects. The opportunity to generate this power, which would not have paid private enterprise to develop independent of irrigation, arose through the building of these works for reclamation. Only through this could the benefits have been realized.

The total investment in 13 Federal reclamation power works is $6,077,649. Their gross earnings for 1925 were $1,067,135. Net earnings were $442,619, or about 7 per cent on the total investment. This satisfactory financial showing is, however, the least part of the benefit. The chief gain has come from having this cheap power to operate pumping plants to furnish irrigation water; to use as motive power for drag-line excavators, both in building and cleaning out canals and drains. In some cases these power plants have paid for themselves in the lowering of construction costs.

Cheap power has put electric lights in the homes of people living on the Minidoka, Shoshone, North Platte, and other projects. Owning the plants enabled power to be furnished at a price the settler could afford to pay. If settlers had been compelled to pay the rates which a private power plant would have had to charge, the farmers' wives would now be using gasoline and kerosene.

It has helped to develop local industries on projects like Shoshone and Minidoka, and as the projects become more completely and closely settled and the farms are better improved and more productive, the need for power in farming operations and for lighting homes will increase. This will bring increased revenue from these power plants. Yuma is an illustration of the better result to come. It cost $320,000, which is included in the $6,000,000 investment, but the net yearly revenue, estimated to be $50,000, will only begin to be received after July 1, 1926.

If it were not for the power revenues of the Guernsey Reservoir, the charges to be paid by irrigators for the stored water would have to be doubled, and this would be a burden they could not carry. The feasibility of this development depended on the revenue from power which it would make possible.

With the increased cost of irrigation works in the future, the revenues from power must be depended upon to lessen the burden on the irrigator. It will make projects feasible that could otherwise be built only at a financial loss to the Government.

The Lingle power plant on the North Platte project, Nebr.-Wyo.

Snake River Water-Right Controversies Settled

A contract which will probably have a far-reaching effect upon controversies over Snake River water rights during the 1926 season was entered into at Rupert, Idaho, on May 22. The agreement between the United States and the Upper Snake River Valley Water Users' Protective Union and approved by representatives of the irrigation districts on the Minidoka project and officials of the Twin Falls projects, sets forth a plan by which owners of decreed rights in the upper valley will be permitted to make use of Jackson Lake Reservoir for storing normal flow and also make temporary transfers among themselves on condition that all water so stored or transferred is subject to a toll charge of 17½ per cent, payable to lower valley users. It is believed that these privileges will be of great value to canals whose normal flow rights are likely to become invalidated by midsummer, as it will enable them to hold some water back for the irrigation of later and more valuable crops, such as potatoes and sugar beets.

New South Wales Plans To Construct Large Dam

H. H. Dare, commissioner, Water Conservation and Irrigation Commission, New South Wales, Australia, has written to Commissioner Mead as follows concerning proposed water supply development in that country:

"I am very much indebted to you for your kindness in forwarding the NEW RECLAMATION ERA, which contains some articles of great interest. I am especially interested in the section of the proposed Colorado River Dam, which represents such a tremendous advance in height and capacity over anything yet attempted.

"We are at the present time considering a large dam on the Warragamba River, principally for the supply of water for Sidney. On account of the magnitude of the flood to be provided for, and the height of the structure, this will be a considerable undertaking, but not, of course, in any way approaching the Colorado."

THE early pea crop on the Strawberry Valley project has been harvested, and yields of about three-fourths of a ton per acre were reported. The growers received $75 a ton for these early peas. Prospects are excellent for abundant yields of all crops.

Weed and Trash Screen for Canals

Sunnyside Division, Yakima Project, Wash.

By J. L. Lytell, Superintendent

FLOATING weeds, moss, and other débris constitute one of the most serious difficulties in the way of a successful operation of our irrigation system. Not only do they add materially to the hazard and cost of canal and lateral operation and maintenance, but are one of the chief obstacles to the continuous delivery of water necessary for the successful irrigation of the farm.

The most common type of weed screen heretofore used has consisted of iron bars, two by fours, or other timbers placed across the canal channel on slopes of varying degrees and spaced from a few inches to a foot or more apart. These were objectionable for several reasons. Under severe conditions they required an excessive amount of attention in order to prevent clogging, which limited the canal and lateral capacity by seriously reducing the cross sectional area. They were used, therefore, only where they could be given the required attention, or where clogging was less apt to occur with their use than if they had not been installed.

A type of screen has been devised by M. D. Scroggs, irrigation manager, and Dominick Carmody, maintenance engineer, on the Sunnyside division of the Yakima project, which gives very satisfactory service with such attention as the ditch rider may easily give it on his regular rounds, This type of screen, as installed at Mile 60 on the Sunnyside division, is shown in the accompanying illustration and has functioned very satisfactorily.

It is believed that by proper designing the principle on which this screen is based can be applied to almost any condition that may exist in the ordinary canal and lateral, and thus greatly lessen the interference with the delivery of water caused by clogging of intakes to turnouts and siphons, resulting in more satisfactory delivery of water to the water user.

Although the same general principles control, each installation should be varied to meet the peculiar conditions of the location. The length and width of screen, depth of the subgrade basin, and the spacing of bars will depend upon the canal or lateral cross section, the character of débris to be handled, the amount of silt in the water, and the frequency of attention which can be given.

Certain factors have so far been noted as advisable in any installation. A depth of water of 1½ feet should be had over the bottom screen. The width of the bottom screen should be the same as the bottom width of the canal or lateral. There should be no cross braces and the bars should be supported only from the ends. The subgrade basin should not be less than 1½ feet in depth. A check placed below the screen and regulated by flashboards to maintain a uniform water surface will assist the proper functioning of the screen.

The success of the screen is due chiefly to two things. The screen area is large and while the slope portion of the screen may fill, water finding its way through the subgrade basin prevents the débris from forming a tight dam. Except under the severest and most exceptional conditions, our screens require only the ordinary attention which can be given by a patrolman on his regular route. Where silt conditions are bad, by the removal of all checks below and by allowing the screen to remain partially clogged, the subgrade basin will scour.

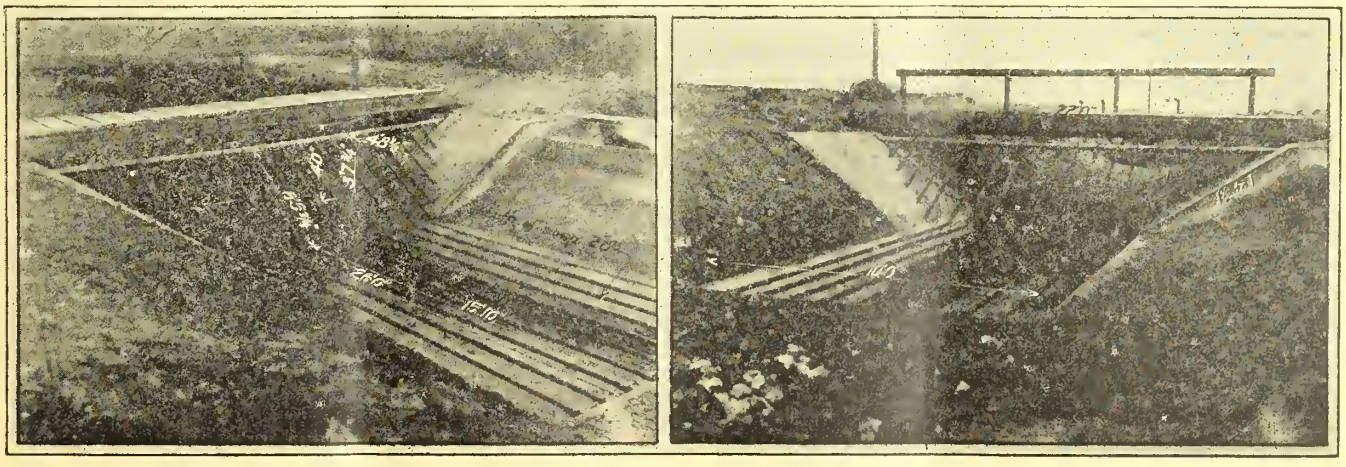
Local Money Hard to Get for Loans on Some Lands

On some of the projects where delinquencies in payment of construction and operation and maintenance charges are most noticeable, local money as a rule is no longer available for project loans. The answer is not hard to find. In a number of cases the holders of mortgage loans have been compelled to take over certain properties and at the time of doing so have also had to pay up the delinquent charges.

A case in point happened recently. A local resident on one of the projects loaned $5,000 on some land several years ago to two water users. Since 1921 no operation and maintenance, water rental, or construction charges were paid by the water users, for the reason that under the operations of the blanket and individual relief they were able to obtain water from year to year. During those years they received all the profits from the farm. When it became necessary to make payments in 1926 in order to receive water they relinquished the property to the lender, who, on ascertaining the delinquent charges, found it necessary, in order to pay everything up to date, to give his check to the project office for more than $1,700.

Naturally this man is not favorably disposed toward loaning any more money on lands on this project; and in case he does loan any more money on such security, he will adopt the policy of other loan agencies of forcing the owner of the property to keep up all charges from year to year.

Breeding, feeding, diseases, common ailments of cows and their treatment, types of dairy buildings, and sanitation are discussed in Farmers' Bulletin 1470-F, "Care and Management of Dairy Cows."



Weed and trash screen, Yakima project, Wash.

The Sesquicentennial Exhibit

By the Department of the Interior

A MODEL of a Government-irrigated farm, a miniature geyser spouting water at regular intervals, historic land maps of the United States, magnificent painted views of the National parks, a panorama of the loop district on the Alaska railroad and almost life-sized pictures of reindeer grazing in valleys surrounded by snow-covered mountains in Alaska are a few of the features included in the exhibit of the Department of the Interior at the Sesquicentennial Exposition now being held in Philadelphia.

Practically every bureau and branch of the Interior Department will participate in the exposition with an especially arranged exhibit depicting their various activities. These include the Bureau of Reclamation, National Park Service, the Geological Survey, Alaska Railroad, General Land Office, Bureau of Indian Affairs, Bureau of Education, and the Pension Office.

A feature of the exhibit is an immense poster, 5 by 8 feet in size, with a series of panels containing hand-painted photographs illustrative of the work of the various bureaus of the Interior Department. Below each picture is a brief, detailed outline of functions performed by each of the bureaus. This poster is surmounted by an immense seal of the Department surrounded by American flags.

The model of a 40-acre irrigated farm included in the Reclamation Bureau's exhibit will show irrigation water running in the canal, laterals, and farm ditches with the farmhouse, barn and other buildings in miniature as well as the various plots of ground planted to different crops. Colored enlarged photographs of some of the famous dams built by the Bureau, irrigation scenes, crops and livestock on reclamation projects will also be shown. Other displays of the bureau are a wall map, 9 feet in length, showing in colors the location of all the federal irrigation projects, another outlining the Colorado River basin, and a group of structural diagrams of engineering works.

On one side of the model farm an automatic daylight motion picture machine tells continuously the story of reclamation from the snow-capped mountains to the completed farm, showing storage and diversion dams, the desert before and after reclamation, preparing the land for crops, the first homes of the settlers, harvesting the crops, schools and other evidences of economic development.

On the other side of the model an automatic film slide delineascope calls attention to opportunities for settlement on the projects, with particular reference to the Belle Fourche, Lower Yellowstone, and Riverton projects, where intensive settlement campaigns will be in progress this summer.

The exhibit should be of real value from an educational standpoint in calling to the attention of the millions who are expected to visit the exposition, the place which Federal reclamation holds in the economic life of the West particularly, as well as that of the country as a whole.

A replica of a log cabin with a window through which is shown the loop district of the Alaska Railroad in minature with a train in the distance and great mountains and valleys in relief comprises one of the most novel displays of the department. In this exhibit are also a number of oil paintings of the awe-inspiring scenery along the Alaska Railroad, the only railroad owned and operated by the United States Government. The present transportation system of this northern territory, including ocean, river and railroad routes, is presented in a large colored map.

Reproduction of the Grand Canyon, the most remarkable work of erosion to be found throughout the world, will be a feature of the National Park Service exhibit together with the small model of the Old Faithful geyser in the Yellowstone National Park and another model of the crater of Kilauea Volcano in the Hawaii National Park. Striking panoramic views of other magnificient scenic effects in the various parks make up the remainder of the display of this bureau.

An original land patent signed and sealed by King George III of England, the first United States Government patent ever issued involving a tract of land in Ohio, patents signed by the Nation's early presidents, and military land bounties to Lincoln, Grant, Sherman, and other notable figures of American history are the features of the exhibit of the General Land Office. In addition, there will be illustrated the origin, manner of disposition, and present status of the public lands of the United States through maps, charts, and diagrams.

The exhibit of the Bureau of Indian Affairs is designed to show the progress made by the Indian race during the last century, through a contrast between his original mode of living and his present status. Native Indian art consisting of pieces of ancient and modern pottery, Indian basketry and bead work, and Indian designs as taught in the Indian schools of to-day will be on display. The art of blanket weaving as practiced by the Navajo and other Indian tribes will be portrayed by a Navajo Indian woman actually weaving these articles while a Navajo Indian silversmith will also be at work making various silver ornaments.

Work of the Geological Survey in mapping rivers, measuring their flow, choosing dam sites for irrigation, water power and flood-control projects will be illustrated through enlarged photographic displays and motion pictures. One of the boats used by the engineers, who recently made an expedition down the Grand Canyon of the Colorado, will be on exhibit for the first time. The rôle played by this bureau in the development of the nation's oil industry is described by charts, maps, and photographs in conjunction with a wooden model of a derrick in motion as though drilling a well.

Pictures of renowned warriors of the United States, martial scenes, pictures of aged pensioners and survivors of the Mexican War and the living mothers of Civil War veterans will be the principle features of the Pension Bureau exhibit. Valuable documents from the archives of the Bureau, which reveal the history of the Republic, will also be displayed. A unique part of the exhibit will be stacks of arms of the different rifles used in the War of the Revolution, the Mexican War, the Civil War, War with Spain, and the World War.

An immense scenic panorama, 8 by 12 feet in size, depiciting a typical reindeer herd grazing in a river valley in the mountains of Alaska with a model of an Alaska native herder in the background illustrates the reindeer industry in Alaska conducted by the Bureau of Education. Educational advancement of the United States in all its phases including elementary health hygiene, home economics, home nursery, kindergarten, rural, technical and collegiate is shown by charts, plates, pictures, and diagrams. This bureau's exhibit also presents a model of an up-to-date one-room school in the State of Delaware.

The breeding flock which is maintained to produce fertile eggs that will hatch into vigorous, healthy chicks should be fed entirely differently from the hens kept for market-egg production.

Sheep frequently suffer for water. A sheep needs from 1 to 6 quarts of water daily, depending on the feed received, the weather, and the condition of pasture.

George Strohm Believes in Future of Umatilla Project, Oreg.

(An interview in the Hermiston Herald)

"WHAT do you think of this country as a place for a farmer to make money, and what do you think of its future?"

This question was asked the other day of a project farmer in the Herald office, after he had transacted some business that brought him in.

The man addressed thought an instant and rolled his cigar half over between his lips.

"I don't know where I could go to get along any better if I wanted to leave here," he replied. "I've been financially broke a couple of times in my life, and the going hasn't always been easy, but I don't know a better place to get ahead than this country right here.

"Of course, a man has to work hard to get ahead here. I guess that is true anywhere in the world. Then he has to use his head. Some men work from early in the morning until 10 o'clock at night and still fail to make a go of their farming. They don't use their heads.

DON'T DO A HALF JOB OF FARMING

"I think a man should buy what he can pay for, and what he can't afford to buy he should not buy. In farming there is no use half doing the job. I'd rather have two acres of any given crop and take care of it right than to have 10 acres and do half a job of farming it. Last year we had two acres of potatoes on our place, and they made us some nice money. We always raise all the garden truck we need, put up meat and lard, fruit and vegetables. Then we milk a few cows, never very many, and we have a small flock of chickens. Milk, cream, butter, more than enough eggs to supply our wants and a few chickens to eat whenever we want them make the actual cost of living mighty low at our house. That makes our big crops count up pretty fast when we get the money in after selling them.

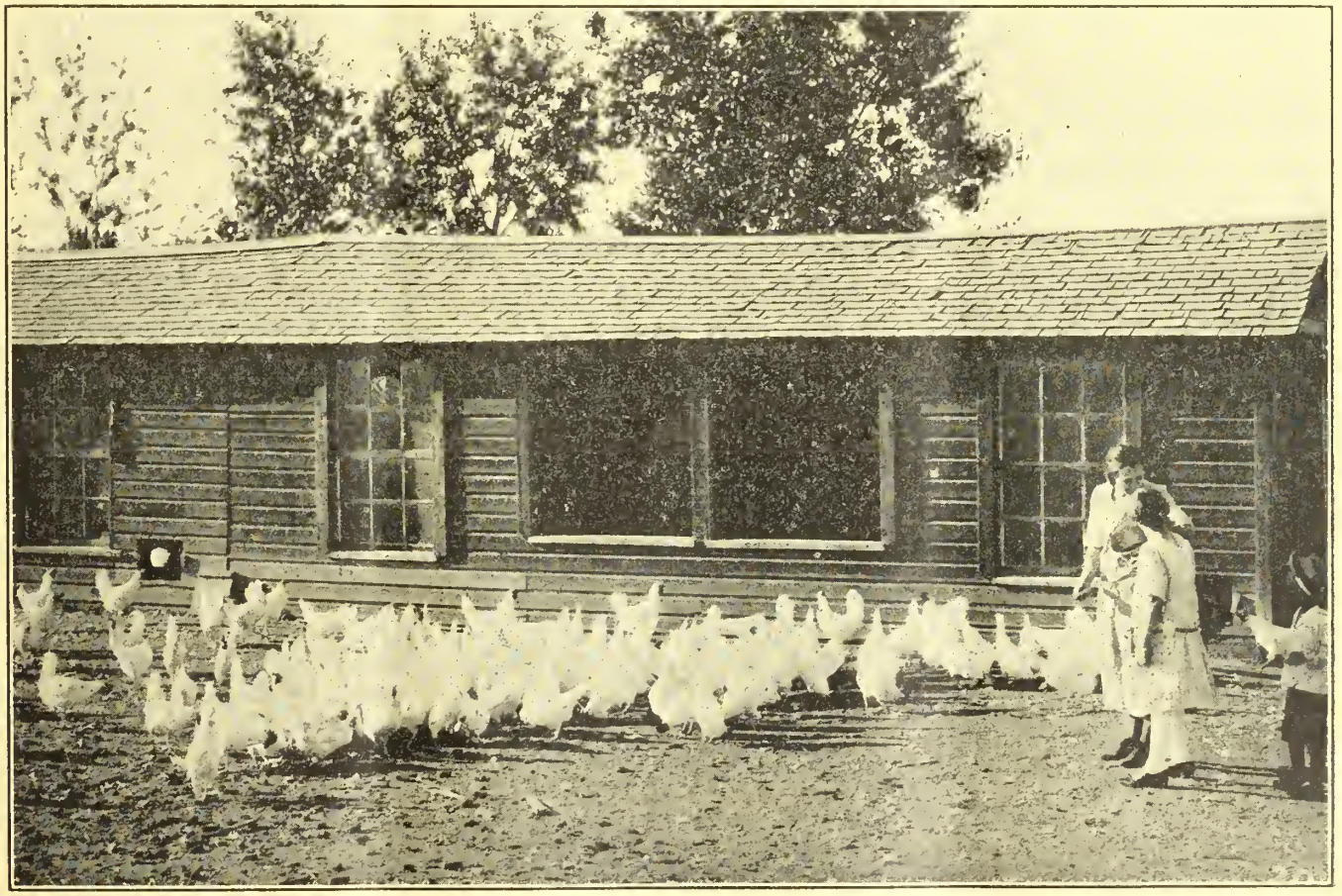
"This is a good country. Sometimes you can hear farmers talk that have the blues, but not all the discouraged farmers live on irrigated land. Go up into the wheat country. Along with a lot who have made money and kept a chunk of it a man can find others who have not been successful.

THE HUMAN FACTOR

"In my opinion, success or failure in this farming business depends as much (or more) on the individual as on the country in which he may happen to live. I don't know of any better place, everything considered, than this Hermiston country."

The farmer who uttered the above was not giving an interview. He was visiting and talked in response to one leading question and a number of others that followed during the course of the conversation. He might have been one of a score or more of farmers living in the immediate vicinity of Hermiston.

It so happened that the farmer was George Strohm.



Chickens are a profitable source of income on many projects

Efficiency of Irrigation

ARIZONA Experiment Station Bulletin No. 101 points out that every progressive farmer can easily investigate the general efficiency of his irrigation system. In the first place he should set a weir or other measuring device and keep a record of the amount of water applied to each field. His records will serve as a basis for comparisons. There are several simple means by which he can ascertain the nature and extent of his water losses. Some of the most useful are the following:

1. He can note with a watch the number of minutes during which the head end and the center and the tail end of land or furrow get water.

2. Pits dug to a depth of 6 feet with a posthole digger at different points in a field will show whether the irrigation is uniform and whether the soil is wet amply or too much. The pits should be dug about 20 hours after the irrigation. In lieu of the pits, a sharp stick can be thrust into the ground at various points, and much can be learned thereby of the penetration of the water. A better tool is a pointed metal rod with a groove 1 foot long in the side near the point. By driving the rod to any depth, rotating it there, and then withdrawing it, a sample of the soil at that depth is obtained. Better still is a soil auger; it is convenient and most useful, and every farmer can well afford to own one.

3. Observation of the water level in near-by wells may indicate whether the ground-water plane is rising, due to over-irrigation.

4. Does the soil surface bake? If so there must be heavy loss of water by evaporation. A farmer can demonstrate to his own satisfaction how far evaporation losses can be reduced by cultivation by leaving a few rows uncultivated and observing the condition of the plants and the drying of the soil up to the time of the next irrigation.

The efficiency of irrigation can be defined as the ratio of that portion of the water actually utilized by the crop to the total quantity applied to the land. It is the farmer's province to endeavor to make this ratio as high as possible and thus to decrease the amount of water needed for his ranch.

Yield and Profit From Sugar Beets in Montana

The following table, from an article on the production of sugar beets in Montana, printed in the May and June issue of the Irrigation Review, illustrates clearly the relation of yields to cost of production and profits in raising sugar beets in that State:

The cost and profit from sugar beets as related to yields per acre

Classification (yield per acre, tons)	Per acre		Per ton	
	Cost	Profit	Cost	Profit
4 and less	$43.13	−$19.66	$12.59	−$5.74
4.1 to 5	45.18	−12.66	9.20	−2.56
5.1 to 6	46.91	−7.20	7.87	−1.21
6.1 to 7	51.36	−5.90	7.46	−.86
7.1 to 8	51.52	−.56	6.50	−.07
8.1 to 9	55.85	1.45	6.26	.16
9.1 to 10	55.87	6.56	5.64	.66
10.1 to 11	56.07	12.84	5.14	1.18
11.1 to 12	59.93	16.34	5.00	1.36
12.1 to 13	58.61	23.48	4.58	1.83
13.1 to 14	60.47	28.15	4.32	2.02
15.1 to 16	64.69	33.95	4.06	2.13

Explanatory Articles On New Contracts

The August ERA will contain the first of a series of articles describing and analyzing the plans and conditions under which the Department of the Interior is to develop the new projects for which money was appropriated by the Sixty-ninth Congress.

The first article will deal with the Kittitas division of the Yakima project. Owyhee will be the second, Riverton third, and the others will follow as plans are perfected and contracts signed.

The publication in the July issue of the adjustment act introduced by Congressman Smith of Idaho will be followed through several months with articles explaining contracts made with projects based on the fact-finders' act and the adjustment act. The first will deal with the King Hill project and will be followed with an article describing the contracts and adjustments under which district water users have taken over the operation of that project. The purpose of these articles is to inform the readers of the ERA of what is being done under these two far-reaching legislative acts and why.

Under these contracts the operation and maintenance of four important projects is assured by the water users. On three others there will be a period of preparation in which the aim will be to overcome a backward agricultural development and insure an adequate operating revenue before appropriations from the reclamation fund are cut off.

Pressure Test for Maturity of Fruit

The maturity of fruit at picking time largely determines its dessert quality as well as its storage or transportation possibilities. Allowing the fruit to become too mature on the tree results in a product which will not carry to the market, whereas picking the fruit in a too immature condition results in an almost inedible product.

Pressure on the fruit with the thumb to determine the maturity has probably been practiced as long as fruits have been eaten by man, but this method is too indefinite for modern demands of fruit dealers and handlers. This need for definite picking standards for certain fruits which will allow them to be left on the tree as long as possible and at the same time assure their carrying through to market in satisfactory condition, has led the United States Department of Agriculture to devise an improved type of mechanical pressure tester, a description of which is given in Department Circular 350 just issued by the department.

The pressure tester is somewhat on the order of an automobile-tire pressure gauge, is of convenient portable size, and easy to use. A protruding plunger of the tester, placed against the flesh of an apple or other fruit, penetrates the flesh, recording the maximum pressure required to penetrate the fruit to a given distance, thus giving an indication of its maturity. By means of the tester and storage experiments definite picking standards are being worked out for the various fruits. The rate of softening of fruit in storage and the firmness of fruit in different stages of storage maturity are also being studied.

When these schedules have been completed, the fruit grower will know at what pressure he should pick his fruit to enable it to stand the storage and transportation conditions expected of it. The fruit dealer will be able to test his fruit in storage and determine the remaining length of time he can expect it to keep in firm condition.

A copy of the circular may be obtained free of charge, as long as the supply lasts, by writing to the United States Department of Agriculture, Washington, D. C.

Motion Pictures Show Project Development

Motion and still pictures are beign taken this summer of scenes showing the economic and social devclopmcnt of the irrigation projects undcr the Bureau of Reclamation.

Dr. Elwood Mead, Commissioner of Reclamation, left for the West on June 17, planning to return to Washington on July 21, after visiting a number of the reclamation projects, particularly in the Northwest. He was accompanied by Maurice G. Ricker, photographer, equippcd with motion-picture and still camcras, who is making a thorough photographic survey of the projects visited, paying especial attention to obtaining pictures showing what has been accomplished by the water users in community development.

Mr. Ricker visitcd first the Southwestern projects, Carlsbad, N. Mex., Rio Grandc, N. Mex.-Tex., and Yuma, Ariz., joining Doctor Mead at Bcrkeley, Calif. They next visited the Orland project, California, the Okanogan project, Washington, and the Yakima project, in the same State, whcre work is in progress on the construction of the ncw Kittitas division of the project, for which appropriations were made by Congress at the presont scssion. From that point the party planncd to visit the Umatilla project, Oregon, going then to the Belle Fourche project, South Dakota, where, on July 17, the annual farm picnic of this project will be held, to be known this year as "Doctor Elwood Mead Day," in honor of the commissioner.

Mr. Rickcr may also make a photographic survey of the three Idaho projects, Boise, King Hill, and Minidoka, and before returning to Washington visit the Grand Valley and Uncompahgre projects, in Colorado, and the North Platte project, in Nebraska and Wyoming.

Motion-picturc reels will later be made up for distribution to educational organizations, chambers of commerce, and others interested in the relation of reclamation development to the economic life of the Nation.

Two Litters A Year Reduce Hog Costs

Hog production costs are lower when two litters of pigs are raised each year than when only one litter is raised. Adding fall pigs to the production plan means a slight increase in feed and labor costs for each 100 pounds of pork produced. Other costs, however, are decreased chiefly because it is easier to save pigs at weaning time in the summer than in the spring. The economy of producing two litters a year is also shown in a lower necessary capital investment. Maintenance costs of the breeding herds are slightly higher when two litters are raised, largely because sows are on the farm for a longer time. On a monthly basis there is practically no difference.

Motor Truck Proving Great Aid to Farmers

Transportation of farm products by motor truck has increased tremendously in the last few years, particularly in dairying and livestock regions. This development has not, however, with a few local exceptions, invaded the proper and profitable field of the railroads. Usually motor-truck and railway service are complementary and not competitive.

The motor truck has increased farm efficiency, developed old markets and established new ones, speeded the conversion of raw material into finished products, facilitated marketing and distribution, and made it possible for farmers to take advantage of variations in demand at various markets. It has provided a service giving a complete movement from shipper to consignee without transfers or reloadings.

Yuma Mesa Orchards Make Fine Showing

Reports from the Yuma Mesa indicate that all the orchards that have had reasonably good care are showing a wonderful growth and that another year will bring forth considerable production. Many of the young trees that will be 3 years old next spring have sufficient size and body to produce from half a box to a box of grapefruit, and if conditions are as favorable as they usually are the trees should make a very favorable showing a year from now. The results on the 500 acres planted are drawing considerable attention all over southern California and Arizona. More people are coming in to look over the Mesa and more interest is being taken. Apparently it is only a question of time when more of them will be investing. The outlook for next year is for an increased acreage of plantings over that of this year.

These projects have helped in the conquest, for human good, of the more difficult places of our country, and thereby have shown the great value of the arid and semiarid region as a part of the domain which, in the providence of God, has been given to our country.

A group of mortgage lifters on the Huntley project, Mont.

Organization Activities and Project Visitors

A MEETING of the Commission on the Equitable Use of the Waters of the Lower Rio Grande, of which Commissioner Elwood Mead is chairman, was held in his office, beginning June 26. The other members of the commission are Gen. Lansing H. Beach and W. E. Anderson. Miss Mae A. Schnurr, secretary to Commissioner Mead, has been designated secretary of the commission.

Consulting Engineer A. J. Wiley was called to Denver recently to serve on a board meeting in connection with plans and specifications for the Stoney Gorge Dam on the Orland project.

Barry Dibble, consulting engineer, called at the Denver office in regard to the question of furnishing temporary power to the Minidoka project in lieu of developing additional power at Minidoka Dam for American Falls.

State Engineer F. C. Emerson visited the Denver office to arrange for the completion of the reports on cooperative investigations under contract with the State of Wyoming.

C. H. Howell, engineer in the Denver office, has submitted his resignation to accept the position of designing engineer for the Middle Rio Grande Conservancy District, of which J. L. Burkholder, former drainage engineer of the bureau, is now chief engineer. I. E. Houk, engineer in the Denver office, has started investigations under the cooperative contract with the district.

Porter J. Preston, superintendent of the Yuma project, made an inspection recently of the foundation for the Horse Mesa Dam on the Salt River project.

Superintendent L. J. Foster and Chief Clerk G. H. Bolt, of the Uncompahgre project, were on the Grand Valley project recently to arrange for the transfer of equipment to the Uncompahgre project.

Acting Superintendent Stuver, Newlands project, was in Reno recently to confer with District Counsel Coffey, United States Attorney Springmeyer, and Roy W. Stoddard, attorney for the district board, regarding the Carson River adjudication suit.

Earle R. Mills, who has been chief clerk of the Boise project for the past 10 years, has been transferred to the Kittitas division of the Yakima project.

District Counsel Stoutemyer spent some time on the Minidoka project in conference with other attorneys and irrigation officials upon the matter of securing an agreement between upper and lower Snake River Valley interests concerning water rights. Other visiting officials were the members of the committee of nine of water district No. 36, including John Hart, chairman, Rigby; John E. Kelly, Shelley; L. C. Walker, Aberdeen; W. O. Cotton, Idaho Falls; Frank A. Miller, St. Anthony; Eph. Peterson, Rexburg; R. E. Shepherd, Jerome; and T. M. Baird, Twin Falls. Others present were John Lee, secretary, G. Clyde Baldwin, water master, and James Heath, president of the Upper Snake River Valley Water Users' Protective Union; Joseph Peterson, attorney, Pocatello; Frank Bower, director, and J. R. Bothwell, attorney, Twin Falls Canal Co.; Adam Barclay, attorney, Jerome; Maurice Myers, attorney, Aberdeen; and F. A. Banks, construction engineer, American Falls.

W. L. Drager has been detailed from the Denver office as resident engineer on the completion of the St. Mary's and Hall's Coulee siphon crossings, Milk River project.

H. H. Johnson has been designated superintendent of the Milk River project, succeeding G. E. Stratton who has been placed in charge of the Heart River investigations.

J. R. Yates, Carlsbad project, spent several days in Las Vegas in connection with the Pecos River adjudication suit.

Miss Dorothy Shott, assistant clerk on the Riverton project, resigned during May.

Erle H. Reed, attorney, and Joyce Teppet, president of the board of commissioners, Torrington, Wyo., spent several days in the Washington office representing the Goshen Irrigation District, North Platte project, in negotiating a contract.

Cost keeper C. L. Harris, formerly employed in the Hatch office, Rio Grande project, has been transferred to the main office to fill the vacancy caused by the separation of timekeeper M. W. Nichols.

Rosendo Reinoso, of the Bureau of Public Works, Department of Commerce and Communications, Philippine Islands, was a recent visitor in the Washington office, studying methods of accounting and office administration of the bureau.

Commission on the Equitable Use of the Waters of the Lower Rio Grande. Left to right: Miss M. A. Schnurr, secretary; Gen. Lansing H. Beach; W. E. Anderson; Dr. Elwood Mead, chairman

Superintendent Whittemore, of the Strawberry Valley project, who has been temporarily assigned to an investigation of the Neeley project, Idaho, returned to the Strawberry Valley project the latter part of May.

J. L. Savage, designing engineer from the Denver office, visited the Yakima project recently to inspect the Zillah wasteway.

Senior Clerk C. B. Wentzel has been transferred from the Riverton project to assume the duties of cost keeper and engineering assistant on the Kittitas division of the Yakima project.

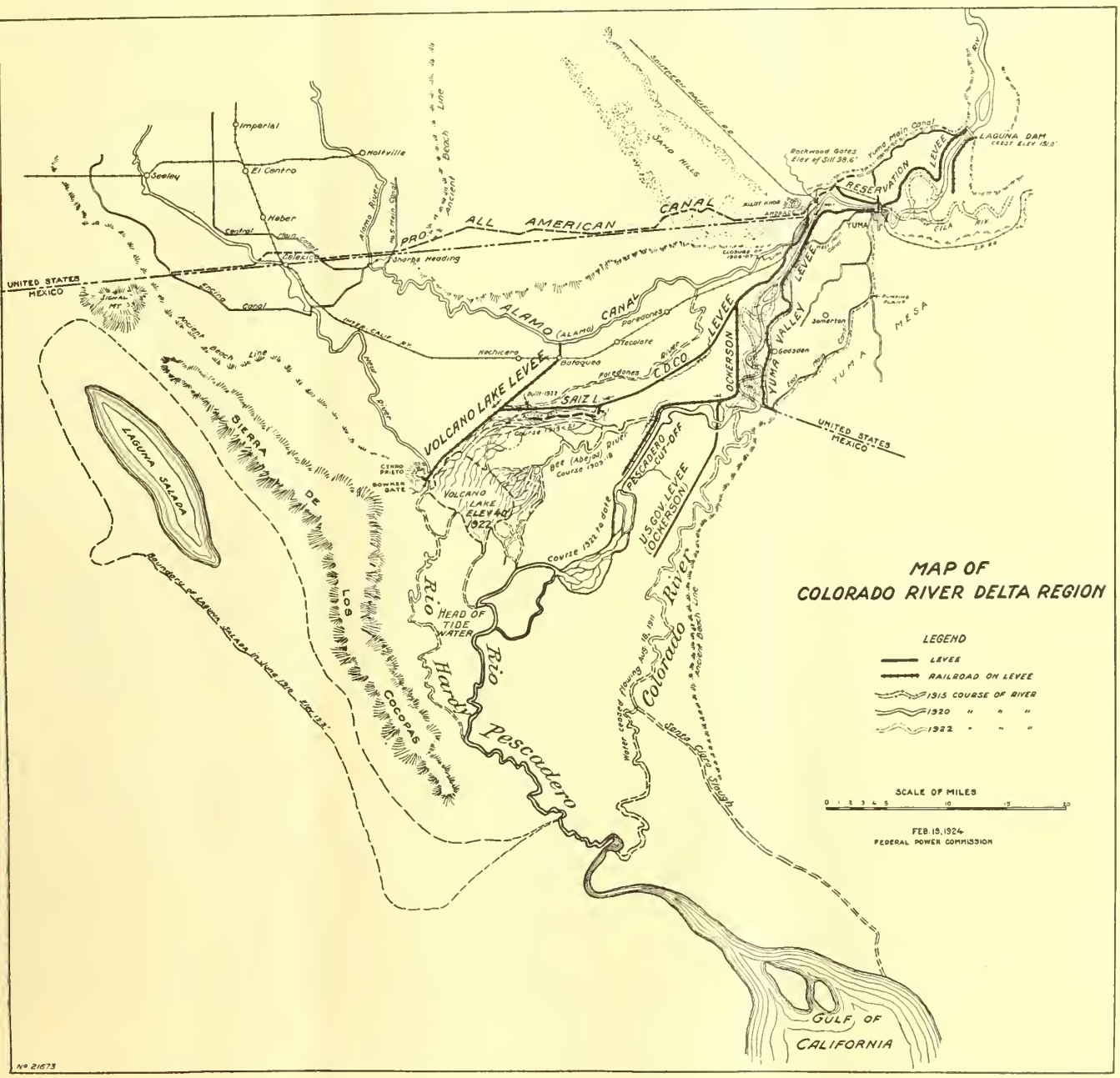
L. M. Lawson, Superintendent of the Rio Grande project, was in the Washington office recently in connection with the compilation of data concerning water-supply conditions of the United States and Mexico.

Officials of the California-Oregon Power Co. of Medford conferred recently with Superintendent Newell, of the Klamath project, and the project hydrographer in regard to the expected yield of Upper Klamath Lake.

District Counsel Burke was on the Belle Fourche project during May to consider legal matters and to give particular attention to taxation of unpatented entries, which has been the continuous practice in that county. A meeting was held with the county auditor, the county attorney, and one commissioner.

O. G. Boden, engineer on the Riverton project, has been transferred to the Kittitas division, Yakima project, to take charge of the work of lateral locations.

The proposed Colorado River development, with its provisions for flood control, irrigation, and power generation, will change the entire economic aspect of the Southwest.



Imperial Valley watermelons

The Water Supply On the Projects

A very light irrigation supply and serious crop damage are now certain on the Okanogan project in Washington, as storage on which the project is normally dependent after June 1 is now practically exhausted.

Light shortages of irrigation water will probably occur on the Milk River and Sun River projects in Montana, the Boise and Minidoka projects in Idaho, the Orland project in California, and the Salt River project in Arizona, with material crop damage avoidable by the efficient and economical use of available water.

On the Truckee lands of the Newlands project a moderate shortage of irrigation water will occur unless summer rains are received such as occur in occasional years.

By a praiseworthy combined effort of the contractor and the owners of American Falls Reservoir a considerable storage capacity was provided to catch waste waters in late spring, but unusually low run-off permitted only partial use thereof. For the benefit of irrigation, generally, in the Snake River Valley of eastern Idaho, storage interests in Jackson Lake extended a temporary storage privilege to the valley as a whole in order that waters which would otherwise be utilized at this time will later be available for maturing the more valuable crops. The anticipated result is an increase of several million dollars in crop values.

The value of Federal potato grades was found to be such that with the termination of the Food Administration the trade continued the voluntary use of the grades, and it is estimated that at least 80 per cent of the total shipments of potatoes in the United States are now quoted on the basis of the Federal grades.

President of Haiti Studies Reclamation

President Louis Borno of the Republic of Haiti, who is on an official visit to the United States, conferred with Secretary Work of the Interior Department on reclamation and irrigation problems on June 16.

Accompanied by his party, President Borno came to the Interior Department building at 9 a. m. and spent several hours obtaining information on the reclamation and irrigation activities of the American Government.

Reclamation Commissioner Elwood Mead took the Haitian President and his staff through the offices of the bureau.

Cooperative organizations are beginning to realize more than ever before that production and marketing are inseparable and that often the solution of a marketing problem may be found to originate in production practices.

COMPARATIVE COLLECTIONS, FEDERAL IRRIGATION PROJECTS

State	Project	Construction				Operation and maintenance			
		April, 1925	April, 1926	Fiscal year 1925 to Apr. 30, 1925	Fiscal year 1926 to Apr. 30, 1926	April, 1925	April, 1926	Fiscal year 1925 to Apr. 30, 1925	Fiscal year 1926 to Apr. 30, 1926
Arizona	Salt River			$599,326	$643,862				
Arizona-California	Yuma	$6,058	$6,033	349,376	340,212	$6,889	$6,024	$297,837	$222,356
California	Orland	4,802	3,178	33,342	79,499	733	1,300	25,727	34,157
Colorado	Grand Valley	(1)	(1)	(1)	(1)	10,380	8,488	42,661	52,300
	Uncompahgre	833	22,704	24,941	113,541	4,475	20,962	74,749	129,854
Idaho	King Hill							71	161
	Minidoka:								
	Gravity	1,886	32,199	60,311	133,230		19,756	12,639	31,407
	S. S. Pumping	508	1,898	30,359	70,754	197	1,170	36,186	47,670
	Jackson Lake			31,970	39,982	12,047	5,637	12,056	5,748
Idaho-Oregon	Boise	54,572	2,759	196,999	118,592	7,987	2,906	90,938	132,739
Montana	Huntley	230	1,632	17,125	23,146	1,141	2,255	26,912	30,866
	Milk River	(1)	(1)	(1)	(1)	185	1,814	13,748	16,019
	Sun River:								
	Fort Shaw	956	310	7,086	6,666	484	334	6,925	6,971
	Greenfields	(1)	(1)	(1)	(1)	84	903	10,816	13,540
Montana-North Dakota	Lower Yellowstone		2,298	3,350	12,847		6,999	5,221	17,603
Nebraska-Wyoming	North Platte:								
	Interstate	689	706	24,833	24,643	3,725	7,444	41,617	45,469
	Ft. Laramie	(1)	(1)	(1)	(1)	5,150		34,753	33,166
	Storage		3,131	31,989	20,290	5,769	1,544	12,633	4,558
	Northport							22,748	23,381
Nevada	Newlands	5,813	4,968	38,841	53,561	14,556	10,475	93,590	118,431
New Mexico	Carlsbad	207	1,723	66,520	46,636	328	1,240	63,838	36,472
New Mexico-Texas	Rio Grande	10,335	5,283	191,236	216,677		25,000	201,763	97,683
North Dakota	Williston					3,960		3,960	
Oregon	Umatilla		160	5,730	417		45	17,579	7,945
Oregon-California	Klamath	323	2,200	60,007	34,289	433	3,144	49,767	39,598
South Dakota	Belle Fourche								
Utah	Strawberry Valley	5,225	9,668	68,091	101,288	526	1,005	24,470	30,918
Washington	Okanogan		629	1,068	5,234		2,772	3,998	31,956
	Yakima:								
	Sunnyside	5,871	52,698	55,864	160,821	27,778	78,474	70,515	149,493
	Ticton	22,045	18,730	129,261	169,835	9,938	9,223	80,036	81,947
	Storage		2,300	25,435	82,975	1,698	890	20,577	17,886
Wyoming	Shoshone:								
	Garland	1,223	1,700	9,688	25,459	1,728	661	14,117	34,693
	Frannie	(1)	(1)	(1)	(1)	2,220	1,291	5,873	4,980
Total		121,576	176,907	2,062,748	2,524,436	122,411	221,756	1,418,320	1,499,967

[1] Projects on water rental basis.

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 — P. W. Dent, Assistant to the Commissioner — C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. N. McCulloch, Chief Clerk

George C. Kreutzer, Director of Reclamation Economics

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	J. B. Bond				
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	Ottamar Hamele	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	A. R. McGinness	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 F. 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.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	V. E. Hubbell	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	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg	H. M. Schilling	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.
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.
Umatilla, McKay Dam	McKay Dam, Oreg	R. M. Conner [6] Ralph Lowry [5]	C. B. Funk	W. S. Gillogly	B. E. Stoutemyer	Portland, Oreg.
Kittitas	Ellensburg, Wash	Walker R. Young [6]	E. R. Mills		do	Do.

[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
Sacramento Valley	Ellensburg, Wash	Walker R. Young	Sacramento Valley Development Association and State of California.
Dubois	American Falls, Idaho	F. A. Banks	Dubois Project Finance Association.
Spanish Springs storage	Fernley, Nev	A. W. Walker	
Harney Valley	Boise, Idaho	R. J. Newell	
Owyhee	do	do	
Vale	do	do	
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	State of Utah.
North Platte (Casper) pumping	Guernsey, Wyo	F. F. Smith	State of Wyoming.
Heart River	Denver, Colo	G. E. Stratton	

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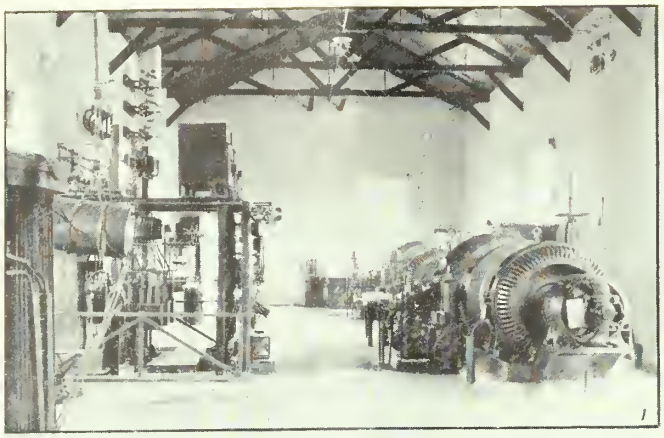
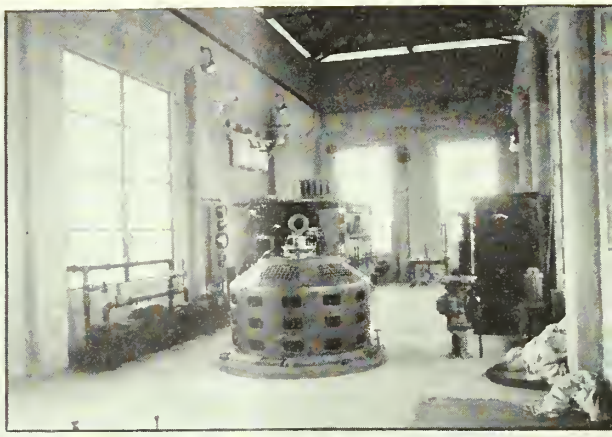
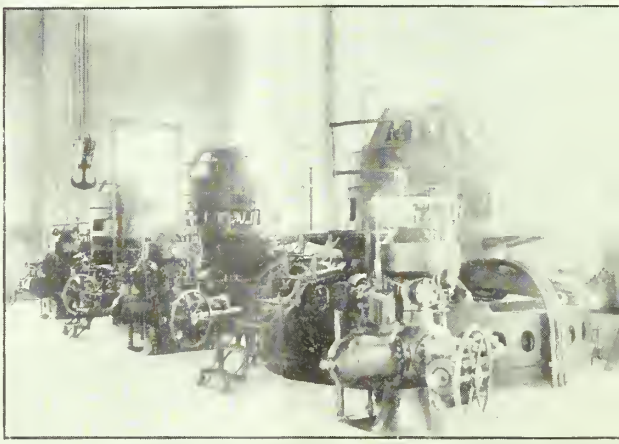
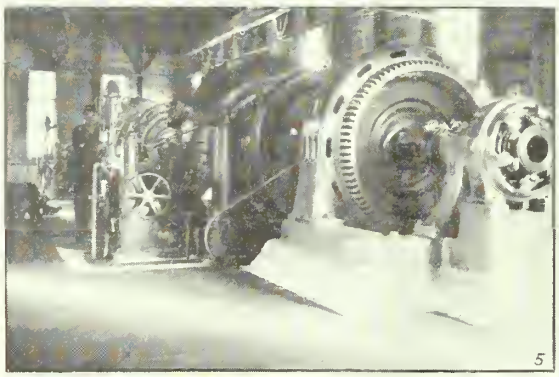








DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

1. INTERIOR OF POWER PLANT ON INTER-
STATE CANAL, NORTH PLATTE PROJECT
NEBRASKA-WYOMING

2. INTERIOR POWER PLANT, [illegible]
YUMA NO. 1, YUMA PROJECT, [illegible]

3. [illegible] DAM AND [illegible]
[illegible] PROJECT

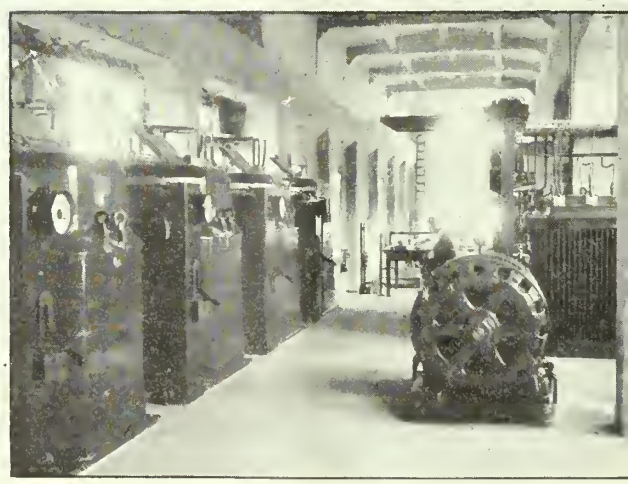
4. [illegible]

5. INTERIOR POWER HOUSE, NO. 2
[illegible]

6. MINIDOKA POWER H[illegible]

7. INTERIOR MINIDOKA P. W. H[illegible]

8. [illegible] ELECTRIC PUMPING PLANT
MINIDOKA PROJECT, IDAHO



HYDROELECTRIC POWER PLANTS ON THE IRRIGATION PROJECTS OF THE BUREAU OF RECLAMATION

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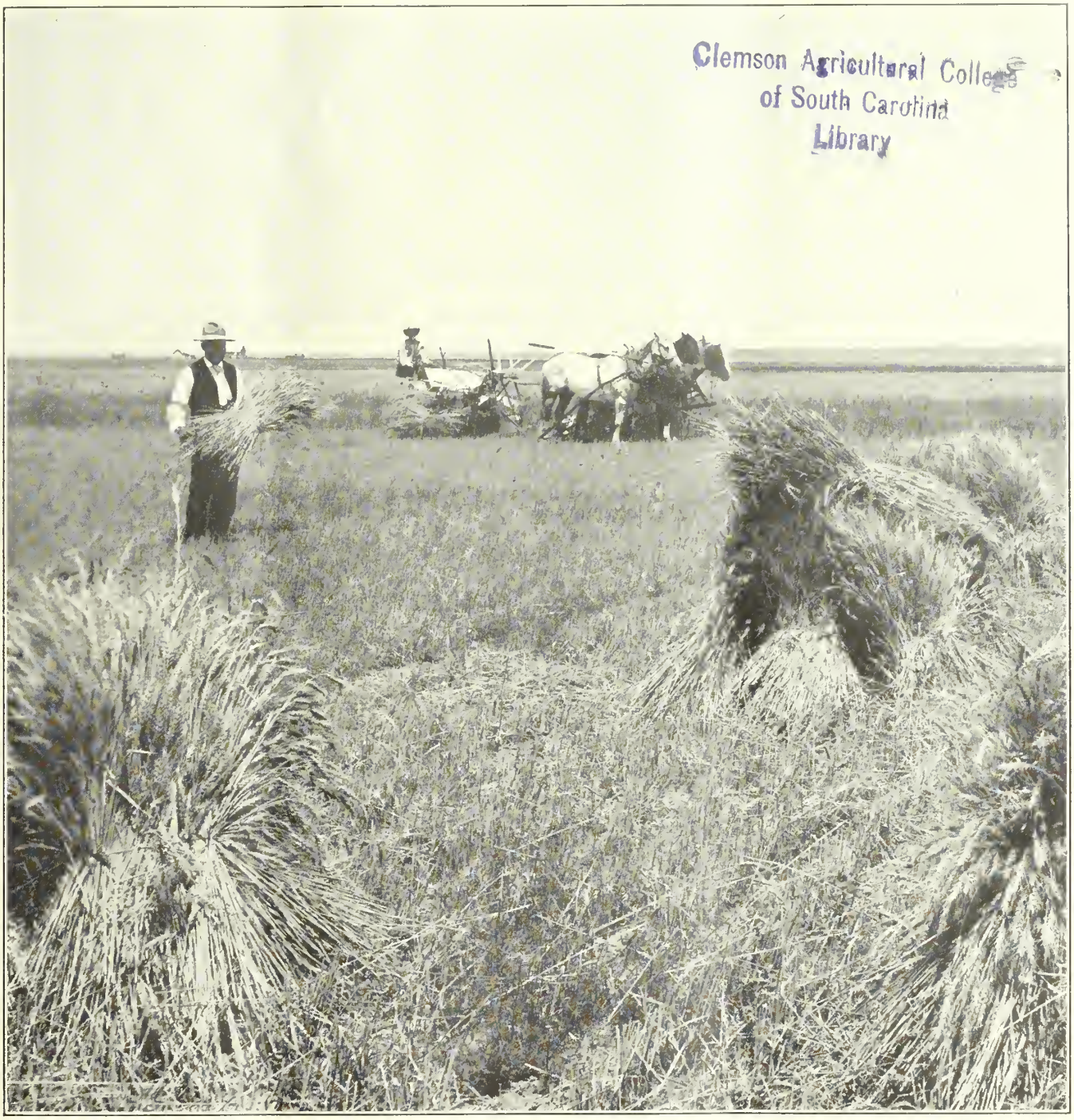
NEW RECLAMATION ERA

VOL. 17 AUGUST, 1926 NO. 8



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HARVESTING THE GOLDEN GRAIN ON A FEDERAL IRRIGATION PROJECT

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HAS RESULTED IN
TRANSFORMING
THE DESERT

INTO AN
IRRIGATED
GARDEN

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. 17 AUGUST, 1926 No. 8

Interesting High Lights on the Reclamation Projects

SHIPMENTS of agricultural products from the Yuma project during June amounted to 322 carloads valued at $132,850. Since the beginning of the year the total value of such shipments has amounted to $1,493,050. In addition, there have been numerous express shipments of garden truck, grapes, etc.

ON the Uncompahgre project 940 of the 1,028 delinquent accounts have been cleared for water for the irrigation season by the payment of delinquent charges. About 97 per cent of the lands which received water during 1925 are cleared for water for 1926.

A CLOUDBURST on the drainage area of Dunlap Creek, Lower Yellowstone project, did considerable damage to the paving below Dunlap Creek conduit. Permanent repairs, estimated to cost $4,000, have been approved.

AT Guernsey Dam, North Platte project, 59,781 cubic yards of gravel and puddle material were placed in the dam section during June, and at the end of the month the gravel fill portion was approximately 59 per cent complete. Based on gross contract earnings, the dam was 62.9 per cent completed at the end of the month.

A LARGE meteor struck the side of a mountain recently near Sand Springs, 30 miles east of Fallon, Newlands project, tearing away a large quantity of rock amid great clouds of dust. Several days prior, another brilliant meteor traveled over the project, apparently striking the earth somewhere to the north. This meteor was accompanied by loud and prolonged rumbling which awakened project residents about 2 a. m. Many thought that a powder magazine had exploded somewhere on the project.

JACK rabbits have been invading the irrigated lands on the Minidoka project, causing a great deal of damage to crops. A number of drives have been made at which several thousand rabbits were killed, but the best results seem to be obtained through poisoning. One farmer reported a count of 650 rabbits killed with one ounce of strychnine.

AT American Falls Dam, the concrete was brought up to the crest in the spillway section. About 16,700 cubic yards of concrete were poured during June. Good progress was made in the construction of the right embankment, more than 10,000 cubic yards of earth being placed, sprinkled, and rolled.

THE widespread reputation of "Fallon turkeys" from the Newlands project among the elite dining-car and hotel trade has been gained by local methods of growing and feeding which produce prime birds. From the time they are a month old until ready for market the birds are put on full feed, consisting largely of skimmed milk, augmented by grain ration during the latter part of the fattening period.

TWO hail storms, one at the upper Otis district and one in the lower Loving district, Carlsbad project, damaged, more or less, about a thousand acres of cotton recently. On some of the fields growth was delayed and crops set back for a few weeks, and in a limited area crops were wiped out altogether and had to be replanted.

THE Powell Creamery, Shoshone project, had the best month in its history recently. It bought 15,600 pounds of butterfat, and manufactured 18,500 pounds of butter and 700 gallons of ice cream. Other agencies purchased 4,100 pounds of butterfat, the price of which was 33 cents a pound in sour cream and 50 cents a pound in sweet cream.

THE recently organized Churchill Poultrymen, (Inc.), on the Newlands project, continue to ship eggs to the Los Angeles market by refrigerator freight with satisfactory results. The association is also endeavoring to assemble broilers and fryers in carload lots for the same market. The 1926 turkey crop promises to be the largest in the history of the project.

RECENT development on the projects includes a $200,000 hotel at Yuma, to be opened in the fall; a new school at Las Cruces, and a new church and a public school at Hatch, Rio Grande project. The city of Klamath Falls has voted a $62,000 bond issue to provide funds for one-half the cost of a viaduct over the Southern Pacific Railroad yards. This also fulfills an agreement whereby the Southern Pacific Co. is to construct yards and shops estimated at cost $800,000.

A RECENT survey of registered and grade bulls on the Newlands project shows that 66.7 per cent of all dairy herds of more than five cows are headed by purebred sires.

AT McKay Dam, Unatilla project, all work on the spillway had been completed at the end of June with the exception of the installation of the hoisting mechanism. Work on placing the concrete paving on the upstream face of the dam has continued without interruption.

LISTING of unoccupied land and tracts held by nonresidents on the Belle Fourche project is progressing, and recently sale terms had been filed on 135 farms covering 11,000 irrigable acres.

SETTLEMENT opportunities on the Belle Fourche, Lower Yellowstone, and Riverton projects are being featured by means of an automatic film slide delineascope at the Sesquicentennial International Exposition at Philadelphia.

2374—26——1

Construction of Kittitas Division, Yakima Project, Washington

The first of a series of articles describing and analyzing the plans and conditions under which the Department of the Interior is to develop the new projects for which money was appropriated by the 69th Congress

ENGINEERING FEATURES

ON the Kittitas division of the Yakima project, in the State of Washington, works will be constructed for the irrigation of about 72,000 acres of land. The main body of irrigable land lies in the vicinity of the town of Ellensburg, which is on the Yakima River and not far from the geographical center of the State of Washington.

From an engineering and construction standpoint, the project is a comparatively simple one, involving very few unusual features. The irrigation plan contemplates the diversion of water from the Yakima River just above the town of Easton into a main canal on the southerly side of the river. Water for irrigation will be supplied from the natural flow of the Yakima River and from the reservoirs that are already built and operated by the Bureau of Reclamation at Kachess and Keechelus Lakes. No new storage reservoirs are to be constructed in the work now beginning.

THE DAM

The diversion dam will be located in a narrow, boxlike canyon, out of which it will raise the water about 43 feet above low-water stage into the intake of the main canal on the adjoining bench. The site is very favorable for an economical structure. Solid rock is exposed on both abutments and in the river bed, and the main lines of two transcontinental railroads pass the site. The dam will be a straight, gravity type, concrete structure about 65 feet in height above the stream bed, and 248 feet in overall length along the crest, including the canal heading. A single, floating, drum-type gate 64 feet long by 14.5 feet high will be mounted on top of the dam in its central part and will automatically control the water level above the dam, passing, when wide open, a flood of 13,000 second-feet. Two 4.8 by 6 foot sluice gates will also be installed through the dam near the river bed. A fish ladder will be provided in the left abutment, and the intake to the main canal, controlled by two 12 by 11 foot radial gates, will be placed in the right abutment.

THE MAIN CANAL

The main canal will flow in a general southeasterly direction parallel to the Yakima River and on the southerly side thereof for a distance of about 26 miles, dividing at this point into two main branches. The larger, or North Branch, which will be 52 miles in length, will immediately cross the Yakima River and flow in an easterly direction, thence swinging south, and finally turning and flowing westerly to a point near the Yakima River, nearly encircling the Kittitas Valley, in the center of which is the town of Ellensburg. The smaller, or South Branch Canal, 14 miles in length, will remain on the south side of the river and flow in a southerly direction, covering the lands lying west of the river. The main body of the project is 28 miles long and 12 miles in width.

The main canal will have a capacity at its upper end of 1,320 second-feet. Its cross section in earth will be 30 feet wide on the bottom and 79 feet wide on top, with a water depth of 11.35 feet. A large portion of the canal will be lined with concrete, and for this construction the bottom width will be decreased to 12 feet and the water depth to 9.75 feet.

The valley of the Yakima River within the area traversed by the main canal is narrow, with precipitous ranges of hills on each side. At the upper end these hills are largely wooded, but the woods gradually give way to open bunch-grass and sagebrush country toward the lower end. The canal leaves the narrow bench adjacent to the river within a short distance from the diversion dam, gradually climbs the adjoining hills and follows these comparatively steep slopes in a tortuous course throughout its length. At its lower end the main canal is about 400 feet in elevation above the river.

The main canal will cross several small streams in canyons of considerable size. These streams will in general be crossed by inverted siphons and these will form the principal structures. There will be 10 such siphons, in general about 12 feet in diameter and of reinforced monolithic concrete construction. The hydrostatic head on these siphons will range up to a maximum of about 245 feet, and for the higher heads riveted steel pipes will be used instead of concrete. Other important structures on the main canal will be the crossings under the Northern Pacific and the Chicago, Milwaukee & St. Paul Railway tracks and four wasteways, to discharge water back into the river, located at approximately uniform intervals along the canal. The main canal will also include one short tunnel through a rocky point and possibly one reach of concrete bench flume about 2,400 feet long. Of the 26.2 miles of main canal, about 14.8 miles will be concrete lined, 9.4 miles will be unlined earth section, and the remaining 2 miles will be taken up by the structures.

CANALS AND SIPHON

The outstanding feature of the North Branch Canal and the most extensive single structure on the entire project is the siphon carrying this canal across the Yakima River. The plans for this structure provide for a riveted steel pipe supported on concrete piers and carried across the main river channel on a high steel bridge. The pipe will have a maximum diameter of 12 feet; will operate under a maximum hydrostatic hea of 300 feet, and will be about 1 mile long. The intake and outlet structures will be of concrete.

Leaving the Yakima River siphon, the North Branch Canal traverses the north and east side of the valley a distance of 35.7 miles to Wippel Creek, where a drop and pumping station are proposed, and beyond this point three branches are carried around a small valley called Badger Pocket. At the Wippel Creek drop a direct-connected turbine and pumping plant are planned to lift water about 130 feet and irrigate 2,500 acres of land above the gravity canal. The static head on the pumping plant will be 82 feet. Beyond the pumping station the power water will be used for the irrigation of the lower lands in Badger Pocket and along the south side of the valley to the river where a terminal waste ditch will discharge.

Of the 35.7 miles of the North Branch Canal above Wippel Creek, 25.1 miles will be unlined earth section; 6.3 miles will be concrete lined, and the remaining 4.3 miles will be taken up in structures, including 4 tunnels, 1 bench flume, and 7 siphons. Wasteways are planned at Caribou, Johnson, and Badger Creeks, which, together with the long waste channels required, constitute structures of considerable magnitude.

The South Branch Canal will follow along the foothills of the southwest side of the valley from the point of division to Manastash Creek. Of the 14.2 miles of this canal, 11.2 miles will be unlined earth section, 1.1 miles will be concrete lined, and the remaining 1.9 miles will include 1 elevated flume, 1 tunnel, and 2 siphons.

Detail plans and location have not yet been worked out for the distribution system which will deliver water to the indi-

vidual farm units. This system will be constructed in accordance with the standards of the Reclamation Bureau and the usual types of structures will be provided. The distribution system will not require any laterals of considerable size other than the two main branch canals already described.

Permanent improvements for operating purposes, consisting of headquarters building and grounds, 14 patrol houses, gate tender's house at the diversion dam, and the operator's house at Wippel pumping plant, are contemplated. A telephone system, comprising an aggregate of 100 miles of line, is also provided for in the estimates.

DRAINAGE

It is estimated that eventually an area of about 7,000 acres of the irrigable lands will need drainage. The natural drainage courses that traverse the irrigable area are shallow, and these will probably have to be deepened and improved to care for the increased run-off due to irrigation. These improved natural channels will also probably have to be supplemented by lateral drains and structures. It is not contemplated that any of this work will be done until the need arises, as it will not be practicable to properly locate and design the drainage works until seepage conditions develop.

It is planned that the irrigation system and structures will be of the most substantial and permanent nature. Canals will be largely lined with reinforced concrete and substantial reinforced-concrete construction will predominate in the structure work. The estimated cost for surveys and construction, exclusive of storage facilities already provided, is approximately $9,000,000, of which over 80 per cent will be required for the canal system. The main canal and diversion works are estimated to cost over $3,000,000, and the funds now appropriated will be expended mainly on these features.

CONSTRUCTION BY CONTRACT

Construction will be undertaken in convenient and economical units and will be performed under contracts awarded under competitive bidding. Contract for the first division of the main canal, including about 4 miles, has already been awarded, and the work is now under way. The second division, including about 10 miles of the main canal, will be advertised in the near future, and bids will be invited on additional work as soon as final location surveys, designs, and specifications can be completed. The rate at which the work will be prosecuted will depend on the funds available. The engineering and construction work is under the direction of the chief engineer, with headquarters at Denver, Colo., who is represented on the work by a construction engineer, with headquarters at Ellensburg, Wash.

THE CONTRACT

February 16, 1921, the Kittitas reclamation district entered into a contract with the United States for the purchase of 260,000 acre-feet of water per annum for which payment is to be made in 40 semiannual installments. The exact amount to be paid was left for later determination, but the probable cost was stated in the contract as $1,710,000. The first 8 of the semiannual installments was each to be 1 per cent, the next 4 each 2 per cent, and the next 28 each 3 per cent, of the total cost. The theory of this contract was that the district was to construct its own diversion dam and distribution system, the United States furnishing merely the reservoirs and water supply from the Yakima project.

The district being unable to finance the construction of its diversion dam and distribution system, the contract of December 19, 1925, with the United States provides that the Government will expend not to exceed $9,000,000 for the construction of a diversion dam in Yakima River, in sec. 11, T. 20 N., R. 13 E., Willamette meridian, and a canal system extending therefrom, the canal system to consist of a main canal and branch canals and structures in connection therewith. Such distribution system is to be constructed as the Secretary finds to be necessary and capable of construction within the limit of expenditures indicated.

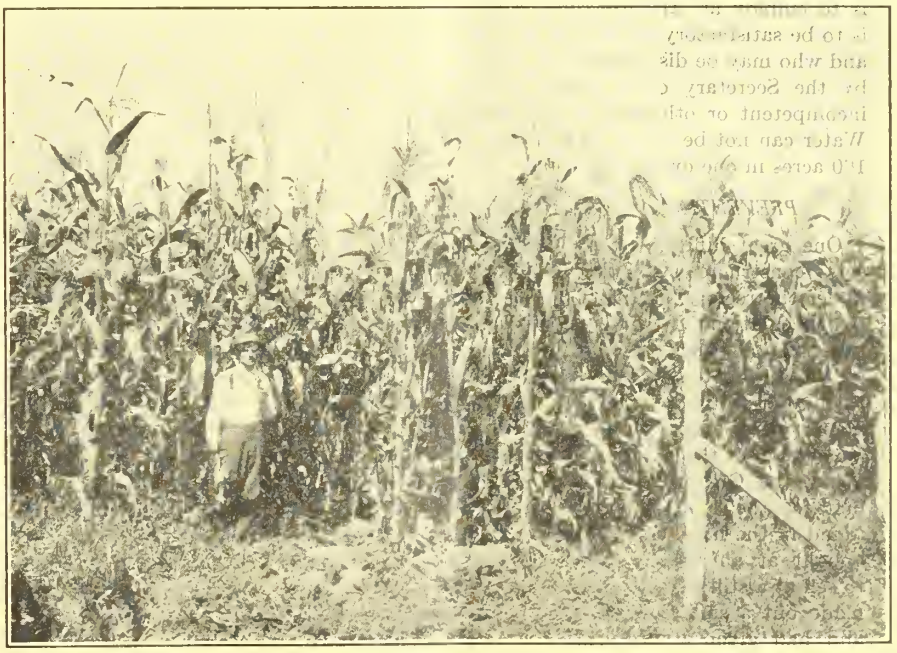
The contract makes performance by the United States contingent upon Congress appropriating the necessary funds from year to year to carry out the program. The United States is to utilize in the construction of canals any right of way it may have reserved in patents issued under the act of Congress of August 30, 1890 (26 Stat., 391). Any other right of way needed is to be obtained by the district by purchase or condemnation, although the cost of same is to be paid by the United States.

ISSUANCE OF PUBLIC NOTICES

As required by the law the Secretary is to issue two public notices relative to the construction charges. The first public notice is to be issued when the land is ready for settlement and will announce the construction charge per irrigable acre. The second public notice is to be issued when in the opinion of the Secretary the agricultural development of the lands shall have advanced sufficiently to warrant the commencement of the payment of installments of the construction charge. The second public notice will fix the date when payments will begin on the construction charge announced by the first public notice, but this date can not be more than five years later than the date of the first public notice.

The annual payments are to be based on the productive power of the land. Each installment is to be 5 per cent of the average gross annual acre income for the 10 calendar years first preceding

(Continued on p. 132)



A cornfield in the Yakima Valley, Wash.

The Kittitas Contract and Provisions for Settlement Promotion

The contract of December 19, 1925, provides that the Government will expend not to exceed $9,000,000 for the construction of a diversion dam in Yakima River and a canal system extending therefrom—Settlement plans

(Continued from p. 131)

or for all years of record if fewer than 10 years' record is available, of the area in cultivation.

After the completion of the construction program, the district is to operate and maintain the irrigation works. The United States is to have the right to inspect the works and to require the district to make needed repairs, or the United States may make such repairs and charge the cost to the district.

ASSESSMENTS FOR PAYMENTS

The district is to levy assessments or taxes upon the land in the district in order to raise the money needed to make these payments to the United States. The district is obligated to make the payments, notwithstanding the default of some of the landowners in meeting their assessments. The Government may refuse to deliver water to the district if it defaults for a period of more than one year in any payment due to the United States under the contract. Or, if the Government prefers, it may reduce the amount of water delivered proportionately, and the district is then to refuse to deliver water to landowners who are more than one year in default in the payment of any of their water charges.

In order to protect the United States during the period when the construction charges are not paid in full, the district is to employ an irrigation manager who is to be satisfactory to the United States, and who may be discharged if he is found by the Secretary of the Interior to be incompetent or otherwise unsatisfactory. Water can not be delivered to more than 160 acres in one ownership.

PREVENTING SPECULATION

One great difficulty with all old projects constructed by the Government under the reclamation laws has been due to speculation. The land during the construction period came into the hands of those who did not desire to farm it themselves, but to sell it to others at boom prices, owing to the expectation of benefits from the expected water supply. When the Government's debt began to mature, the land was very frequently found in the hands of an owner who had bought at an enhanced price expecting to sell at a still higher price, and who had made but a small payment for the land and had given a mortgage for the remainder. Since this transaction was based upon an inflated valuation of the land, and since the landowner was faced by an indebtedness both for the land (usually with a high-interest rate on deferred payments) and for the water, he was often doomed to fail.

In the endeavor to prevent the land values from being inflated in this way, the contract provides for an appraisal of the land by a board of three appraisers, one appointed by the Secretary of the Interior, one by the district, and these two to select a third member. They are to appraise all of the district lands, without regard to the prospective water right. If lands are later improved by the erection of buildings, etc., the added improvements may be appraised at the expense of the landowner. When land in the district is sold the vendor and vendee are to report the facts of the sale to the district and land is to have no right to receive water from the project works unless such report is made.

If any land after the appraisal is sold at a price in excess of the value fixed in the appraisal, plus any water-right payments made, one-half of such excess is to be paid to the district and is to be applicable upon the water-right charges. This is based upon the just theory that the project expenditure was responsible for such enhancement in value, and therefore the project should share in the profit arising from the sale of the land. The provision will undoubtedly have a tendeney to prevent a runaway boom in land values such as crippled some of the older projects for a considerable period.

The contract provides for its confirmation by the court, as permitted by the Washington statutes, and such confirmation decree has been entered.

PROMOTION OF SETTLEMENT

The foregoing contract is accompanied by a contract dated Deeember 19, 1925, between the United States and the State of Washington by which the State assumes the duty and responsibility of promoting the development and settlement of the Kittitas division after completion, including the subdivision of lands held in private ownership by any individual in excess of 160 irrigable acres, and the securing, selection, and financing of settlers to enable them to purchase the required livestock, equipment, and supplies and to improve the lands so as to render them habitable and productive. The State is to provide funds necessary for the purpose, but not in excess of $300,000.

LOCATION AND AGRICULTURE

The arable land of the Kittitas Valley is in the upper reaches of the Yakima River watershed, in the State of Washington, and has an elevation of from 1,700 to 2,100 feet. A portion of the floor of this valley has been irrigated for many years, which provides ample demonstration of the character of agriculture, which should be followed on the new land to be brought under irrigation by the works to be constructed by the United States. The land to be irrigated by the new works lies around the present irrigated area in the form of a horseshoe. The natural conditions of soil and climate support a diversified agriculture. Small grains, alfalfa, clover, timothy, potatoes, and, in fact, all crops common to the temperate zone produce profitably. In favored locations apples and cherries are grown commercially. There is probably no section of this country which produces higher yields of wheat and oats when these crops are irrigated.

The division includes approximately 70,000 acres of irrigable land. Of this, about 60,000 acres are owned by private individuals in tracts varying in size from 20 acres to 800 aeres. A few tracts are owned in area in excess of the latter figure. The Northern Pacific Railway owns about 3,900 acres, the State of Washington about 1,400 acres, and 5,000 acres are public land. The railroad and public land and the land owned by the State of Washington are covered with sage brush and are located at what is known as Badger Poeket, which is the most remote from towns and transportation. When all of this land, including the subdivision of areas held in excess of 160 acres, is settled, it will make homes for approximately 500 additional families.

THE FARM UNITS

In arranging the farm unit subdivisions of the public lands, the allotment of irrigable areas and the location of boundaries will be governed largely by the quality of the soil, the topography of the land, and the location of natural barriers. This general plan will enable the settlers to choose loeations best fitted to the individual desires and farming plans; it will obviate many expensive construction items in building distributaries; it will secure a more nearly compaet arrangement of the cultivable area with minimum outlay for bridges and works necessary

to overcome natural barriers and provide an approach to a greater equalization of opportunities.

An appraisal committee, composed of one member representing the Secretary of the Interior, one the irrigation district, and a third selected by the first two named, has been engaged for several months in fixing the values of the land without respect to the construction of the proposed irrigation works. These values will be the basis of future sales of land and the appraisal is for the purpose of eliminating speculation, which has been one of the evils of reclamation in the past. This committee has taken into consideration the quality of the soil, the topography (which indicates the cost and difficulties encountered in preparing land for irrigation), and the nature and value of improvements, if any, on the various tracts. This appraisement thus becomes an inventory of the value of the project in its undeveloped state and an index to its productive power under irrigation.

It was realized that the benefits to come from this development and the prompt repayment of project costs will be greatly influenced by the measures taken to secure settlers. It is probable that the privately owned partially improved land can be settled by the landowners themselves, with the assistance of the Chamber of Commerce of Ellensburg, Wash., and other related and interested agencies. This is not true on the railroad, State, and public land. The land has an irregular surface, is covered with sage brush, and farms must be built up from the beginning.

The Water Supply On the Projects

Flow of all the streams from which the projects obtain their water supplies remained low throughout the States of Utah, Idaho, Washington, Oregon, California, and Nevada. Serious crop damage will probably result on the Okanogan project in Washington. Light shortages may occur on the Boise, Minidoka, Milk River, Yakima, and Orland projects. Pumping from the Lahontan Reservoir on the Newlands project was being resorted to in order to avert a serious shortage on the Truckee lands.

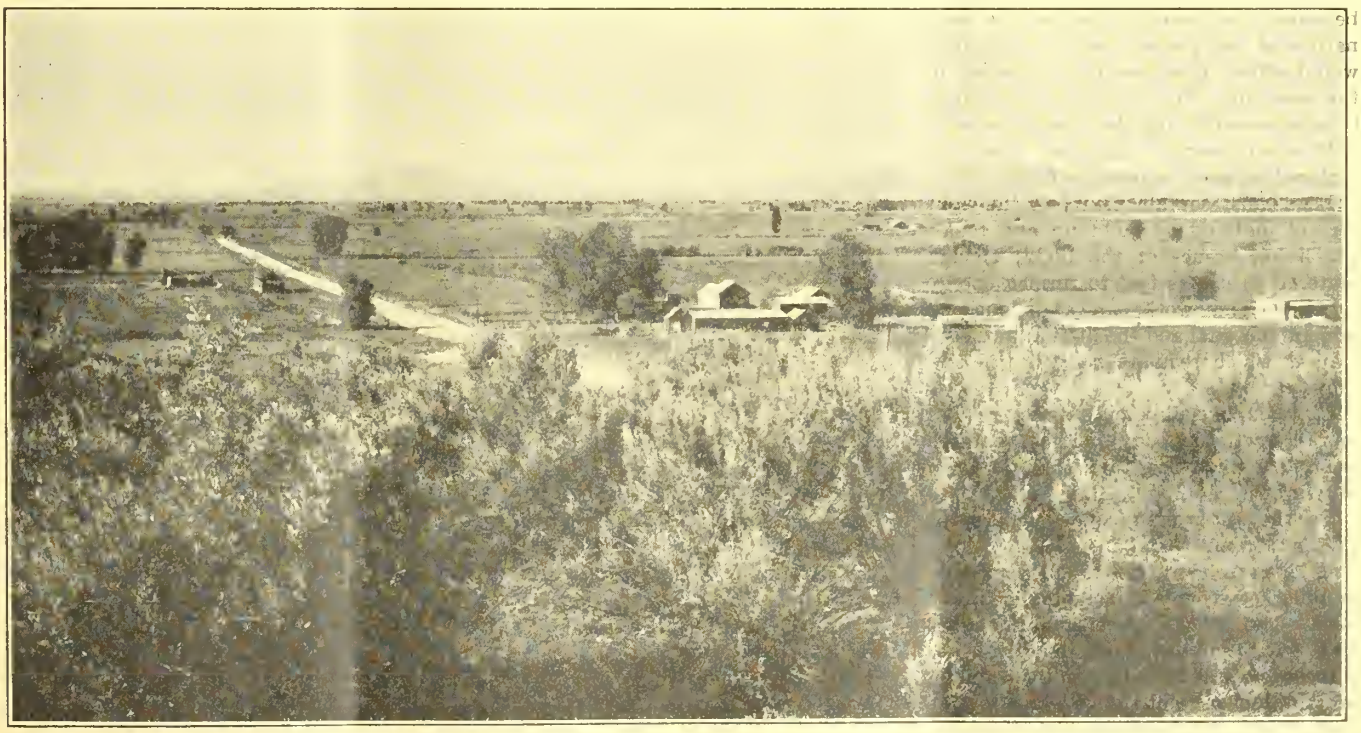
Heavy rains have relieved the situation on the Milk River and Sun River projects in Montana. The Grand Valley and Uncompahgre projects have a normal water supply, and conditions on the Colorado River have improved.

The supply for the Belle Fourche and North Platte projects continues above normal, and conditions continue favorable in New Mexico.

CAPITAL REQUIREMENTS OF SETTLERS

The farmers who take this unimproved land will have to spend money or the equivalent of it to the extent of $5,000 to $7,000 on 60 or 80 acres to bring it into profitable production. This is needed to clear, level, and prepare land for irrigation. It is needed to assist in the erection of houses and barns, and other improvements, and to completely equip the farm with livestock and modern tools and implements. It is not expected that settlers can be secured who have that much capital. Past experience indicates that few settlers will have enough to completely develop their farms. Settlers who have from $1,500 to $3,000 must be encouraged to settle at Kittitas. Because this was realized from the beginning, the State of Washington entered into a contract with the United States to secure settlers for this division, and agrees to assist these settlers to become established. It was estimated that $300,000 would be needed to settle the raw land at and adjacent to Badger Pocket. The business men and landowners of the Kittitas Valley have organized a corporation which it is understood will relieve the State of this responsibility.

With this corporation functioning to secure and assist settlers, and the fixing of land prices based on its productivity, should come hastened development and complete settlement much earlier than otherwise would be the case.



Where desert and garden meet

Project Women and Their Influence in the Home and on Farm Life

Economists are unanimous in stressing the important place occupied by women in rural life, and the value of their work in making homes out of mere dwelling places and in building up the morale of a community

By Mae A. Schnurr, secretary to the commissioner and associate editor, New Reclamation Era

School Bound

WHEN this issue reaches the farms on our projects, the young folks will be busy getting ready to return to school.

Through the splendid initiative of the pioneers the foundation has been laid for good school facilities, and expansion is going on by leaps and bounds. This is a matter justly to be proud of. Each school is a monument to "Progressive America." Some of the school buildings erected are palatial affairs, like the one shown above, and the fact that these were made possible by taxation in the different States in which they are located shows farsightedness on the subject of making available to everyone educational facilities of the highest type.

Our people do not stop at putting up the necessary buildings, providing the best teachers, and inviting young America to come to be taught; they actually provide transportation to and from school. The best of treatment is none too good for them. One of the horse-drawn vehicles used on the Minidoka project is shown in the picture. These have been replaced by motor busses in many cases.

The summer vacation has undoubtedly benefited the young folks as the very nature of the project family's activities would afford good healthful exercise in the open air. Very little mental fatigue is experienced during the recess of school.

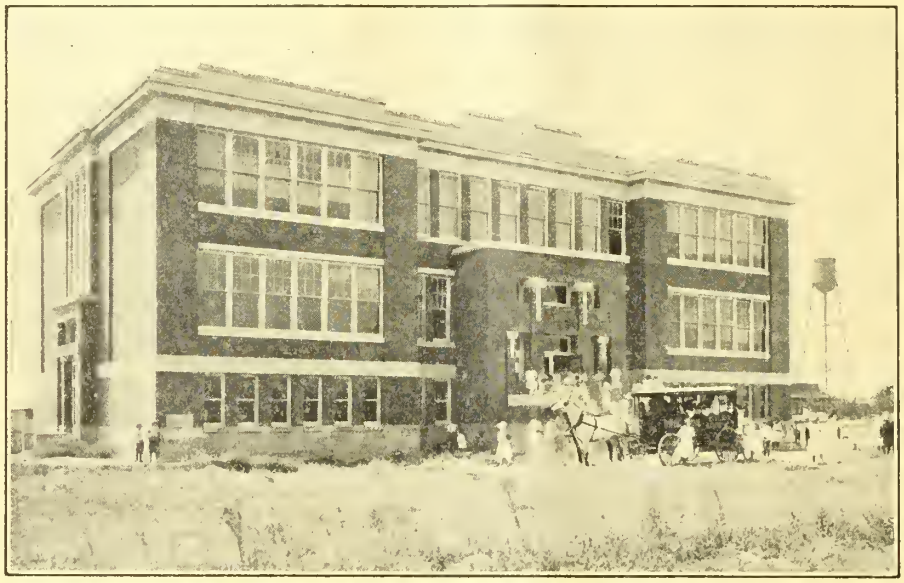
Physical energy expended must be replaced by good wholesome food.

Food must contain plenty of the right sort of material to build up and repair the living tissues of the body; enough material to use as fuel to furnish energy for heat and work, an abundance of mineral material and the little known substances which regulate body health and growth.

Children, like all young animals, require more growth or body-building material relative to their size than they do when fully grown.

For the best growth and development, a child's food must contain:

1. ANIMAL PROTEIN—found especially in milk, eggs, meat, including fish and fowl. The protein of certain vegetables and nuts contains body-building substances and will do to help out the animal protein, but will not suffice alone, for the best growth and development of the average child.



Where some of the Minidoka project children go to school

2. MINERAL MATTER—needed in the growth and functioning of the parts of the body, such as the skeleton, the blood, the brain, etc. The chief sources of these minerals are milk, eggs, meat, green vegetables, and fruits.

3. THE SUBSTANCES REGULATING GROWTH—found especially in the fat of milk, eggs, leaf vegetables, but not found in vegetable oils or pork fat.

Whole milk contains an abundance of animal protein, minerals, and the growth-regulating substances, besides fat and sugar. No other single foodstuff is therefore so important in infancy and childhood.

INDISPENSABLE ARTICLES OF FOOD IN CHILDHOOD

1. Whole milk or skim milk with butter.
2. Butter.
3. Green vegetables, especially leaf vegetables.
4. Starchy foods, which are the principal sources of energy but are not growth foods.

To these four essentials it is desirable to add:

5. Some eggs or meat, including fish and fowl.
6. Sugar.
7. Fruits.

Choose easily digested food for the child and see that it is properly cooked.

MEALS FOR THE PRESCHOOL CHILD

By the end of the first year, a child should have four meals a day. By the end of the second year three meals a day are sufficient for the average child.

"PLENTY AT MEAL TIME AND NOTHING BETWEEN MEALS"

A baby at 1 year may take a quart of milk a day. After this age, as he takes more cereal and bread with egg and vegetables, reduce the milk to three cups a day. A child will take more food if he drinks most of the milk at the end instead of at the beginning of the meal.

Cereals, bread, potato, and rice are the starchy foods—the fuel foods—and should be part of every meal. Cooked cereals are best for children. Victory bread, thoroughly dried in the oven, can be used from infancy on. The child needs an abundance of fuel food as well as growth food.

Green vegetables—spinach, chard, beet greens, beets, carrots, onions, string beans, celery, asparagus—should appear in the diet by the end of the first year. These vegetables should be first used in strained soup or broth, then as purees and by the end of the second year mashed or finely divided. Peas, beans (other than string beans), and corn should not be given to

Women on the Projects and Their Relation to Better Agriculture

The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life

very young children except as purees. Cauliflower and cabbage may be given to older children.

Children crave sweets, and they should be given these, especially in the noon dessert, as simple puddings, custards, home-made ice cream, fruit, jellies, or simple candy. Sweets between meals mean bad teeth and bad " tummies."

Fruits should appear daily in the diet of the child, fruit juices for the baby, stewed apples, or prune pulp later in infancy. Raw apple (at first scraped), oranges, ripe peaches, and any cooked fruit may be given to the older child. Bananas are not fit food for a child to eat unless the skin is brown or the banana is cooked.

RIGHT SORT OF FOOD AT THE RIGHT TIME

A young child should have the principal meal at noon, including a vegetable and meat soup, or an egg, or meat (including fish and fowl), with a green vegetable, and starchy vegetable or cereal. Cereal and milk with cooked fruit make the best supper and breakfast.

Feed the child in this manner in preschool years and you will lay the foundation for a well-developed, healthy pupil. Take the precaution before the child enters on its first year at school to see that it has had a general medical examination, defective sight corrected by glasses, hearing and speech by treatment. It will mean the difference between a dull and a bright child.

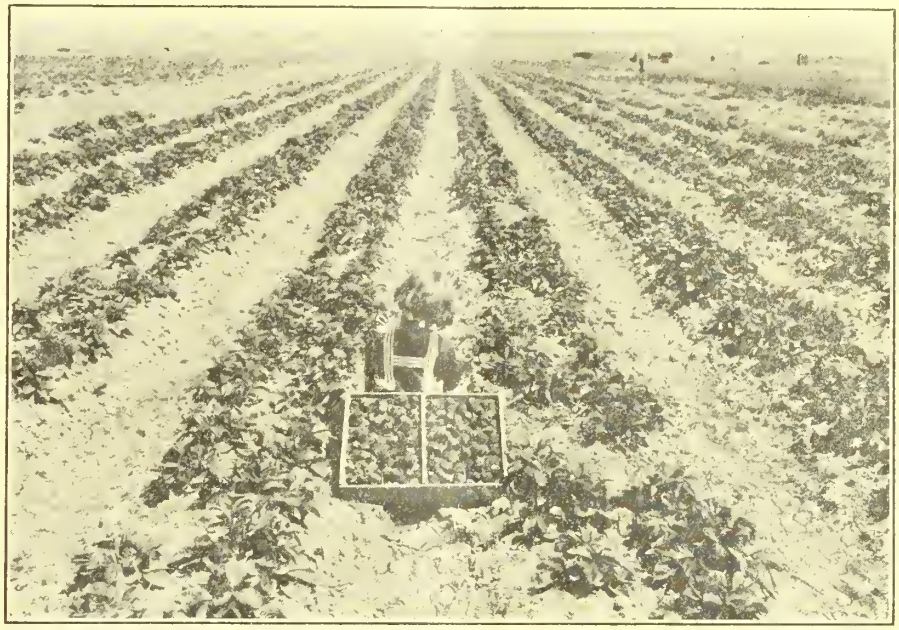
Project Women's Caches

Ask the housewife about her home and among the things she will speak about with pride will be her closets. The more she has of them the better she likes it.

CLOTHES CLOSET

This may be of good serviceable size but if not properly arranged will miss its very purpose. By all means install a horizontal rod (preferably round) on which each garment may be hung on an individual hanger. It is surprising how many garments may be accommodated, and an added advantage of this arrangement is its neat appearance.

On the inside of the door of the closet tack a holder for bedroom slippers. Attractive ones may be made of cretonne—just a straight piece turned up and sewed off into pockets.



Imperial Valley strawberries—money-makers

LINEN CLOSET

"A place for everything and everything in its place" is a particularly fitting remark for this treasure chest. The convenience of the family is involved as well as the earmarks of a good housewife. After the linen closet is once established it is a very easy matter to maintain in order. Only the woman who enjoys one can tell you what pleasure it is to carry the week's laundry to the closet and distribute bedding, towels, wash cloths, etc., each in its own place.

Try These

Miss R. C. Watkins, of the Washington office force, offers the following for a trial in project homes:

ORANGE MARMALADE

2 good-size oranges.
2 good-size lemons.
12 cups of water.
4 pounds of sugar.

Run oranges and lemons through chopper. Add water and let boil one hour. Then add sugar and boil until jellied—about one hour. (Makes 7 glasses.)

OLD FASHIONED "MOTHER'S" CAKE

1 cup of butter.
2 cups of sugar.
3 cups of flour (sifted).
1 cup of milk.
5 eggs.
1 teaspoonful of yeast powder.
1 teaspoonful nutmeg (or other flavoring).
¼ teaspoonful salt.

Cream butter and sugar, beating until very light. Add sugar, and cream again. Beat separately yolks of eggs and whites of 3 eggs. Add to butter, and cream again. Add milk, flour, salt, yeast powder, and flavoring.

ICING

Whites of 2 eggs (remaining from above).
2 cups of sugar.
⅔ cup of water.

Boil sugar and water until if forms a ball in cold water. Beat whites of eggs very stiff and to these add the boiled sugar. Beat until cool. Add lemon (or other flavoring).

Wanted

A good, tried recipe for preserved watermelon rind.

Household Hints

Tablecloths and napkins will last longer if when ironed they are folded in three parts one week and four the next ironing.

To clean a chamois, soak thoroughly in warm water, spread over a smooth hard surface, and rub a good "scrubbing soap" over its surface from the center to the edges and see the dirt rub out.

Rub soap under the finger nails before blacking the stove and none of the blacking will work under the nails.

If a drawer runs unevenly and causes trouble in opening and shutting, it is not always necessary to have recourse to the carpenter. Frequently the very simple method of rubbing a little soap on the inner edges of the drawers will overcome this difficulty.

Cream Pool Established Recently on the Minidoka Project, Idaho

Operated by the Mini-Cassia Dairyman's Association, this cooperative organization to establish a more direct relationship between producers of cream and consumers of butter gives promise of a successful future

By E B Darlington, Superintendent, Minidoka project

A COOPERATIVE organization whieh promises to have an important influence in the economic life of the community was established recently on the Minidoka projeet, in southern Idaho. The new venture is a cream pool, whieh is being operated by the Mini-Cassia Dairyman's Association, a mutual allianee representing a membership in both Minidoka and Cassia Counties, which lie on opposite sides of Snake River and are in large measure united agrieulturally within the boundaries of the Minidoka Federal irrigation project.

The movement toward eooperation among local dairymen started about four years ago, but it was during the sessions of a dairy school held at the village of Declo last January that it erystallized into activity as a live organization determined to enter the business field. On June 7 a receiving station was opened and a program of eolleeting cream was inaugurated.

The objects of the association are to establish a more direct relationship between the producers of cream and the eonsumers of butter, to reduce overhead charges in manufacture and to obtain for the membership any advantages that the market may afford. It is believed by the members that they will be able, through handling of the eream on their own account and the sale of butter through their marketing organization, to seeure to themselves the profits on butterfat that have been going to outside concerns.

SIX COLLECTION ROUTES

Headquarters of the pool are at Burley. From this central point, trucks are sent out to eollect eream from the farmers and it is all brought into the station for testing, cooling, grading, and preparation for shipment to the ereamery at Jerome, about 50 miles away, where for several years a cooperative establishment has been operated. The cream collected and prepared locally is sent by truck daily to the Jerome creamery, the product of a collecting station at Eden being picked up en route. There are six collection routes out of Burley, with three trucks covering the territory.

The plan adopted by the association is to have the truck drivers call for separated cream on half the patrons each day, so that all members will have an opportunity to forward their produet every other day, including Sundays during hot weather. Payment for the cream is made upon the next visit following the delivery or at the headquarters station, on an advanee price basis determined upon the existing market and the outlook. Adjustments in price are made monthly, according to actual reeeipts for butterfat by the association. A premium of 3 cents per pound of butterfat is paid for sweet cream and the farmers are urged to keep it sweet, for the maintenance of high butter standards. Butter is sold at sour eream priees to the farmers who are shipping, or 3 cents off the sweet eream price.

A contributor to the pool

On June 15 more than 1,600 eows were signed up for the pool, but not all of them were eontributing, on account of delays eneountered in making final arrangements. Hay harvest was on and it has been impossible for all members to establish themselves immediately upon the new basis, requiring additional equipment in the way of separators, containers, ete. However, the average daily shipment to the Jerome ereamery for the first month of operation is estimated to be from 800 to 1,000 pounds and it is believed that by the end of the summer the output of the Burley station will be at least 30,000 pounds of butterfat per month.

The membership in the Mini-Cassia Association now numbers about 260 dairymen. A development in the next few months to about 350 members, with upwards of 2,000 cows eontributing, is expeeted by the officers and directors of the pool.

JEROME CREAMERY HANDLES PRODUCT

The arrangement by whieh the new organization has its product manufactured into butter at the Jerome Cooperative Creamery and marketed from there is considered advantageous from the standpoint of both the dairymen and the creamery administration. The association has taken a single share in the Jerome Cooperative, and is accorded exaetly the same treatment as if each individual member were a shareholder. The creamery pays the cost of collecting, testing, cooling, grading, and hauling the cream, and the salary of the manager of the Burley station, on the theory that the largely increased volume from this locality reduees the unit overhead eost. It is planned to operate the Jerome creamery at night to handle the additional input. The Jerome establishment already produces 175,000 pounds of butter per month and has the second largest volume of any creamery in the State.

The butter from the Jerome ereamery, including that manufactured for the Mini-Cassia Association, is marketed through the Challenge Butter Association, of Los Angeles, whieh is owned by 15 cooperative creamery associations and absorbs practically the entire product of all of them. Beeause of the high standards maintained by this marketing organization and required of its eontributors, it is able to obtain a price for sweet-cream butter several cents in advanee of the general market in southern California.

OVERHEAD COSTS REDUCED

By handling the large volume through the Jerome creamery, partially supplied by Minidoka project dairymen, it will be feasible, aeeording to local offieials, to reduce the proportion of overhead costs so that the cream producers can be paid at least 2 cents per pound more for butterfat than the market price of butter at Los Angeles. This is possible because of the overrun in finished butter weight as eompared with the poundage of butterfat.

A great deal of the milk from projeet dairy herds has been going to the cheese faetories, there being five of these institutions in the community. Four of them are owned by the Laab interests and one is a eooperative plant. The eream pool will probably make inroads upon the business of these establishments and there will doubtless be a strong competitive market for dairy products hereabouts for some time.

Contract Between United States and King Hill Irrigation District

Under the Fact Finders' Act

THE contract referred to above is dated March 2, 1926. After certain explanatory recitals, stating the history of the contract relations between the United States and the district, Articles 5, 6, and 7 obligate the district to make payment of the construction charges on the crop return basis, as permitted by the act of December 5, 1924 (43 Stat. 672), commonly referred to as the fact finders' law. Because of the interest attaching to these three articles, as a concrete application of the fact finders' law to the King Hill project, they are here copied in full, as follows:

REPAYMENT TERMS

"That in lieu of the terms of payment provided for in said original contracts applicable to the construction charges payable by the district to the United States, said construction charges shall hereafter come due in the following installments and upon the following terms and conditions:

"(*a*) On December 1, 1928, and on December 1 of each year thereafter, the district will pay to the United States an annual construction charge which shall be determined by multiplying the average rate per acre (as announced and determined by the Secretary) by the number of irrigable acres of land in the district subject to construction charges as the said number of acres is announced and determined annually by the Secretary.

"(*b*) The average rate per acre to be used in determining the annual construction payment to be made to the United States by the district will be 5 per cent of the average gross acre-income (as determined by the Secretary) of the area of irrigable land in cultivation in the district for the 10 calendar years first preceding the year in which such installment comes due as found by the Secretary annually. The decision of the Secretary as to any such installments shall be conclusive.

"(*c*) For the purpose of determining the annual construction payment to be made by the district to the United States, all the irrigable lands in the district are considered to be in one class, but it is agreed that the district, if it so desires, may classify the lands of the district and upon the approval of such classification by the Secretary may collect annual construction assessments at different rates per irrigable acre from the lands of the various classes, but the annual construction payments to be made by the district to the United States will not be changed by such classification. Should the district decide to make the land classification provided for herein, the district may have the use of the Government records in regard to land classification, and also the Government records in regard to crop returns from the various farm units in determining the proper rate of construction assessment applicable to each class of land.

"(*d*) In determining the number of irrigable acres of land in the district subject to construction charges for use in determining the annual construction payment to be made by the district to the United States, the Secretary may determine the number of irrigable acres in said district, which in his judgment can be properly irrigated with the water supply available for said project, and the number of acres so determined by the Secretary to be the number which can be properly irrigated with the water supply available on said project will be used as the number by which the average rate per acre will be multiplied in determining the annual-construction payment to be made by the district, but such determination as to the number of irrigable acres subject to construction charges may be modified by the Secretary from year to year as he shall find conditions warrant.

"Construction payments on the basis above set out shall continue from the district to the United States until the construction indebtedness of the district to the United States as determined by said original contracts has been fully paid, plus any amounts added to said construction indebtedness (*a*) on account of interest or penalties; (*b*), in analogy to the method fixed in subsection L of section 4 of the said act of December 5, 1924, by which any due and unpaid construction, or operation and maintenance charges and penalties are added to the unaccrued and unpaid construction charge to ascertain the new total construction obligation."

FUNDING INDEBTEDNESS

The contract provides for the keeping of crop records by the district, and for the checking of these records by the United States. The contract, as permitted by the fact finders' law, allows the delinquent charges due from the district to be added to the unaccrued and unpaid construction charges, thus in effect funding the due and unpaid indebtedness of the district to the United States.

The district is to make no substantial change in the project works, which are to to be operated and maintained by the district, unless the Secretary of the Interior consents to such change. The annual construction payments are made semi-annually on December 31 and on July 31, these payments being fixed at such dates as will allow the district to secure the monies when paid by the individual water users in meeting their taxes, and to turn over to the United States the money due the Government.

OPERATION AND MAINTENANCE CHARGES

The board of directors of the district are authorized to determine the amounts of the annual operation and maintenance charges payable by the water users owning land in the district. The district must require payment of the operation and maintenance charges in advance, this being enjoined by subsection N of section 4 of the fact finders' act.

The Secretary of the Interior has the option, under the contract, to retain the operation and maintenance of the headworks of the main canal, in which event the district is to pay the United States the cost incurred by it in connection with the headworks. The United States is to be under no obligation to furnish any water for the lands of the district if the district is delinquent in the payment of any charges due the United States, and in case of breach of the contract by the district the contract may be canceled upon one year's notice to the district.

The Secretary is empowered to make inspections of the transferred works from time to time, and the cost thereof and of any repairs that he may require is to be borne by the district.

A COMMITTEE from the Portland and Oregon State Chamber of Commerce visited the Unatilla project recently with a view to aid in settlement. They were guests of the various commercial clubs and were favorably impressed with the future possibilities for development.

COLLECTIONS during June on the Strawberry Valley project amounted to $8,223.80, of which $2,319.20 were construction charges, $3,306.54 operation and maintenance charges, and $2,598.06 power and miscellaneous collections.

A Utah County Truck Farm

W. H. Olin, Supervisor of Agriculture, Denver & Rio Grande Western R. R. Co.

On the Mapleton Bench, Strawberry Valley project, Utah

PERHAPS the best truck farm in all Utah County lies under the Strawberry Valley reclamation project. It is just a few miles out from Payson, Utah, in the south end of Utah County. As one approaches this farm he reads a farm sign by the roadside:

UITHNAGE TRUCK FARM
DRIVE IN AND LOOK AROUND
FRANCOM'S FAMOUS WATERMELONS

The writer was told that the farm is named after the place in South Africa where the owner—John H. Francom—was born.

The total area of this farm is 60 acres. Approximately 40 per cent of it is in alfalfa. The truck crops are in small areas but farmed most intensively. We question whether in all Utah there is to be found a more careful farmer who keeps up the quality of every truck crop as Mr. Francom does. Perhaps he is best known for his watermelons. He usually has 5 to 10 acres given to this crop. This year he has 7 acres. For a number of years it has been his custom to select carefully and mark by stake the most symmetrical melons, growing on thriftysturdy vines, for his seed for the succeeding year. He will not sell these melons at any price, but will let the visitor or guest at his farm eat the melon provided he places the seed of that particular melon in a receptacle provided for the purpose. In this manner he has worked up a melon noted for its symmetry, choice flavor, and size. Although he could send carloads of these choice melons to market, he ships only a small portion of his crop. Why? Because his melon patch is so well known within its district that, from the near-by towns and mining camps people come by the hundreds on week ends, during melon time and buy his surplus to take home in their autos. His major market, therefore, is right at home on the farm.

FAMOUS FARM PRODUCTS

His strawberries and raspberries are no less famous and find a ready market at Payson, Spanish Fork, Tintic, Springville, Provo, and Salt Lake City. This farm this season has 17 acres in berries.

Here also one finds the very choicest of Spanish sweet onions grown. This season Mr. Francom has 5 acres planted to this crop.

Utah's earliest table potatoes come from this truck farm. The writer saw 10 acres growing here with an almost perfect stand. Mr. Francom grows his own onion seed, so he insures getting the quality of table onions the market pays the best money to obtain. He sells some onion seed, but this is not a commercial crop with him. Like all crop farmers in this district, Mr. Francom has a field of sugar beets. This year he has only 4 acres planted, but he will get a tonnage from this field to obtain which the average sugar-beet farmer has to have double that acreage.

(Continued on page 139)

Part of the large crop of sugar beets grown on the Strawberry Valley project, Utah

Notes From Our Projects 10 Years Ago

From the Reclamation Record of August, 1916

THE Community Club of Mitchell, Nebr., entertained as guests at lunch June 7, Dr. Elwood Mead, chairman of the general board of review of the Reclamation Service, and Mr. Carl Slatt, of the Nebraska Farmers' Union. Both gave interesting addresses, Doctor Mead speaking particularly of the work that is being done by European countries in the way of rural credits, especially as it gives aid to the renter in helping him to become a landowner. He called attention to the fact that America has a larger percentage of tenant farmers than any other country in the world and that our own rural credit law does not extend help to this class, but is confined exclusively to the man who owns his land. One of the objects of Doctor Mead's visit was to get an intimate knowledge of the needs of the project in the line of rural credits.

The "sticking point" with many a farmer is his failure to get on with his neighbors; this has been true for centuries. One progressive county in this country has adopted the slogan "Get acquainted with your neighbor; you might like him." In the writings of the ancient Romans we find this advice about neighbors:

"Be a good neighbor. Do not roughly give offense to your own people. If the neighborhood regards you kindly you will find a readier market for what you have to sell; you will more easily get your work done either on the place or by contract. If you build, your neighbors will aid you with their services, their cattle, and their materials. If any misfortune should overtake you (which God forbid) they will protect you with kindly interest."

The method of applying irrigation water to the soil is of prime importance to every irrigation farmer. Different soils require different treatment, and the selection of a right or a wrong method of applying the water may mean the success or failure of the farmer. A proper appreciation of the general principles of applying water will enable the water user to avoid many expensive mistakes and from the first secure all the advantages of irrigation farming.

As a general rule the method selected depends on a variety of conditions, such as topography or slope of the land, nature of the soil and subsoil, texture of the soil, value of the land, climatic conditions, and the nature and value of the water right.

A number of improvements on the Minidoka project were put under way. A new railroad freight depot was built at Rupert and new tracks were laid. Contracts were let for the new courthouse at Rupert. It is reported that the Salt Lake & Idaho Railroad, now constructed from Burley to Marshfield, will be extended at once into the Raft River country.

The entire canal system of the Okanogan project was operated throughout the month, the project lands having been quite generally irrigated during the fore part of the month and throughout the hot spell, but the demand gradually decreased after the rains began and, at the close of the month, the canals were carrying only about one-half their capacity. The flood run-off of Salmon Creek reached the highest stage in the history of the project toward the close of the month and, the reservoir being flooded, it was necessary to run the entire flow down Salmon Creek and waste such portion of it as was not diverted by the canals of the project and other irrigation ditches, Some damage was done to roads and bridges.

Utah County Truck Farm

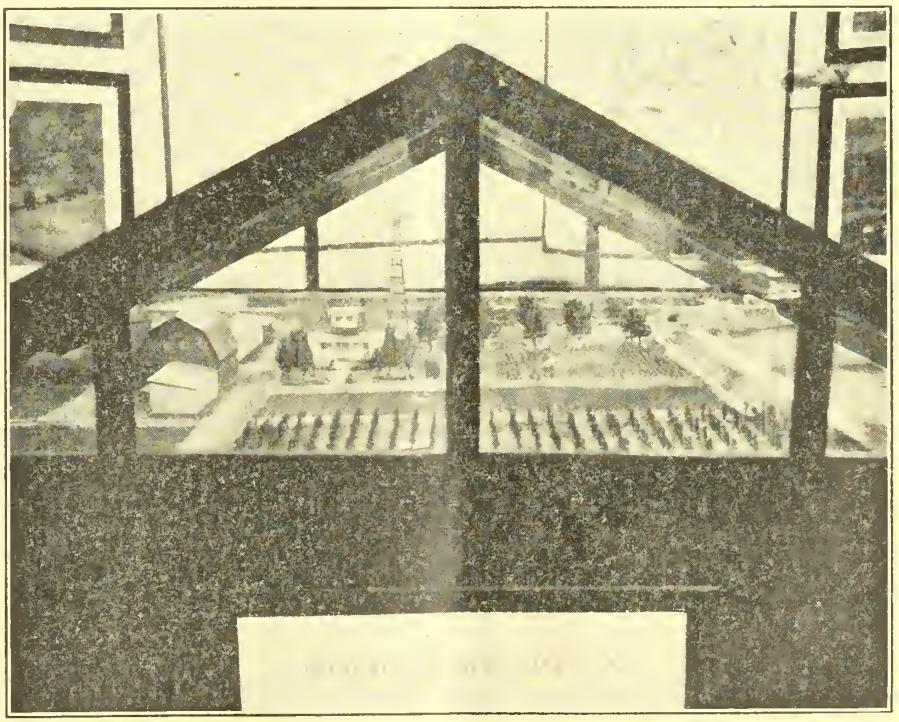
(Continued from page 138)

In smaller acreage one sees commercial crops of asparagus, rhubarb, horse-radish, bulbs, and miscellaneous garden and flower seeds being grown, along with choice and rare flowers for this farmer's own satisfaction and for the market.

Here is a Utah farm most carefully cultivated. It shows what fertility these Utah Valley soils possess, in one of the most delightful mountain environments one can desire.

Close to this farm live Mr. and Mrs. H. W. Gore. Mrs. Gore is chairman of the community life committee of the American Farm Bureau Federation, which has its headquarters office in Chicago. Mrs. Gore is recognized as one of the most valued farm workers on community farm life problems in this whole Nation. Her influence is felt and appreciated in this beautiful Utah valley.

The home seeker will do well to visit this district, where 40 acres make a good sized farm and 80 acres a big farm. Mr. Francom has set the pace, and this one valley can find place for at least 100 more with his energy, patience, and resourcefulness.



Model of irrigated farm. Part of the exhibit of the Bureau of Reclamation at the Sesquicentennial International Exposition, Philadelphia, Pa.

Recent Federal Irrigation Legislation

Passed by the 69th Congress

Rights of Way

BE it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 18 of what is generally known as the Irrigation Act of March 3, 1891, as amended by act of March 4, 1917, be, and is hereby, amended so as to read as follows:

"SEC. 18. That the right of way through the public lands and reservations of the United States is hereby granted to any canal ditch company, irrigation or drainage district formed for the purpose of irrigation or drainage, and duly organized under the laws of any State or Territory, and which shall have filed, or may hereafter file, with the Secretary of the Interior a copy of its articles of incorporation or, if not a private corporation, a copy of the law under which the same is formed and due proof of its organization under the same, to the extent of the ground occupied by the water of any reservoir and of any canals and laterals and fifty feet on each side of the marginal limits thereof, and, upon presentation of satisfactory showing by the applicant, such additional right of way as the Secretary of the Interior may deem necessary for the proper operation and maintenance of said reservoirs, canals, and laterals; also the right to take from the public lands adjacent to the line of the canal or ditch, material, earth, and stone necessary for the construction of such canal or ditch: *Provided,* That no such right of way shall be so located as to interfere with the proper occupation by the Government of any such reservation, and all maps of location shall be subject to the approval of the department of the Government having jurisdiction of such reservation; and the privilege herein granted shall not be construed to interfere with the control of water for irrigation and other purposes under authority of the respective States or Territories."

Approved, May 28, 1926. Public No. 302.

Storage of Waters of the Pecos River

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in accordance with the provisions of the act of June 17, 1902 (Thirty-second Statutes at Large, page 388), and acts amendatory thereof or supplementary thereto, except as the same are modified herein, the Secretary of the Interior is hereby authorized and empowered to construct the Red Bluff Federal Irrigation Project, consisting of a reservoir upon the Pecos River, sufficient in size for the irrigation of not exceeding forty thousand acres of land in the State of Texas, which reservoir shall be located at a point where it will impound the flood waters of Delaware Creek and Black River, and shall be provided with all necessary incidental works for the operation of the same.

SEC. 2. That no expenditure for construction shall be made under this act until an appropriate contract or contracts in form approved by the Secretary of the Interior, providing for the payment to the United States as provided herein of the costs incurred on account of said project, shall have been properly executed by a district or districts organized under State law and embracing property to be benefited by said project, and such execution shall have been confirmed by a court of competent jurisdiction: *Provided,* That expenditures may be made hereunder at any time to cover necessary expenses incurred by the United States on account of preliminary investigations and negotiations in connection with the execution of the contract or contracts provided for by this section.

SEC. 3. That the total cost to the United States of the construction of said project shall be repaid to the United States in twenty annual installments, without interest, as follows: Five per centum thereof on March 1st of the second year following the year in which water becomes first available from said reservoir for irrigation, and 5 per centum thereof annually thereafter until the whole amount is paid: *Provided,* That if any installment shall not be paid when due there shall be added at once to such installment a penalty of 1 per centum thereof and thereafter on the first day of each month a like penalty so long as the default continues.

SEC. 4. That the cost to the United States of operating and maintaining said project shall be paid to the United States in advance upon annual estimates made by the Secretary of the Interior, and upon a day to be fixed by him: *Provided,* That the cost of operating and maintaining the project the year water is first available therefrom for irrigation, shall be merged with and made a part of the construction cost. If the estimate for any one year shall be either more or less than the actual cost, an appropriate adjustment shall be made in the estimate for the next succeeding year.

SEC. 5. That no classification by the Secretary of the Interior of the irrigable lands of said project shall be required, nor shall he issue any public notice relating to construction charges against said lands: *Provided,* That the Secretary of the Interior shall determine the cost of said project, including the cost of operating and maintaining it the first season water is available therefrom for irrigation, and shall furnish a statement of such cost to the contracting district or districts.

SEC 6. That there is hereby authorized to be appropriated from any moneys not otherwise appropriated, in the reclamation fund such an aggregate amount as may be necessary to carry out the purposes of this act, not exceeding the sum of $2,000,000.

SEC. 7. In the event that any irrigation works are constructed under the authorization contained in this act, neither the United States, the State of Texas, nor any of the parties for whose benefit said works are to be constructed shall at any time hereafter have or claim, or attempt in any manner to acquire, any right to the use in the State of Texas of any water which shall flow in the Pecos River, or any of its tributaries, in New Mexico at or above the Avalon Dam, except such of said water as may not at any time be used or diverted from or above said dam: *Provided,* That nothing in this section shall be construed to curtail the quantity of water to which present users in Texas may now be lawfully entitled: *And provided further,* That no construction under this act shall begin until the State of Texas, through legislative act, signed and approved by the governor of said State, shall have agreed to the provisions of this section.

Approved, June 18, 1926. Public, No. 404.

Yuma Water Users Get Credit for Payments

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 be, and he is hereby is, authorized and directed to credit the individual water-right applicants in the Yuma reclamation project and the purchasers of water rights in the Yuma Mesa auxiliary reclamation project, on the construction charges due under their contracts with the United States under the reclamation act and acts amendatory thereof and supplementary thereto, with their proportionate part of all payments heretofore made or hereafter to be made by the Imperial irrigation district, of California, under contract entered into under date of October 23, 1918, between the said district and the Secretary of the Interior: *Provided,* That lands in the Yuma Indian Reservation for which water rights have been purchased shall share pro rata in the credits so to be applied.

Approved, June 28, 1926. Public, No. 438.

May Employ Engineers for Dam Consultation

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is authorized, in his judgment and discretion, to employ for consultation on the plans and specifications for any dam proposed to be constructed by the Department of the Interior, the services of not more than three experienced engineers, determined by him to have the necessary qualifications, without regard to civil-service requirements and at rates of compensation to be fixed by him for each, respectively, but not to exceed $50 per day

(Continued on page 141)

Benefits of the Warehouse Act To Project Water Users

THE United States warehouse act is a law passed by Congress in August, 1916. It is applicable only to public warehousemen storing agricultural products. At this time the following products are storable under the law: Cotton, grain, wool, tobacco, farmers' stock or peanuts, late crop of potatoes, broomcorn, dry edible beans, dried fruit, and sirup (including cane and maple.)

BENEFITS FROM STORING IN FEDERALLY LICENSED WAREHOUSES

The principal benefits which the farmer may expect to receive from storing his products in warehouses licensed under the United States warehouse act are:

1. A safe place for storage.

2. Weights and grades of his products determined by disinterested and competent persons.

3. As security for loans, the Federal warehouse receipts will make it possible for him to borrow on the loan value of his product rather than on his personal responsibility.

4. A larger amount of credit may usually be secured with a Federal warehouse receipt as security for the loan.

5. A larger field of credit upon which to draw is opened to the farmer by the use of Federal warehouse receipts.

6. If the farmer handles his credit problems properly, he ought to be able to obtain a lower interest rate than by the use of the ordinary warehouse receipt.

7. By storing products with federally licensed warehousemen, the farmer can feel assured that his products are in the hands of persons who know how to care for them and to prevent them from deteriorating.

8. Frequently the farmer can obtain a lower insurance rate on his products when stored in federally licensed warehouses.

9. If his farm is located at some distance from the shipping point and the roads between the farm and the shipping point are not improved, placing the products in federally licensed warehouses generally means having them at a point from which they can be shipped at any time of the year regardless of weather conditions, thus making it possible to take advantage of desirable opportunities to sell.

10. By storing in licensed warehouses, large quantities of products are accumulated at one point. This concentration of products creates a market point and attracts more buyers than usually operate where small quantities of products can be bought. The more buyers there are in a market the keener is the competition, with the result that usually better prices are paid.

11. By insisting on having the grade, condition, and weight of the stored products stated on the warehouse receipt, the farmer gets a fair idea of the value of his product. By consulting daily market quotations, he can then determine just what price is a fair selling price for his products.

UP TO THE FARMERS

If the warehouseman in the community where the farmer takes his products for storage is not operating under the Federal law, and the farmer desires the benefit of this law, he should let the warehouseman know that if he wants his business the warehouse must be operated under the law. It rests with the farmer to say whether he shall have a warehouse receipt issued under the Federal warehouse act. *From Misc. Circ. No. 51, U. S. Dep't. of Agri.*

AN acre of cherries near Sunnyside, Yakima project, is reported to have yielded 10.5 tons of Bing cherries, 329 pounds of Lamberts, and 1,215 pounds of Black Republicans, the returns totaling $2,424.58.

Recent Legislation

(Continued from page 140)

and necessary traveling expenses, including a per diem of not to exceed $6 in lieu of subsistence for each engineer respectively, not exceeding in the aggregate more than $3,500 for any engineer so employed for the time employed and actually engaged upon such work: *Provided*, That retired officers of the Army may be employed by the Secretary of the Interior as consulting engineers in accordance with the provisions of this act.

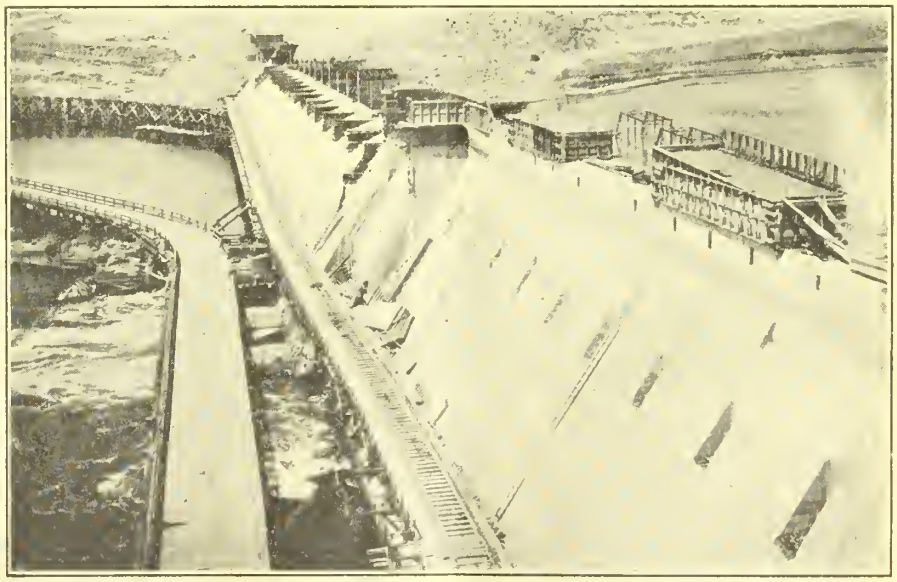
Approved, June 28, 1926. Public Res., No. 40.

Water-Right Charges and Liens Canceled

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 be, and he hereby is, authorized to cancel water-right charges of any and every kind in connection with the Buford-Trenton and Williston irrigation projects in North Dakota constructed under the act of Congress approved June 17, 1902 (Thirty-second Statutes at Large, page 388), and acts amendatory thereof or supplementary thereto, and to release or consent to the release of any and all liens however created and now existing against lands of said projects on account of said water-right charges.

SEC. 2. The Secretary of the Interior is authorized to do any and all things necessary to give full effect to the provisions of this act.

Approved, May 26, 1926. Public, No. 291.



Construction progress at American Falls Dam, Idaho

Organization Activities and Project Visitors

COMMISSIONER MEAD returned to the Washington office on July 21 after making a first-hand inspection of economic conditions on a number of the projects. He leaves for Haiti on August 10 to make an inspection of a proposed irrigation development.

H. J. Gault, formerly employed by the bureau, who for the past six months has been engaged on irrigation investigations in Mexico with a private concern, was reinstated in the Denver office effective June 30.

C. C. Elder, assistant engineer, who has been at Kilgore, Idaho, in charge of the Dubois secondary investigations, has returned to the Denver office.

C. H. Howell, engineer in the Denver office, has resigned to accept a position with the middle Rio Grande conservancy district.

S. B. Shannon and N. Shand, engineers from the irrigation department of the South African Government, who are visiting this country for about a year, and who wish to get a working familiarity with the way our irrigation projects are run and the manner in which farms are cultivated, were visitors at the Denver office recently.

Miss Avola Hendrix, underclerk on the Yuma project, resigned recently.

Elie Aghion, of Alexandria, Egypt, who is interested in irrigation agriculture, was a recent visitor on the Yuma and Rio Grande projects.

A. C. Cooley, director of farm demonstrations on reclamation projects, inspected the gravity division of the Grand Valley project on June 30. Mr. Cooley had attended the divisional conference of extension agents at Delta, Colo., and visited the project en route to his headquarters in Salt Lake City.

The American Falls Dam was visited recently by Carl Gray, president, and other officials of the Union Pacific Railroad, and by Barry Dibble, former superintendent of the Minidoka project.

Miss M. E. Scully, clerk at American Falls, has been transferred to the office of the district counsel at Boise.

Among the recent visitors to the Milk River project was L. C. Gilman, vice president of the Great Northern Railway.

Messrs. Baughman, of the Federal land bank at Wichita, Kans., and of the Drover Stock Bank at Denver, visited the Uncompahgre project recently to look over the project lands relative to the adoption of a policy of making farm loans thereon.

J. G. Marr and A. T. Mitchelson, irrigation engineers of the Bureau of Roads Department of Agriculture, visited the Minidoka project during June to study moss-removal operations.

State Engineer George M. Neel was on the Carlsbad project the latter part of June in connection with matters pertaining to Black River.

Visitors to McKay Dam during the month included a delegation from the Portland Chamber of Commerce, who were interested particularly in obtaining settlers for that part of the State.

Fiscal Inspector C. A. Lyman is in the Washington office in connection with fiscal adjustments on the projects.

R. J. Coffey, district counsel, spent several days on the Klamath project

Preparing land for crops on the Belle Fourche project, S. Dak.

in connection with project matters and holding a hearing to obtain evidence for the Government in regard to the exclusion of the Enterprise Land & Investment Co. lands from the Klamath irrigation district. B. E. Hayden, industrial agent, and I. S. Vorhees, of the California State Highway Department and formerly with the bureau, were called as witnesses.

Miss Margaret Regan, junior clerk, Sun River project, resigned at the close of business June 10. Maryden Dahlstrom, junior clerk, reported June 21.

Superintendent D. S. Stuver, Newlands project, visited Reno recently to confer with Harry C. Dukes, Truckee River water master, in regard to the administration of the tentative decree in relation to the project water supply.

Recent visitors on the Klamath project were C. H. Pease, editor of the Delta Irrigation News, McAllen, Tex., and Mr. Rohrer, county road supervisor of Siskiyou County, Calif.

Hon. Desire Pasquet, of Paris, France, spent several days on the Yakima project during the latter part of June.

Unused Land to Be Investigated

Investigation into the development of arid, semiarid, swamp, and cut-over lands, under an appropriation of $15,000 made available on July 1, 1926, in the 1927 Interior Department appropriation act, will be conducted on a cooperative basis with the States.

Commissioner Mead states that four States—North and South Carolina, Georgia, and Mississippi—have already indicated a desire to enter this cooperatwe arrangement. Other States are requested also to cooperate in the investigations. The first step, as proposed by the Reclamation Bureau, is to determine where tracts of land can be found which are suitable for reclamation and settlement. Colonies for farmers can then be established upon them under a definite agricultural program. These tracts should be large enough to permit the settlement of 100 to 200 families and should comprise 10,000 to 30,000 acres.

Information regarding the location of available areas, possible prices for land, and suitability for such development are solicited by the Bureau of Reclamation.

R. K. Cunningham, chief clerk, and P. M. Wheeler, bookkeeper, of the Yakima project, visited the Ellensburg office, Kittitas division, to assist on accounting procedure, following the previous transfer of the Kittitas accounts from the Yakima to the Ellensburg office.

H. A. Glen, district freight agent of the Northern Pacific Railroad, called at the Ellensburg office, Kittitas division, to discuss freight rates on construction materials.

Karl F. Keeler, former engineer of the Strawberry Valley Water Users' Association, has been appointed in the Bureau of Reclamation and assigned to the engineering division of the Washington office.

Oscar P. and Mary E. Y. Thornton, of Somerton, Ariz., water users on the Yuma project, called at the Washington office on July 21. Somewhat appropriately and with a desire to please our visitors in every way, this was the hottest day so far recorded this year in Washington, the temperature rising to 104° F. and equaling that of Yuma itself on the same day. Mr. and Mrs. Thornton were traveling by auto and were planning to visit the Sesquicentennial Exposition in Philadelphia.

Cutting a heavy growth of alfalfa on the Carlsbad project, N. Mex.

Delinquent Water User not Entitled to Service

Russell Holmes and his wife filed suit in the Superior Court for Okanogan County, Wash., against the Whitestone Irrigation & Power Co. for damages alleged to have been sustained as the result of failure of the company to furnish water for the irrigation of their lands. From a judgment for the defendant, plaintiffs appealed. In an opinion filed March 29, 1926, affirming the judgment of the lower court, the Supreme Court of Washington, said (244 Pac., 579)—

"The court having found that appellants were delinquent in the matter of the payment of their bills for water theretofore used, we think the right to refuse to supply further water was one that can properly be exercised as it was in this case, no matter what rights the public generally may have to require such service. No user of water can refuse to pay his delinquent bills and still demand service."—*R. J. C.*

DURING the month an additional application was received for a farm on the Riverton project. Three applicants appeared before the examining board, but action on their applications was suspended temporarily, and no additional farms were assigned.

The Newlands Project In the Dairy Field

At a recent dairy field day held in Washoe County, near Reno, Nev., it was brought out forcibly that the Newlands project has a remarkable opportunity in dairying on account of its strategic location in relation to the strongest dairy product market in the world. The project can grow at low cost abundant crops of alfalfa, the most important dairy ration, and market the products at San Francisco, the highest market for butterfat in the world. San Francisco occupies this unique position because the population of the Pacific coast is growing at such an accelerated rate that dairy production can not keep pace, and because the per capita consumption of dairy products is ever increasing, owing to the activities of the various organized agencies working for the promotion of the dairy industry. California's butter consumption in 1925 was 94,492,798 pounds, of which only 73,599,667 pounds were produced within the State. Logically, Nevada and the Newlands project are in a better position, by virtue of contiguous location, than any of the competitor States to supply the California deficiency.—*D. S. Stuver, superintendent, Newlands project.*

Nevada Supreme Court Finds Contract Valid

The Truckee-Carson Irrigation district under date of January 22, 1921, entered into a contract with the United States by which the United States agreed to expend a maximum of $700,000 toward the drainage of the district lands, which comprise a portion of the Newlands Federal reclamation project.

Statutory proceedings to confirm the contract were brought and upon appeal to the supreme court of the State the court (April 5, 1926, 245 Pac. 285) upheld the constitutionality of the Nevada irrigation district law and confirmed the proceedings, finding the irrigation district to have been duly organized and the contract to be valid. The court also upheld the power given to the district by a State statute to assess high lands for drainage charges when such high lands contributed to the seeped condition of the lower lands of the district. It was also held that drainage assessments might be levied at a flat rate, if the district board found as a fact that the benefits to the land in the district were equal.

A better class of farm laborers could be attracted by offering steadier employment.

COMPARATIVE COLLECTIONS ON THE RECLAMATION PROJECTS

State	Project	Construction				Operation and maintenance			
		May, 1925	May, 1926	Fiscal year 1925 to May 31, 1925	Fiscal year 1926 to May 31, 1926	May, 1925	May, 1926	Fiscal year 1925 to May 31, 1925	Fiscal year 1926 to May 31, 1926
Arizona	Salt River			$599,326	$643 862				
Arizona-California	Yuma	$2,296	$1,716	351, 672	341, 928	$5,810	$2,368	$303, 647	$224, 724
California	Orland	1,880	2, 155	35, 222	81, 654	634	976	26, 361	35, 133
Colorado	Grand Valley	(1)	(1)	(1)	(1)	4, 079	2, 059	46, 740	54, 359
	Uncompahgre	181	6, 586	25, 122	120, 127	778	6, 671	75, 527	136, 525
Idaho	King Hill							71	161
	Minidoka:								
	Gravity	1, 275	16, 807	61, 586	150, 037			12, 639	31, 407
	Southside pumping	148	314	30, 507	71, 068	240	6, 215	36, 426	53, 885
	Jackson Lake		80	31, 970	40, 062	2, 803	10, 208	14, 859	15, 956
Idaho-Oregon	Boise	27, 751	9	224, 750	118, 601	13, 044	750	103, 982	133, 489
Montana	Huntley	1, 839	4, 643	18, 964	27, 789	4, 553	3, 938	31, 465	34, 804
	Milk River	(1)	(1)	(1)	(1)	1, 526	1, 856	15, 274	17, 875
	Sun River:								
	Fort Shaw	467	898	7, 553	7, 564	426	518	7, 351	7, 489
	Greenfields	(1)	(1)	(1)	(1)	3, 008	2. 116	13, 824	15, 656
Montana-North Dakota	Lower Yellowstone		1, 121	3, 350	13, 968		2 448	5, 221	20, 051
Nebraska-Wyoming	North Platte:								
	Interstate	316	7, 234	25, 149	31, 877	2, 718	1, 035	44, 335	46, 504
	Fort Laramie	(1)	(1)	(1)	(1)	22, 939	2, 987	57, 692	36, 153
	Storage		500	31, 989	20, 790			12, 633	4, 558
	Northport							22, 748	23, 381
Nevada	Newlands	1, 038	711	39, 879	54, 272	6, 103	1, 967	99, 693	120, 398
New Mexico	Carlsbad	577	686	67, 097	47, 322	638	594	64, 476	37, 066
New Mexico-Texas	Rio Grande	8, 365	2, 967	199, 601	219, 644	9, 328	49, 018	211, 091	146, 701
North Dakota	Williston					1, 746		5, 706	
Oregon	Umatilla			5, 730	417		57	17, 579	8, 002
Oregon-California	Klamath	1, 313	1, 482	61, 320	35, 771	8, 661	617	58, 428	40, 215
South Dakota	Belle Fourche						39, 694		39, 694
Utah	Strawberry Valley	2, 302	2, 244	70, 393	103, 532	604	551	25, 074	31, 496
Washington	Okanogan			1, 068	5, 234			3, 998	31, 956
	Yakima:								
	Sunnyside	1, 455	1, 103	57, 319	161, 924	14, 860	10, 152	85, 375	159, 645
	Tieton	14, 780	4, 163	144, 041	173, 998	8, 193	1, 223	88, 229	83, 170
	Storage	32, 500	5, 330	57, 935	88, 305			20, 577	17, 886
Wyoming	Shoshone:								
	Garland	182	4, 463	9, 870	29, 902	2, 320	2, 107	16, 437	36, 800
	Frannie	(1)	(1)	(1)	(1)	1, 621	2, 001	7, 494	6, 981
Total		98, 665	65, 212	2, 161, 413	2, 589. 648	116, 632	152, 126	1, 534, 952	1, 652, 093

[1] Projects on water-rental basis.

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 — P. W Dent, Assistant to the Commissioner — C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. N. McCulloch, Chief Clerk

George C. Kreutzer, Director of Reclamation Economics

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	J. B. Bond				
Carlsbad	Carlshad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	Ottamar Hamele	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	A. R. McGinness	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.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	El Paso, Tex.
Riverton	Riverton, Wyo	H. D. Comstock	R. B. Smith	V. E Hubbell	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	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg	H. M. Schilling	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.
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

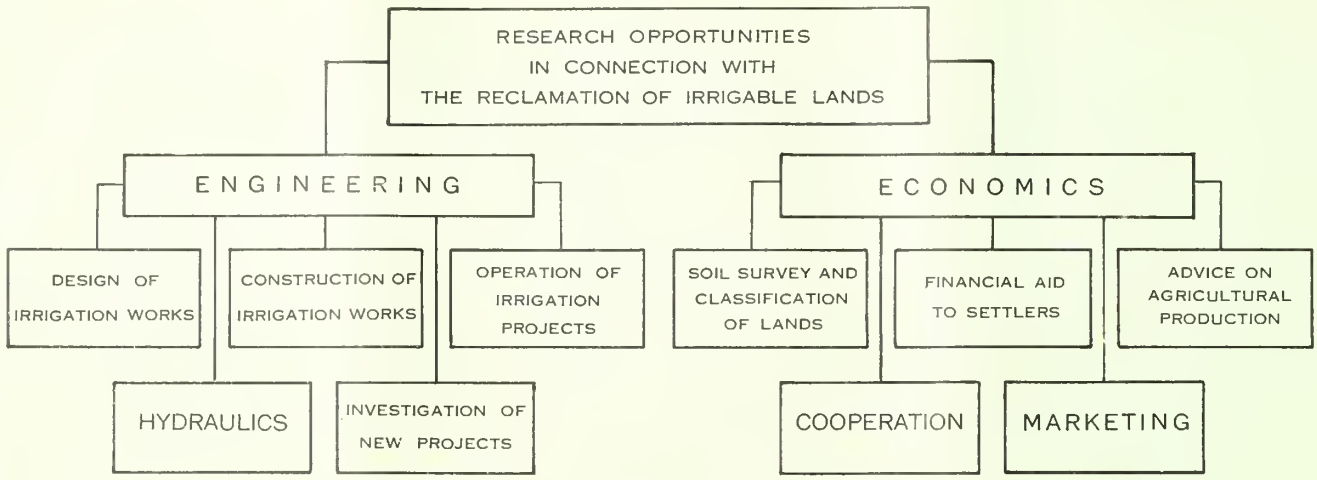
Minidoka, American Falls Dam.	American Falls, Idaho.	F. A. Banks [5]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [5]	Chas. Klingman	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Umatilla, McKay Dam.	McKay Dam, Oreg	R. M. Conner [6]	C. B. Funk	W. S. Gillogly	B. E. Stoutemyer	Portland, Oreg.
Kittitas	Ellensburg, Wash	Walker R. Young [6]	E. R. Mills		do	Do.

[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
Sacramento Valley	Ellenshurg, Wash	Walker R. Young	Sacramento Valley Development Association and State of California.
Spanish Springs storage	Fernley, Nev	A. W. Walker	
Owyhee	do	R. J. Newell	
Vale	do	do	
Middle Rio Grande	Denver, Colo	I. E. Houk	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	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	Washington, D. C	Geo. C. Kreutzer	

The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine To others 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.



TYPICAL EXAMPLES OF RESEARCH PROBLEMS

ENGINEERING:—

Design of Irrigation Works:
- Distribution and amount of Stresses in Concrete Arch Dam
- Coefficients of Friction in Sliding Surfaces of Gates

Construction of Irrigation Works:
- Losses and recoveries of Head in Flumes and Siphons
- Percolation Factors and uplift in Dams and Canal Structures

Operation of Irrigation Projects:
- Determination and Duty of Water; i.e., amount needed for various crops
- Coefficients for flow of Water through Headgate

Hydraulics:
- Curve Losses in Wood, Concrete and Steel Pipes
- Flow of Water over Dams and in Spillway Channels

Investigations of New Projects:
- Drilling of Dam Sites to Determine Location and Character of Bed Rock
- Determination of Available Water Supply

ECONOMICS:—

Soil Survey and Classification of Lands:
- Lack of Fertility in the Soil
- Forest Covering, Uneven Land, Rocky Land, Blowing of Soils, Hardpan
- Grouping of Lands into Productive Classes Ranging from Class 1 to Class 4, and into Temporarily Unproductive Class 5, and permanently Unproductive Class 6

Financial Aid to Settlers:
- Long-Time Loans for Permanent Improvements
- Short-Time Loans for purchase of Livestock

Special Advice on Agricultural Production:
- Relation of Varieties and Acreage of Crops to Economic Agriculture in Specified Localities
- Rotation of Crops and Diversified Farming
- Kinds and Number of Livestock Best Suited to Specified Localities
- Duty of Water and Irrigation Practice

Cooperation:
- Home Building, Preparation of Land and Harvesting Crops
- Social Activities
- Organizations for Buying and Selling

Marketing:
- Relation of Marketing Centers to Project Production
- Special Aids to Marketing: Sorting, Grading, and Packing
- Relation of Good Roads to Marketing Problem

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NEW RECLAMATION ERA

VOL. 17 SEPTEMBER, 1926 NO. 9

HIGH LINE CANAL AND SPANISH PEAKS, STRAWBERRY VALLEY PROJECT, UTAH

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Land Utilization

IN 150 YEARS this country has grown from a population of 3,000,000 to 116,000,000, has occupied about all the land that is attractive for rainfall farming, and has accumulated a wealth estimated at one hundred billion dollars, largely originating from the soil.

It is estimated by the National Bureau of Economic Research that our population gained 1,629,000 during the past year; the natural increase is about 1,500,000 native population, and the immigration laws permit the entrance of about 500,000 more. On this basis it has been estimated that there will be a population of 150,000,000 people in the United States by 1940. On the other hand, the total land area is fixed and is slightly less than two billion acres. Of our total land area, statistics show 50.2 per cent in farms. 26.4 per cent is classed as improved farm land, and 20 per cent is in crops. It is estimated that the potential use will ultimately increase the tilled area by irrigation 1.6 per cent. Ex-Governor Campbell, of Arizona, has recently estimated that less than 1 per cent of the present agricultural production of the country is from irrigated areas under the Federal Government. The total ultimate increase in the productive area is estimated at 8.8 per cent, so that within the next decade or two we are going to need all our good land, and we will need to proceed with an orderly program of national reclamation if this is to come about and if we are to remain a self-supporting nation.

—From the Quarterly News Letter of the Oregon Reclamation Congress.

NEW RECLAMATION ERA

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HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 17 SEPTEMBER, 1926 No. 9

Interesting Highlights on the Reclamation Projects

THE Yuma project reports that the highest yield this year of alfalfa seed is 345 pounds an acre, which at 14 cents a pound would give a return of $48.30. In addition, the acre yielded 1 ton of straw at $4 and three cuttings of hay amounting to $27, giving a grand total of $79.30 an acre, which is about equal to the returns from an acre of cotton.

AS an experiment and as a possible source of additional revenue, approximately 150 acres of head lettuce have been planted on Grand Valley project land from which potatoes have been harvested. It is believed that shipments can be made at a satisfactory price during October and November.

SHIPMENTS of agricultural products from the Yuma project during July amounted to 101 cars, valued at $51,800. Since the first of the year 1,898 carloads of such products have been shipped, valued at $1,544,850.

ARROWROCK Reservoir on the Boise project contained 68,320 acre-feet of water at the end of July. The flow of the Boise River reached the low stage of 1924, but showed an improvement at the end of the month.

CONSTRUCTION work on the tie line from the Lahontan power plant, Newlands project, to Virginia City, Nev., is being pushed actively by the Nevada Valleys Power Co. It is expected that this tie line will be completed early in September.

AT McKay Dam, Umatilla project, all concrete in the parapet wall was poured during the month, and work was in progress on the installation of the spillway gates and lifting devices.

THERE was a heavy draft upon Jackson Lake, Minidoka project, during July, the storage supply at the reservoir diminishing from 488,550 acre-feet on the 1st of the month to 145,010 acre-feet on the 31st. Practically all the remaining storage belonged to canals in the upper valley. American Falls Reservoir was of valuable service in regulating the river flow.

THE total bank deposits in the five banks on the Minidoka project at the end of June amounted to $2,005,600. The Burley banks showed an increase of practically 50 per cent over the record of a year ago. Tax collections in both Cassia and Minidoka Counties show marked improvement over those of last year. There has also been a pronounced reduction in delinquencies in both counties.

FROM 4 acres of 3-year-old Thompson Seedless grapes grown on the Yuma Mesa, the returns from 4,600 pounds were $103 an acre f. o. b. car at Yuma.

AT American Falls Dam, Minidoka project, 23,330 cubic yards of concrete were poured during July. About 13,400 cubic yards of earth were placed in the right embankment and sprinkled and rolled.

FRANK McCULLOCH, of Fernley, Newlands project, has the largest single field of cantaloupes ever planted in Nevada, the field containing approximately 120 acres in a solid stand of Hearts of Gold cantaloupes.

THE Squire-Dingee Pickle Co., Belle Fourche project, has increased the number of vats until the Nisland station is now the largest pickle-salting center in the world, with a capacity of 50,000 bushels.

AT Guernsey Dam, North Platte project, 7,525 cubic yards of rock from the north spillway were placed in the downstream slope and 1,589 in the upstream slope. Work on the dam fill progressed steadily, 60,258 cubic yards of sluiced gravel and 8,570 cubic yards of selected material being placed. Based on gross contract earnings, the dam was 70 per cent completed at the end of July.

THE Fallon sugar factory, Newlands project, has been purchased by local capital with the expectation of operating in 1927. The enterprise is reported to be amply financed, and the fact that some of the largest local landowners on the project are financially interested in the enterprise gives rise to the belief that the prospect for reestablishing the sugar industry on the project on a permanent basis is encouraging.

THE season on the Yakima project has been unusually well advanced, and shipments for July were almost double those for the same month last year. This is particularly encouraging in view of the anticipated shortage of water later in the season.

THE Powell Creamery, Shoshone project, purchased 16,500 pounds of butterfat during July and manufactured 19,100 pounds of butter and 1,300 gallons of ice cream. Other agencies purchased 3,800 pounds of butterfat. The price per pound for butterfat was 32 cents in sour cream and 50 cents in sweet cream.

A HEAVY rainfall at Yuma and vicinity on August 2, amounting to 2.12 inches in an hour and five minutes, did considerable damage to project works and to some farms. Picacho and Unnamed Washes demonstrated their usefulness in reducing the amount of damages and the amount of time in getting water back into the canal to serve crops below.

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Confidence and Optimism Replace Discouragement and Low Morale

Commissioner Mead files comprehensive report with Secretary of the Interior, presenting first-hand views on economic conditions on the projects visited by him during a recent trip

THE discouragement and low morale which recently existed on some of the Federal reclamation projects in the West have been supplanted by a spirit of confidence and optimism, according to a detailed special report made recently by Reclamation Commissioner Elwood Mead to Secretary Work of the Interior Department.

Commissioner Mead declared that the gloomy attitude prevailing in the past has disappeared and that water users' organizations on the various projects were ready to cooperate with the Government in any constructive program for improvement of conditions. His report to the Secretary follows in full:

Hon. HUBERT WORK,
Secretary of the Interior.

DEAR MR. SECRETARY: On July 21 I returned to Washington from a five-weeks' visit to reclamation projects of the Northern and Pacific Coast States, covering much the same territory embraced in your visit of last year.

The outstanding impression of the inspection just completed is the remarkable change in the attitude of the people on reclamation projects, both with regard to their own prospects and their relation to the Interior Department and the Bureau of Reclamation. Last year was noted for the low morale on a majority of the projects visited. There had been four moratoriums in payments, which had not relieved the people of their debt, but had increased the amount of the payments which would be required in the immediate future. There was uncertainty as to whether settlers would be relieved from the payment of charges on land which had proven to be unproductive, their apprehension being based on the language of the reclamation act which required the entire cost of a project to be repaid.

This anxiety and apprehension were aggravated by the fact that the general agricultural depression had made it difficult for them to meet their individual obligations, without being called upon to pay those of anyone else. It was true, at that time, that a commission was engaged in gathering information as to the ability of settlers to pay, and the bureau was making a scientific study of the soils of different projects to determine the areas of fertile and productive land, but no one could forecast what the conclusions would be or what action Congress would take.

The result was not only a gloomy attitude on the part of water users, but in many cases very bitter feeling toward the Interior Department and the Reclamation authorities. This was not improved by the fact that in order to check a tendency toward repudiation, manifest on some projects, it was necessary for both you and myself, wherever in contact with settlers, to call attention to their obligations and the necessity for keeping faith with the Government as the only means by which reclamation would be justified and the reclamation policy continued.

> *"A new spirit of confidence has supplanted the old feeling of discontent and distrust which has existed for many years. Settlers have entered into the cultivation of their farms with renewed vigor, and indications are that the largest crops on record will be produced during the coming season. Prices for farm products are satisfactory. This is particularly true of sugar beets, which are becoming the principal crops on many Government projects. Little doubt exists that the present year will bring the greatest prosperity in the history of Federal reclamation."*—Hubert Work, Secretary of the Interior.

This year water users on every project informed me that there was an entirely different feeling from that which existed last year. Settlers are confident; the irrigation organizations are ready to cooperate with the department in any constructive program for improvement of conditions. As my visit was mainly to the older projects and its purpose to confer with the irrigators and their organizations about improvement of canals, building of drains, settlement of unoccupied lands, and the working out of crop and marketing programs which would stabilize conditions and increase revenues, this changed attitude was of the greatest value.

Last year it was necessary for both you and myself to deal mainly with the obligations of reclamation projects and the necessity for meeting those obligations. This year it was not necessary to refer to those matters. The action of Congress, largely the result of your continued efforts to promote the legislation passed in the adjustment bill, has taken from settlers the threat of having to pay the water charges on unproductive land. It has also wiped out debts which water users did not believe they should be called upon to pay; it has extended the time of payment, and so overcome the adverse influence of temporary hard times in agriculture. Settlers everywhere were friendly to the department and planning for the future.

In order that you may understand the difference in the character of the conferences had last year and this, and also the character of the work which it is proposed to do to improve conditions on different projects, I will deal separately with the projects visited in the order in which they were visited.

ECHO RESERVOIR, UTAH

A conference was held at Ogden, Utah, with officers of this bureau and the committee engaged in securing subscriptions for water rights in the Echo Reservoir. The plans for this construction are completed. Contracts can be let whenever subscriptions have been received for 80 per cent of the water in the reservoir. Owing to the large number of farmers and the diversity of irrigation interests that have to be coordinated, it has taken more than a year to secure the necessary subscriptions, although the local committee has worked assiduously during the entire time. Belief was expressed that the present shortage of water would result in securing the necessary subscriptions, which has since been accomplished.

TRUCKEE-CARSON IRRIGATION DISTRICT AND SPANISH SPRINGS DIVISION OF THE NEWLANDS PROJECT (NEVADA)

At Lake Tahoe I met the attorney for the Truckee-Carson irrigation district and engineers making surveys for the Spanish Springs division of the Newlands project. Although Nevada is suffering from an acute shortage of water, it is believed that by the exercise of economy and by rotation in delivery all the crops under the Lahontan Reservoir will be saved. Arrangements were made for pumping from this reservoir to supply a part of the irrigators under the Truckee Canal, while those depending entirely on the stored water in Lake Tahoe would be in a better position than heretofore, because the water in the river is now being distributed by a water master, in accordance with the

provisions of a recently rendered court decree.

Different conferences showed that there exist in Nevada misgivings about the feasibility of the Spanish Springs project. These arise out of the low stream-flow records of the last three years and the large private development on both the Carson and Truckee Rivers in recent years, which makes an increased demand on the natural flow of both streams, and hence lessens the amount of water available for storage. During the past three years it has not been possible to fill completely either of the storages at Lahontan and Lake Tahoe, and little or no benefit would have been derived from the Spanish Springs Reservoir if it had been completed.

The conferences showed a belief that before entering on this large and costly development further studies should be made to determine whether it would not be better to build a small storage in the main channel of the Truckee or some of its tributaries, which would provide a dependable water supply for the lands under the Truckee Canal, leaving the irrigation of Indian and other lands until there is a better understanding of the amount of the available water supply and the needs of private irrigators.

ORLAND PROJECT (CALIFORNIA)

One of the matters dealt with at Orland was the construction on the Stony Gorge Reservoir, which is to provide an additional water supply for the 20,000 acres of land in this project. The construction of this work will insure an ample water supply for the entire area. It will, however, impose an added burden of construction costs on all the land, and this makes it necessary that all of the land be brought under intense culture.

Thus far, for various reasons, this has not been done. On the contrary, only about 15,000 acres of the 20,000 acres are now being irrigated. The 5,000 that is unirrigated is equal in quality to the other, but the shortage of water for the last three years and the falling off in the demand for land by settlers have caused its owners, while meeting their payments, to postpone active efforts to secure settlers.

Now, with an adequate water supply assured, with the suitability of the lands for intense culture under irrigation fully demonstrated, the owners of the unirrigated land are ready to cooperate with the Government in a carefully thought out program of settlement and farm development. The details of this program have not as yet been worked out, but are, in a general way, to include the following:

1. Division of the land into suitable farms.

2. An appraisal of the value of these farms, without regard to ownership, so that the price will be based on their productive value and all, as nearly as possible, be made equally attractive.

3. A small initial payment and a long period, with a low rate of interest, in which to complete payments. At the conference held with these water users it appeared probable that they would adopt the payment plan of the Federal Land Bank, which is 34½ years, with amortized payments drawing interst at 5 per cent.

4. Owners are to level the land and make it ready for irrigation; settlers to be dealt with by a committee of three, made up of a representative of the Reclamation Bureau and two representatives of the landowners.

5. Minimum capital of settlers to be $2,500.

> *"The legislation adjusting payments on Federal reclamation projects enacted by Congress on the recommendation of the Interior Department has brought relief to irrigation farmers of the West. Over $14,000,000 has been charged off the different projects for unproductive land as a definite loss. Another $13,000,000 in payments has been suspended as a probable loss. The result has been that these settlers will no longer be called upon to bear burdens they can not carry."*—Hubert Work, Secretary of the Interior.

6. The Reclamation Bureau agrees to issue a descriptive booklet containing a map of the farms for sale, a list of prices, and explaining the views of the department as to the opportunities which are presented. It is also proposed, in connection with similar development on other old projects, to advertise these opportunities under some plan approved by the Secretary in accordance with the provisions of the reclamation appropriation.

OKANOGAN PROJECT (WASHINGTON)

The experience of the last 10 years has shown that the water supply of this project is not sufficient. During last winter the early rainfall seemed to indicate that there would be an abundant supply this year, but later it became apparent that there would be another shortage. After irrigation began and near the adjournment of Congress the bureau was asked to install an emergency pumping plant, but there was not time enough to secure an appropriation for this. My visit to the project with the chief engineer was to confer with the water users about securing next winter an emergency appropriation for a pumping plant from the Okanogan River to supplement the water supply from other sources.

It was feared there would be discouragement and loss of morale on this project, but instead it was found that the landowners on the southern end of the project had already made arrangements for installing three pumping plants of their own. The $40,000 required to erect one of these was all subscribed in one day, which shows that that section of the project is self-reliant and in a flourishing financial condition. The northern part of the project has suffered more from shortage, because it has fewer old water rights and is not in a position to install its own pumping plant.

An estimate will be made of the cost of a plant to lift 30 cubic feet a second, pumps to lift 20 cubic feet to be installed at the outset. The irrigators have agreed to operate this plant, collecting their own operation expenses, and to meet the construction payments under the terms of the reclamation act. Plans and estimates for contract will be submitted to you for your approval at a later date.

Notwithstanding the great expenses which irrigators have had to incur to secure adequate water for the last three years the farmers on this project are in a prosperous condition. One of the water users, who drove me over the project in a Buick sedan, explained that he estimated his apple crop last year at 1,200 boxes to the acre. It turned out to be 1,700 boxes, and this excess enabled him to buy a new car. The building of three pumping plants by private owners, the hopeful, constructive attitude of the other irrigators, and the willingness to assume the responsibility for the expenses of operation and to pay all construction charges are in gratifying contrast to the discouragement encountered on so many projects last year.

YAKIMA PROJECT (WASHINGTON)

The Yakima project had good crops and good prices in 1925. The prosperity which this brought is reflected in the purchase this spring by irrigators on this project of 1,300 motor cars. Conferences were had with representatives of the Tieton, the Sunnyside, and Outlook districts relative to betterment of canals or extension in time of payment, but in these conferences the attitude of the water users was hopeful and constructive. Criticism and bitterness toward reclamation officials, last year so conspicuous, were nowhere in evidence.

KITTITAS DIVISION, YAKIMA PROJECT (WASHINGTON)

On the 11th of July the State of Washington celebrated the beginning of construction of the Kittitas division of the Yakima project. Sixty thousand acres of this project are privately owned. Conferences were had with owners, representatives of the Northern Pacific Railroad Co., and the district board about plans for subdividing, settling, and developing the irrigated area under a unified plan.

As a result, the Northern Pacific will offer its lands in the upper part of the project for sale at once at prices fixed by the Interior Department appraisers. Much of this land has to be cleared, and the railroad company has agreed to sell the settler one half of what he desires and to reserve the other half for three years without any charge for the option but with the condition that before the second half is sold the first half must be cleared and ready for cultivation. The railroad has a division point at Cle Elum. Many of the employees desire to get a piece of land for a home and can provide the money out of their wages to develop their farms.

At the lower end of the project are 15,000 acres, belonging in part to the Government, in part to the railroad, and in part to the State and to private owners. I talked to some of the private owners about a cooperative plan for location of roads, without regard to land boundaries, and for the working out of a plan under which all of this land will be cleared and made ready for settlement, the cost to be added to the selling price of the land. We can do this with the Government land out of the $300,000 provided for such development by the State of Washington. The following tentative program was discussed:

1. The bureau to prepare a large-scale topographic map of the area.
2. The working out of an agreement for coordinated development.
3. Uniform selling contract with not less than 20 years for paying for land.
4. Clearing and leveling land for settlement.
5. Plans for houses and farm buildings.
6. A competent adviser about farm program and farm development.

If this neighborhood agreement is worked out, efforts to organize other sections of the project in the same way will be taken up, and it is hoped that before the four-year period of construction is ended a complete program of settlement will have been thought out and agreed to by the landowners. Practically all of the Government land is included in the 15,000-acre area before referred to.

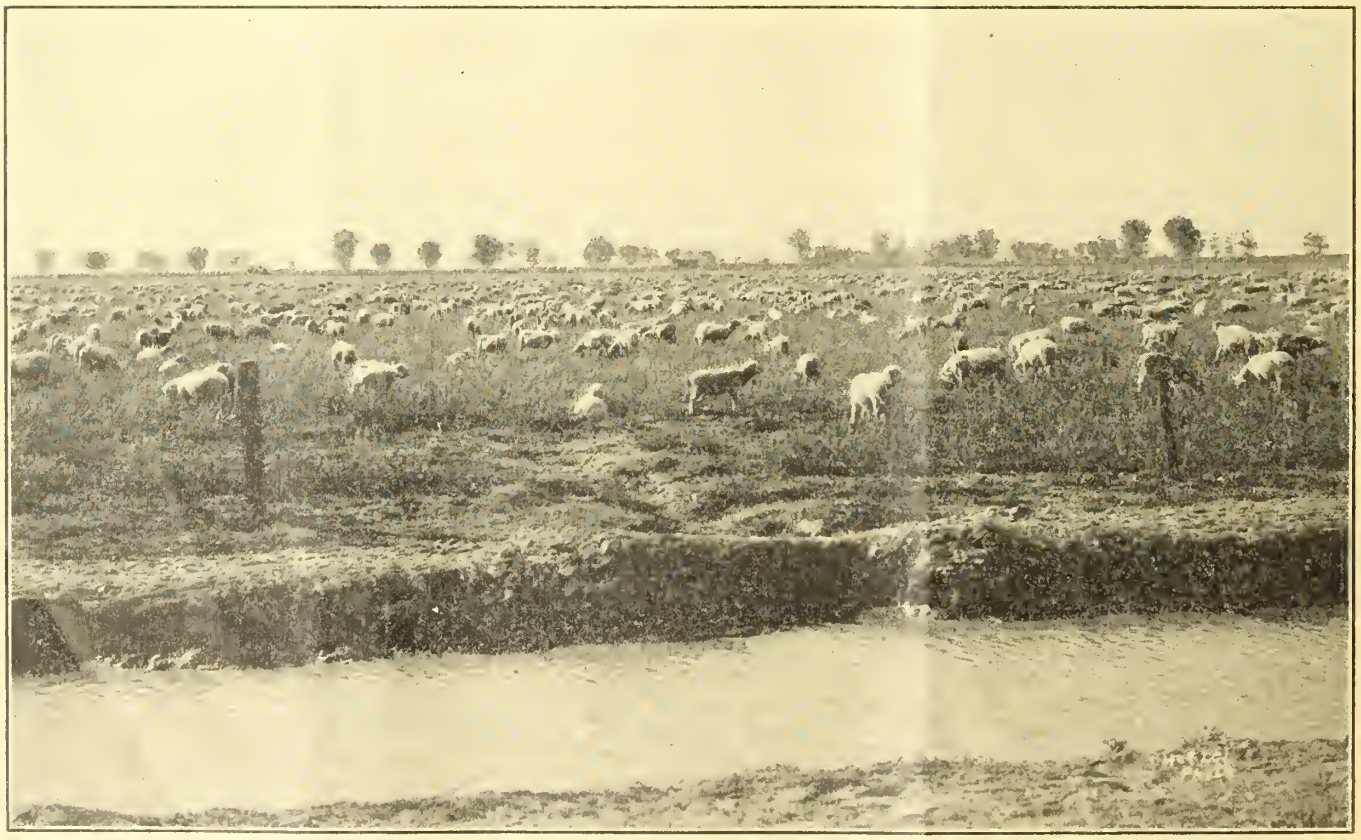
The hearty approval of the development department of the Northern Pacific Railroad and their assured cooperation are due to a realization that an automatic demand for land does not exist.

All of these plans have one weakness. Many worthy settlers will not have capital enough to complete their development. Access to credit of some kind will have to be provided.

HERMISTON, OREG.

The Umatilla project was visited July 7 and 8, at which time an inspection was made of the McKay Dam now nearing completion. The McKay Reservoir has been built to provide a supplemental water supply for the Umatilla project and for lands under private enterprises that have an inadequate supply. Contracts for a part of the water of this reservoir under Warren Act agreements have been made with the Stanfield and Westland districts, which are not Government undertakings.

Representatives of both these districts appeared at Hermiston to urge that the Government take over their projects, or at least advance money for the reconstruction of their works. It was explained to them that the obligations growing out of appropriations by Congress for new



Many water users find that fattening sheep for market is a profitable undertaking (see page 162)]

works and the need for completing the older ones made it impossible to make any promises for assistance of the kind required.

Two contracts have been negotiated this year under the provisions of the fact finders' and adjustment acts, whereby the operation of the two divisions of the Umatilla project has been taken over by the water users, and at the time of my visit they were under local management and control. The contracts have not been completed and can not be until the accounts have all been verified, so as to determine the exact amount of the districts' debt to the Government, and until additional surveys have definitely located the areas of class 5 and 6 lands, for which construction payments will not be required.

COLUMBIA BASIN INVESTIGATIONS

While in Washington I had conferences, at Seattle and at Spokane, with representatives of the department of conservation and development of the State of Washington and with the Columbia Basin League. These conferences were held to consider the expenditure of $22,000 appropriated by the State of Washington and $25,000 appropriated by the Congress of the United States for investigations to determine how the waters of the Columbia River should be allocated between the States of Montana, Idaho, Washington, and Oregon, and for further investigations needed to determine the feasibility of the Columbia Basin project. At the second of these conferences, held at Spokane on July 12, the State engineer of Oregon and deputy State engineer of Idaho were present to consider the allocation of the water, and a subsequent conference, on July 14, was held with the State engineer of Montana.

All engineers' reports regard Lake Pend Oreille as the most feasible storage for the Columbia Basin project. If used for this, the height of the water level in the lake will have to be raised and compensation will have to be paid the landowners around the lake whose property would be flooded.

At the conference I agreed to submit for your approval an allocation of $5,000 from the sum appropriated by Congress to pay for an appraisal of the damages to be caused by raising the lake level and for compensation to be paid, the State to allocate an equal sum from its appropriation.

I agreed to recommend an allocation of $15,000 from the appropriation made by Congress for a study of the economic conditions which will control the settlement and development of the project lands. The representative of the State of Washington agreed to recommend that the State allocate and expend from its appropriation $15,000 to make a survey of the power possibilities of the project and the revenues which might be expected to come from their development.

The economic survey to be made with the funds appropriated by Congress would include, in part, the selection of three typical areas of 10,000 acres each in the area to be reclaimed; the gathering of information on these areas as to the ownership of the land in each area, the price at which the owner would sell to the Government if it carried out the recommendations of the last report and purchased the land, or the price at which the owner would sell the land, as small farms, to settlers direct. Inquiries would be made to ascertain what use is being made of these areas at present, what use can be made of them without irrigation, what it will cost to level and prepare the land for irrigated culture, the crops which could be grown, and a supplemental study to determine the places where these crops could be most profitably marketed, the probable demand, and, generally, the influences which would determine the effect of the reclamation of this large area on the welfare of agriculture and the Nation in general. I therefore submit for your approval the following:

1. Allocation of $5,000, to be used with an equal sum provided by the State of Washington, to ascertain what will be the probable cost of utilizing Lake Pend Oreille as a storage for this project.

2. That $15,000 of the sum appropriated by Congress be expended in the economic survey above outlined to determine how the privately owned land can be settled and improved.

LOWER YELLOWSTONE PROJECT (MONTANA)

On July 14, in company with Chief Engineer Walter and Director of Recla-

Potatoes on raw land on the North Platte project, Nebraska-Wyoming (see p. 151)

mation Economics Kreutzer, the Lower Yellowstone project was visited. The department has agreed to contract with this project for an extension of construction payments in accordance with the adjustment act, but the contract is conditioned on the department being given options as selling agent on 8,000 acres of land on satisfactory terms and prices, so that the bureau can actively assist in securing settlers.

The visit to this project shows the necessity for a new and different type of settlement. After being operated at a loss for 15 years, only one-third of the project was irrigated last year. This year the acreage record will not be much better. Yet I saw as fine crops of irrigated grain, alfalfa, and sugar beets on this project as were seen on any project, but I also saw large areas of grain and lesser areas of sugar beets and alfalfa burned up and ruined because the dry farmers on this project refuse to irrigate, although the canals were and had been full of water throughout the season and no one had been denied water.

Our contract with the Lower Yellowstone project provides that $50,000 be raised by July 15, in order that the deficit for operation and maintenance of previous years should be avoided, it being agreed that it should be operated this year on contributed funds. The money was raised and paid on time. There was some protest about advance payments on the part of a few, but the great majority of the people on the project, and especially all those who are looking to its betterment, heartily approve of the contract and the new payment policy.

Prior to the meeting with the people of the project a conference had been had with Mr. Hughes, head of the colonization department of the Northern Pacific Railway, and with a representative of the Holly Sugar Co., regarding a uniform land-selling contract for all the land on which options are to be taken. The following conditions as to options were approved: Time of payment to be 20 years; interest, 6 per cent; payments to be amortized; cash payment of 10 per cent; all approved settlers to have $2,500 in money or equipment.

These are to be submitted to those who have given options on their lands. A new contract is being prepared and will be reviewed by representatives of the Great Northern and Northern Pacific roads and the committee obtaining options before it is sent out.

Meantime Mr. Kreutzer, with the aid of competent soil experts, is appraising the value of the improvements and of optioned farms to determine whether the prices asked can be approved and recommended to settlers. I have advised Mr. Kreutzer that in appraising he should fix the value of the land on the assumption that all taxes and irrigation charges were paid. From this should be deducted the taxes due the county and State and operation and maintenance charges due the Government. The settler will have to assume the obligation to pay these. If these options are worked out, the Northern Pacific and Great Northern roads have agreed to put men in the field to solicit settlers for the project.

The solvency of the project depends on more settlers who are irrigation farmers. The contract we are making with the project will be worth nothing unless this is done. Payments will not be made. I am very anxious, therefore, through the coordinated action of landowners, railroads, and other interests, to place 100 new settlers on this project before irrigation begins next year.

I have discussed with the railroads the running of a land seekers' excursion some time in October. If this is done the railroad advertising should be supplemented by notices from this department in papers like the Country Gentleman, Farm and Fireside, and Hoard's Dairyman. Meantime we would prepare pamphlets on both projects, telling of the opportunities afforded settlers. These pamphlets would be actively circulated by the railroads and the beet-sugar people and the local development association.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

In company with Mr. Kreutzer, Director of Reclamation Economics, an inspection of the Belle Fourche project was begun on July 16 and completed on July 18. During this period a number of conferences were had with the irrigation district board and with others interested in the development of the project. This included general officials of the Chicago & Northwestern Railroad, representatives of the Great Western Sugar Co., of mortgage and trust companies that have loaned money on farms in the project and had to take them over under foreclosures, and representatives of the Department of Agriculture. On June 17 there was a picnic held at the experiment farm on the project, attended by about 5,000 people. The sanguine, constructive attitude manifested on other projects visited was clearly apparent here.

The conferences dealt with the steps which should be taken to complete the settlement and agricultural development of this project. If this is done all problems of reclamation payments will be solved. The crops on this project are excellent, although the sugar beets showed a shortage of labor that has prevented proper cultivation and thinning of some crops.

The outstanding need is settlers who will be good farmers. The 65,000 irrigable acres of the project are divided into 965 farms, of which 119 are entirely idle and 531 are unoccupied, having neither owner nor tenant living on them. The highest average yield of sugar beets obtained in this country last year was obtained on this project. The average value of the crop was $133 an acre, and the average value of potatoes was $197 an acre. Cucumbers were a profitable crop last year, the average value being $133.50 an acre. The maximum yield of alfalfa was 6 tons to the acre, while the average was only 1.6 tons, this low average being the result of neglect to irrigate or poor cultivation by tenants.

The attempt of tenant farmers to cultivate more land than they can farm properly and the tendency to depend too largely on rainfall by those who find it difficult to pay for water, or who have prejudices against doing so, have operated to hold back what can be made one of the best of our Federal reclamation areas. A contract satisfactory to water users and to the Government has been negotiated which will give them the benefit of the long-time payments under the adjustment act and cover into construction payments delinquent when the contract is finally approved. Owing to the need of settlement and development under this arrangement, there will be a preliminary period before full payments are to begin.

One condition of the contract is that the Government be given options as a selling agent for 10,000 acres of land, the idea being to be sure of having farms and to prevent inflation of prices if the Government and other agencies enter into an active program of settlement. Options on the necessary area of land have been secured, but the land has still to be appraised and an agreement reached as to terms of purchase.

The conditions of sale and closer settlement submitted to the Lower Yellowstone project were discussed at Belle Fourche, and will be submitted to those who have given options on their land.

Mr. Kreutzer remained on the project to assist in an appraisal of the farms and to make sure that prices have a correct relation to productive values. A progress report of this appraisal of 21 farms, made by Mr. Kreutzer, states that the appraisers were agreeably surprised with the improvements found on, and the general desirability of, many of these farms.

Settlers here will not have to take raw land. On many of the farms that will be

(Continued on p. 151)

A Letter to Doctor Mead from Australia

From William Cattanach, Chairman of the State Rivers and Water Supply Commission, Victoria, Australia

I READ with great interest the reports and papers that we have received from your side, and it is undoubted that your problems are both numerous and complicated. The greatest difficulty is, of course, the attraction of cities all over the world, not only on account of the wages paid but on account of the conveniences which at one time were looked upon as luxuries, but are now considered by almost everyone as essentials to one's well-being. It may seem a platitude to say so, but the only thing, in my opinion, is to keep pegging away to try and make country life as attractive as possible, and you are doing great work in endeavoring to supply the irrigation settlers with money at reasonable rates and under reasonable repayment conditions. You will remember this was the most attractive feature of the Victorian Closer Settlement, and I feel sure that without it there would be a great falling off in land settlement. So far there is a reasonable demand for irrigation blocks.

While I write this, however, I want to say again, and perhaps this is also a platitude, that the whole success of our and your schemes will depend upon personality. While I agree with you that the man with $1,500 has, generally speaking, a better chance than the man with $250, yet I would sooner take the man with the less amount if he has a personality which will override difficulties and which will enable him to stick it out. These men are hard to find, but I believe that it is not by any means time wasted for myself or some one with a reasonably good knowledge of human nature to see the applicants and put them through a pretty close examination as to their past career, their future aspirations, and their willingness to follow the advice given by the supervisors.

There are a great number of problems connected with irrigation which I think we should all turn our attention to. I think the first one is whether there could not be a wholesale reduction in the amount of water used. I am finding that our most successful orchardists are doing now with only about 5 inches of water, and they are producing sounder and better flavored fruit than those who are putting on 12 inches or more. In the same way, I believe to be successful agriculturally a much less quantity of water could be used in connection with fodder crops, and notwithstanding experiments which are quoted both from your side and from this I believe that more satisfactory results would come from a reduced quantity being used. Another problem that is giving us great trouble is the question of drainage. I have insisted upon measuring pits being sunk in our various irrigation areas, and it is undoubted that in many cases the water table is surely rising. I have often wondered as to whether this accounted for some of the Old World irrigation schemes going out. I am satisfied in any case that it is a very difficult problem here and will need strong action to combat it; of course, on the other hand, the less water used the less acute would the drainage problem become. Another great problem here is the question of marketing. This may not be nearly so acute with you with the large population in your own continent, but in Australia, with a handful of people, it is very difficult sometimes to find outlets, and again these outlets are distant so much further than are yours. I quite recognize that this last phase may right itself, because population should increase while, on the other hand, the irrigation possibilities are limited by the water available.

Confidence Replaces Discouragement

(Continued from page 150)

offered the land has been leveled, fences built, and substantial buildings erected. Many have grain and alfalfa growing on them, so that the settler who buys here will secure a farm that is a going concern. Where farms have been listed at a higher price than this bureau regards as warranted, the owners will be required to reduce their prices. When the options have been completed, the railroads, local authorities, and the Government will enter into a campaign of publicity to secure settlers.

There were interesting discussions at the Belle Fourche conferences regarding the kind of agriculture and crop program which should be adopted. It is a country well suited to dairying and to the raising and fattening of sheep. On the experiment farm 40 ewes and 50 lambs were being fattened on 5 acres seeded to sweet clover and alfalfa. The raising and fattening of lambs on the project and the excellent range surrounding it has unusually good opportunities, and it is an attractive kind of farming to people who enjoy livestock. The same opportunities exist with regard to dairying.

A portion of the project is unusually well suited to growing sugar beets. It was agreed, therefore, that in the efforts to secure settlers these agricultural possibilities should be stressed and attention called to them in some of the leading dairying and stock-raising districts of the country.

If a considerable percentage of the unoccupied or unirrigated lands of the Lower Yellowstone and Belle Fourche projects can be settled with the right type of farmers by the beginning of the next irrigation season, it will have placed two Federal reclamation projects on a sound financial footing and pointed the way to similar development on other projects.

There is equal need for similar efforts on the Fort Laramie division of the North Platte project and on the irrigable lands of the Riverton project.

ELWOOD MEAD,
Commissioner of Reclamation.

Potatoes on Raw Land North Platte Project

The illustration on page 149 shows a crop of potatoes being raised on raw land on the Fort Laramie division of the North Platte project in Wyoming. The land on which the crop is being raised is Government land and was leased in the spring to W. M. Helmreich, of Huntley, Wyo., for agricultural purposes.

The sod was first disked twice and then plowed to a depth of 8 inches. The crop was planted between May 1 and May 15 and 10 bushels per acre of Irish Cobbler seed were planted. The seed was obtained from the Red River Valley in North Dakota.

The illustration shows the condition of the crop on July 10, at which time the first irrigation had just been completed.

The soil is a Rosebud silt[illegible]oil and is classified as class 1[illegible] Helmreich has 60 acres in th[illegible] estimates that the yield shou[illegible] imately 350 bushels per acre[illegible]

Project Feasibility Basis For Construction, Says Attorney General

In letter to Representative Sinnott and Senators McNary and Stanfield, of Oregon, the action of the Secretary of the Interior toward construction of the Baker project is upheld

IN a decision made public recently the Attorney General ruled that the Secretary of the Interior is not compelled to expend appropriations made by Congress for construction of new reclamation projects unless he is certain of their feasibility, their adaptability for settlement, and repayment of their costs to the Government.

The decision was rendered in connection with the proposed new Baker project in Oregon. Recently Senators Charles L. McNary and Robert N. Stanfield and Representative N. J. Sinnott, of Oregon, contended before the Attorney General that the Secretary of the Interior was obliged to build the project, Congress having made appropriations for it in five consecutive appropriation acts.

The Attorney General in his ruling calls attention to other provisions of the appropriation acts authorizing the Baker and other projects, which provide for the making of contracts with irrigation districts for the repayment of construction, operating, and maintenance costs within a fixed term of years. These contracts under the law must be confirmed by a court of competent jurisdiction. As a result of these terms, the Attorney General points out, the Secretary of the Interior must exercise due diligence and due care for the interests of the United States in making each of these contracts, as to wording and probability of whether the project is of such a nature that it will enable the promissor in the contract to financially perform the terms. He also referred to the new reclamation law passed by Congress two years ago, which specifically provides that construction of a new reclamation project shall not be undertaken until the Secretary of the Interior has certified in writing that it is feasible. The decision contained in a joint letter to Senators McNary and Stanfield and Representative Sinnott follows in full.

Hon. N. J. SINNOTT,
Hon. CHARLES L. MCNARY,
Hon. ROBERT N. STANFIELD,
Committee on Public Lands,
Washington, D. C.

GENTLEMEN: Your esteemed favor of July 13, 1926, received, and it has had painstaking and thorough attention given to it. You state:

We feel that the manifest purpose of Congress in making the fifth appropriation for the project—namely, the purpose to have the project constructed—should not be frustrated by interpretation until you have carefully considered the record relating to this fifth appropriation.

In connection with this matter, the letters and documents you have submitted have been carefully considered.

Looking at the appropriation act passed for the year 1927, being Public, No. 206, Sixty-ninth Congress, I find that paragraph 1, found on page 30 thereof, provides:

No part of the sums provided for in this act for the Sun River, Owyhee, Vale, and Baker projects shall be expended 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 irrigation districts organized under State law providing for payment by the district or districts of the cost of construction, operating, and maintaining the works during the time they are in control of the United States, such cost of construction to be repaid within such terms of years as the Secretary may find to be necessary, in any event not more than forty years from the date of public notice hereinafter referred to, and the execution of said contract or contracts shall have been confirmed by a decree of a court of competent jurisdiction. Upon such confirmation of such contract as to any one of such projects, the construction thereof shall proceed in accordance with any appropriations therefor provided for in this act.

What Congress intended to do is expressed very clearly, and it is provided that upon the confirmation of the contract "as to any one of such projects," then, and not until then, shall the construction "proceed in accordance with" appropriations provided for; that a contract shall be made; that after its making it shall meet with the approval of a court of competent jurisdiction; and that in no event shall more than 40 years elapse before the cost of constructing, operating, and maintaining of the works shall be repaid to the United States.

The part of the law providing for the making, approval, and certain terms to be contained in the contract was enacted in 1924, and has been by Congress clearly, fully, and explicitly brought forward and incorporated into the 1927 appropriation act. Distinctly, Congress provided, as a condition precedent to the expenditure of the money provided for, that there should be such a contract made and thereafter confirmed by "a court of competent jurisdiction."

Beyond the shadow of a doubt, Congress has said that the cost of "constructing, operating, and maintaining the works during the time they are in control of the United States" should be paid back to the United States by the contracting promisor within "40 years from the date of public notice" referred to in the bill.

In the making of the contract, and the submitting of evidence to the court of "competent jurisdiction" in order to get that court to "confirm" the contract, the Secretary of the Interior, or any subordinate official under him, who should be charged with the duty of presenting all the facts relevant to such court of "competent jurisdiction," in order to obtain the confirmation of the contract by such court, would be derelict in the performance of his duty if he did not present all of the available information that would be of assistance to the court so as to help the court to determine whether or not the contract presented for its confirmation was such a contract as would, with a reasonable degree of certainty, provide for and obtain the repayment within 40 years to the United States of the moneys expended by it in the "constructing, operating, and maintaining of the works." In my opinion discretion should be exercised both by the Secretary of the Interior in making of the contract and the court of "competent jurisdiction" in confirming the contract, to see that not only the terms of the contract provide for the return of the money within the specified time but that the contract was made with parties that in all probability would be able to financially carry out the terms of the contract and make the payments provided for therein.

If in expending the moneys provided for by this appropriation for the construction of an irrigation project a place should be selected where there could be made no water available for irrigation purposes, it would be apparent that no contract could be entered into by the Secretary of the Interior that would, with any degree of certainty, provide for the return to the United States within the time limited the cost of "constructing, operating, and maintaining the irrigation works." Under such circumstances no party financially responsible would agree to make the necessary payments. In order for the Secretary of the Interior to exercise due diligence and have due care for the interests of the Government of the United States in the making of a contract such as must be made under the

terms of this act, it will be necessary for him not only to look at the wording of the contract but to the probability of whether or not the project is of such a nature that it will enable the promisor in the contract to financially perform the terms as expressed in the words thereof.

That Congress intended that these matters should be thus handled is made more apparent and conclusive by its failure to repeal that part of the act of June 17, 1902, which reads as follows:

That upon the determination by the Secretary of the Interior that any irrigation project is practicable, he may cause to be let contracts for the construction of the same in such portions or sections as it may be practicable to construct and complete as parts of the whole project. * * * He shall also determine the charges which shall be made per acre upon said entries, and upon lands in private ownership which may be irrigated by the waters of the said irrigation project, and the number of annual installments, not exceeding ten, in which such charges shall be paid and the time when such payments shall commence. The said charges shall be determined with a view of returning to the reclamation fund the estimated cost of the construction of the project and shall be apportioned equitably.

If it were at all necessary to further search in an effort to find the intent of Congress, it is found in that part of the act of December 5, 1924, which reads as follows:

No new project or new division of a project shall be approved for construction or estimate submitted therefor, by the Secretary, until information in detail shall be secured by him concerning the water supply, the engineering features, the costs 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.

That part of the appropriation act of the Sixty-ninth Congress to which you have called my attention provides:

No part of the sums provided for in this act for the Sun River, Owyhee, Vale, and Baker projects shall be expended for construction purposes until a contract or contracts * * * shall have been let.

To my mind it is inconceivable that Congress should have intended that the vast amounts of money appropriated for the Sun River, Owyhee, Vale, and Baker projects were to be expended without any regard to the financial responsibility of the contracting parties, the kind of a contract that should be made; that neither the Secretary of the Interior nor anyone else should inquire into the feasibility of the projects nor determine what payments or when the payments should be made, the adaptability for actual use and settlement of the lands to be irrigated, and whether there would be, in fact, water to irrigate with. For many years a public policy has existed familiar to Congress and to all other parties experienced in dealing with governmental irrigation activities in the West, and that policy is expressed in the law quoted. There is no sudden reversal of this policy to be found in any enactment of Congress. The law applicable to the Baker project is the same as that applicable to the Sun River, Owyhee, and Vale projects. All the provisions of the law heretofore referred to were wisely and judiciously incorporated into the statutes. That Congress intended to pursue the same policy and has exercised the same degree of care and caution that it has provided for in the past is emphasized in the wording of the act under consideration, wherein it is provided:

Upon such confirmation of such contract as to any one of such projects, the construction thereof shall proceed in accordance with appropriations therefor provided for in this act.

No contract, then no confirmation; no confirmation, then no contract; and when you go back into the law and read the provisions above quoted, there is left no chance for uncertainty as to many of the conditions Congress intended the Secretary of Interior should take into consideration before making a contract.

In determining the intent of Congress in this matter I have looked to the plain and unambiguous langauge of the statutes for my guidance.

Very truly yours,

(Signed) JOHN G. SARGENT,
Attorney General.

6330—26——2

Irrigation in India Covers 50,000,000 Acres

A recent report of the Bureau of Foreign and Domestic Commerce states that the total area now under irrigation in India is nearly 50,000,000 acres. About 23,000,000 acres are irrigated by Government and private canals, 7,000,000 acres by artificial pools called tanks, and more than 14,000,000 acres by wells.

"Irrigation works in the Punjab have resulted in the opening to cultivation of large areas of great fertility which had hitherto been unsuitable for development because of the lack of sufficient rainfall. Such irrigation projects have resulted in what are known as canal colonies; and the result of this development may be gauged from the fact that Lyallpur, the capital of the upper Chenab colony, now has a large export trade, and the population of the area of which it is the center has increased from 8,000 to 800,000 in the course of 10 years.

"Numerous irrigation projects have been considered by the Indian Government; the most important and ambitious of these is known as the Lloyds (Sukkur) barrage and canal projects, located in Sind Province. This canal is expected to open up to cultivation considerable areas in that Province. The project consists of seven new canals and a barrage, or dam, to span the River Indus at a point 3 miles below Sukkur. This is one of the largest irrigation projects undertaken, and the combined lengths of the main canals will total 805 miles, of the branch canals 766 miles, and of the distribution system 3,724 miles.

Raking alfalfa on the Yakima project, Washington.

The Owyhee Irrigation Project in Oregon and Idaho

The second of a series of articles describing and analyzing the plans and conditions under which the Department of the Interior is to develop the new projects for which money was appropriated by the Sixty-ninth Congress

THE Owyhee project proposes the irrigation of lands in Oregon and Idaho along the southern and western side of Snake River Valley from a line south of Caldwell, Idaho, to the vicinity of Weiser, Idaho. Based on recent incomplete land classification for appraisal of lands at present without irrigation facilities and on meager data furnished by owners of lands commanded by existing irrigation works, the irrigable area of agricultural land, without deduction for rights of way, is estimated at 124,000 acres. Of this area, 13,000 acres under the Owyhee Canal are receiving a partial supply by gravity from Owyhee River and require supplemental storage only, and 41,000 acres additional are included in districts wholly or partially supplied by pumping from Snake River and for which a full gravity supply would be provided to eliminate present excessive pumping cost.

SOURCE OF WATER SUPPLY

The proposed source of water supply is the Owyhee River, with an annual run-off of 298,000 to 2,309,000 acre-feet and an average of 1,000,000 acre-feet. Diversion requirements for project lands are estimated at 600,000 acre-feet annually and can be fully met in most years with the aid of 600,000 acre-feet of storage capacity at Hole-in-the-Ground Reservoir site after allowance for 30,000 acre-feet of additional use by undeveloped projects above the reservoir and for reservoir losses. The unused portion of stream flow in years of high run-off would be unavoidable waste. With the above irrigation demand and facilities, available run-off records indicate one heavy and two light shortages in a period of 25 years. The diversion of 600,000 acre-feet annually is at the rate of 5 acre-feet per acre, and it is estimated will permit the delivery of 3.25 acre-feet per acre at the land.

Water for the Owyhee Ditch, commanding an irrigable area of 13,200 acres or about 11 per cent of the total project area, may be released under head of 230 to 304 feet and would permit development of considerable power during the irrigation season. As in many years no water may be safely withdrawn from the reservoir during the winter, the power output would be useful only for irrigation purposes. Plans for power development have not been considered nor included in the estimated costs.

HOLE-IN-THE-GROUND DAM

The dam for Hole-in-the-Ground Reservoir would be located in a canyon section of the Owyhee River about 20 miles above its mouth. The dam would have a total height from foundation to parapets of 360 feet and a top length of 600 feet; the water level would be raised 304 feet. The dam site is in a narrow gorge of felsite, and is well adapted to the arch type of dam proposed, which would contain 405,000 cubic yards of concrete.

The upper 70 feet of the reservoir, with a capacity of 595,000 acre-feet, would be used to regulate stream flow, the lower part serving to catch silt and as dead capacity to permit diversion of waters at sufficient elevation to reach the project lands.

THE DIVERSION TUNNEL

Aside from the small quantity of water to be released from the reservoir for diversion by the Owyhee Ditch, diversion of irrigation water from the reservoir would be by means of a concrete-lined tunnel about 15 feet in diameter and 3½ miles long, diverting from the reservoir, with the tunnel sill 230 feet above present water level. At the lower end of this tunnel diversion is made for the Succor Creek division, and the main canal continues for 4 miles. This section comprises 1½ miles of earth canal, with a bottom width of 30 feet and depth of 10 feet; 1,500 feet of concrete-lined tunnels; 300 feet of concrete siphon; 900 feet of high head steel siphon; 8,700 feet of concrete bench flume, with a width of 17 feet and depth of 11.5 feet, and the balance in concrete-lined sections. There will be no lands irrigated direct from the main canal. The main canal would feed the supply canals for the Succor Creek, Kingman, and Mitchell Butte divisions, the latter in turn feeding that for the Dead Ox Flat division.

From the end of the diversion tunnel in the main canal a concrete-lined tunnel, 10.2 feet in diameter and 4.7 miles long, would serve the Succor Creek division, which comprises principally the lands in and above the Gem irrigation district with an irrigable area of 42,000 acres. Beyond the tunnel the supply canal for this division continues for a total length of 68 miles largely in earth with easy construction.

SUPPLY CANALS

The supply canal for the Kingman division would have a length of 8 miles and would be largely in earth; lined sections, bench flumes, and siphons would aggregate 1,500 feet.

The supply canal for the Mitchell Butte division, comprising lands between Owyhee and Malheur Rivers, would divert from the end of the main canal. Within the first mile Owyhee River would be crossed with a steel siphon 1,600 feet long under maximum head of about 250 feet. The river crossing would be made on a steel bridge 350 feet long. In Mile 6 a concrete-lined tunnel 2,400 feet long would pass behind Mitchell Butte. The balance of the Mitchell Butte supply canal, with a total length of 63 miles, would be largely in earth and loose rock with few structures of importance.

The Dead Ox Flat division comprises lands north of Malheur River. The supply canal for these lands would start from the end of the Mitchell Butte division supply canal. In Miles 4 to 7 the Malheur River Valley would be crossed with a steel siphon 2½ miles long, under a maximum head of 250 feet. The balance of this supply canal, having a total length of 38 miles, would be largely in earth with no structures of importance.

THE ESTIMATED COST

Of the estimated construction cost of $18,000,000 for this project, including a small amount for drainage, about one-third would represent the cost of the reservoir.

The dam and main canal are now almost inaccessible and will require heavy expenditures for roads to facilitate construction. Aside from waters made available for the Owyhee Ditch from the start of construction on the dam, an expenditure of some $12,000,000, or two-thirds of the cost, will be required before water can be delivered to project lands.—*R. F. Walter.*

THE CONTRACTS

The act of Congress of May 10, 1926, Public, No. 206, making an appropriation for the construction of the Owyhee project, carries a requirement that the contracts for the repayment of the cost must be made with irrigation districts.

There are four irrigation districts embracing land in the proposed Owyhee

project, viz, the Slide irrigation district, the Payette-Oregon Slope irrigation district, the Owyhee irrigation district, and the Gem irrigation district. On May 28, 1926, the Secretary approved forms of contracts for execution with each of these districts. These forms of contract follow substantially the same pattern, and this summary will be confined to the proposed contract with the Owyhee irrigation district, the form of this contract being typical.

The proposed contract, after certain preliminary recitals, defines "old lands," "new lands," and "supplemental lands" of the project. Old lands are lands which have been receiving their water supply by pumping from Snake River, but which will receive their water supply from the Owyhee project after it is constructed, and which will use the project canal and reservoir systems. New lands, as the term indicates, will rely upon the project exclusively for their water supply and irrigation system. Supplemental lands have their canal system constructed at the present time, but will obtain stored water from the Owyhee project. The construction charge of the old lands is to be $15 per acre less than the construction charge for the new lands.

CONSTRUCTION PROVISIONS

The contract provides for the expenditure by the United States of a maximum of a million dollars toward the construction of a storage reservoir on the Owyhee River, known as the Hole-in-the-Ground Reservoir, a distribution system therefrom consisting of certain tunnels, a main canal and branch canals, laterals and structures required in connection therewith, and such drainage works as may be found necessary or desirable. This expenditure is expressly contingent upon the requisite congressional appropriations being made.

In the construction of the canals the Government is to utilize, so far as practicable, the easements reserved to the United States by the act of Congress of August 30, 1890 (26 Stat. 391), or by subsection P of section 4 of the act of Congress of December 5, 1924. Any other right of way needed is to be secured by the district.

Upon the completion of the construction program the Secretary is to render the district a statement showing the total expenditures and the amount thereof repayable by the district. If the construction of the project is so far completed that the delivery of water may be initiated to some part of the district territory, the Secretary may give notice to the district to that effect, fixing a tentative per acre construction charge for the land in such territory. The construction charge is payable in 39 installments.

THE BOARD OF CONTROL

In order that the project may be operated and maintained by the water users after the termination of the construction program, a board of control is constituted, made up of representatives from the directorates of the contracting irrigation districts.

The district is to levy assessments and use its taxing power in order to pay to the United States the amounts coming due under the contract. The district, as a whole, is obligated to pay to the United States the full amount agreed upon, regardless of individual default in the payment of any assessments levied by the district. Thus, what the water users designate as "joint liability" is provided for.

If the district is in default for more than one year in the making of any payment to the United States, the Government reserves the right to refuse to deliver water to the district or to the landowners of the district, and may take over the control of the irrigation system to make this refusal effective; or the Government may reduce the amount of water delivered to the district in proportion to the default of the district in making payment of charges.

After the United States turns over the operation and maintenance of the project to the water users the annual notices of the amount of the operation and maintenance charges is to be given by the board of control. The operation and maintenance charges are to be uniform to all of the new lands and to all of the old lands of the project.

Until the construction charges are paid the board of control is to employ a project manager satisfactory to the Secretary of the Interior, and if the manager employed by the board is or becomes unsatisfactory to the Secretary the manager is to be discharged, upon the request of the Secretary.

The district is to have access to the books and records of the Bureau of Reclamation, and the Bureau of Reclamation is likewise to have free access to the records of the district.

SPECULATION RESTRAINED

In the endeavor to restrain speculation in the land to be reclaimed, the contract provides for an appraisal of the land without regard to any enhancement of value on account of the prospect of a water right from the project. If sales are made at prices above this value, plus the appraised value of any improvements subsequently placed on the land and plus the amount paid toward the construction charge, such surplus is to be divided equally with the project. This is on the theory, believed to be correct, that the project expenditure caused the increase in value, and that the project is therefore entitled to share in the profit.

Sugar beets grown on the Milk River project, Montana

It is the policy of the reclamation laws to spread the benefits of the expenditures from the reclamation fund as widely as possible; and it would be contrary to this policy if a project were to be constructed for the benefit of a few large landowners. The reclamation laws, therefore, prohibit the furnishing of water to more than 160 acres per single ownership. All large landowners who care to do so are given the privilege of selecting the 160 acres which they desire to have irrigated from the project water right; the remainder of their land is excess land, and may receive water from the project only if the owner enters into a contract for the appraisal of the excess land and for its sale within a fixed period at prices and upon terms satisfactory to the Secretary. If a large landowner should refuse to enter into such a contract, he will not be entitled to water for more than 160 acres of his land.

It is a tenet of constitutional law that the States may not tax Federal property without the consent of Congress. In 1916 Congress enacted a law, known as the Smith Act, which permits irrigation districts organized under State laws to tax for irrigation purposes the land of the United States, including entered land upon which final certificate has not been issued. An article in the Owyhee contract makes this provision of law applicable to the lands within the Owyhee irrigation district. This enables the district to collect assessments from such land and to sell same at tax sale if the assessments are not paid.

The contract is to be confirmed in advance by the court. Every landowner is thus given a chance to object, if the proposed contract is illegal or unjust as to him. In this manner private rights are protected, and the United States and the district are given assurance if the contract is confirmed by the court that the carrying out of the agreement will not later be upset at the suit of a district taxpayer.—*Legal Division.*

LAND OWNERSHIP AND PLANS FOR SUBDIVISION AND SETTLEMENT

The Owyhee project includes about 70,000 acres (without deduction for rights of way) of irrigable new land not at present under irrigation, and about 41,000 acres of irrigable land now in small districts which derive their water supply from the Snake River by means of pumping. There are 13,000 acres under the Owyhee Ditch, a corporation which will receive a supplemental water supply from the works to be constructed by the United States.

The land in the pumping districts and under the Owyhee Ditch is in general settled by farmers and is intensively cultivated. Of the 70,000 acres, only 18,000 acres are puble land and about 5,000 acres State land. The Eastern Oregon Land Co. is the largest owner of patented land. The other owners of patented land eontrol areas of from 160 to 640 acres. Generally these lands have been in private ownership for a considerable number of years, and attempts from time to time have been made to cultivate them by dry-farming methods, but the low annual precipitation is not sufficient to make this method of agriculture profitable. On the Dead Ox Flat there still remain several settlers who are farming without the use of irrigation.

Cutting alfalfa on the North Platte project, Nebraska-Wyoming.

SOILS

The soils of the Owyhee project are generally deep and the surface is such as to make the land adaptable for irrigation. Practically all of the undeveloped land north of the Owyhee River is covered with a heavy growth of black sagebrush. This must be cleared and the surface smoothed in order that water will spread over it evenly. The climatic conditions of the Snake River Valley permit the growth of a wide variety of crops common to the Temperate Zone. Chief among these are alfalfa, Indian corn, the small grains, red clover, potatoes, and beans, and, in certain favored locations, apples and prunes. The project is located a considerable distance from large centers of population, and because of this the freight rates on bulky crops are high. These conditions make it necessary that a diversified agriculture be followed and that crops be concentrated by preserving or manufacturing into products of high values, such as butter, cheese, canned fruits, and vegetables, or that crops be fed to animals and the products sold as beef, mutton, and wool.

Farm units on the Boise project and on the privately developed pumping districts in the vicinity vary in size from 20 to 160 acres, but generally from 60 to 80 acres are considered to be a farm unit sufficient to support a family and to utilize the family labor throughout the year.

SPECULATION ELIMINATED

As a condition precedent to the expenditure of the appropriation for the construction of the Owyhee project, the land was to be appraised, so that settlers could buy it on its productive value. This appraisement has been made by a board comprising one appraiser designated by the Secretary of the Interior, one each by the two irrigation districts in Oregon and Idaho (to serve in his district only), and the other selected by the first two representatives mentioned. The deepest soil of even topography and considered to be the best on the project has been appraised at an unimproved value of $15 an acre. However, there are only 18,459 acres of this character of soil on the project. Lands of rougher topography or of soil not so favorable have been appraised considerably under the above figure. Lands deemed to be temporarily unproductive and of doubtful value were appraised at $2 an acre and nonirrigable land as low as $1 an acre. The average appraised value of the unimproved productive land is $10.20 an acre, and for all the land, which includes the nonirrigable, the value per acre is determined at $7.42 an acre.

Head lettuce is one of the money crops of the water user, one of whom sold $86 worth from about ⅛ of an acre

This appraisement is to be followed by the execution of contracts between the United States and the various landowners in which the landowners shall agree to sell their excess lands to qualified settlers at the appraised value. This will eliminate the speculative features of land settlement that in the past have proved to be so burdensome to the pioneer home builder.

AID TO AND DIRECTION OF SETTLERS

It has been recognized from the beginning that in order to settle this project rapidly and successfully settlers should be selected in accordance with their experience and capital and that some aid and direction should be furnished them after acquiring the land. The low rainfall makes it necessary that as much of the new farm as possible be put under irrigation the first year. To clear all of the land and level it for irrigation, plant it in profitable crops, and erect houses, barns, fences, and other necessary improvements will require the expenditure of capital that few new settlers will possess.

The selection of settlers in accordance with their experience and capital is already a part of reclamation law, and it is planned that when the water is available to irrigate the privately owned land this also be made a feature in disposing of other than public land. Progressive local citizens and officials of the Bureau of Reclamation have given a great deal of thought and attention to the organization of a local corporation that may prepare some of the land in advance of settlement and create a revolving fund for the purpose of making loans to complete the development and equipment of farms. To date such a corporation has not been organized, but its need is recognized, and attention must be given in the future to creating such an institution.

GOOD PROSPECTS FOR SUCCESS

If the land is scientifically subdivided, so that the area of farm units will vary to suit the needs of settlers' capital and labor in the family and boundary lines fit in with canals and drainage courses, and if this is followed by the preparation of some land before settlement and the creation of some long-time credit, there is little doubt of the successful and rapid development of the project. Without these essentials, settlement and farm development will be slow and there will be a delay in the return of the cost of constructing the project.—*Geo. C. Kreutzer.*

We are confronted by the need for more money in the development of farms, the exercise of more science and skill in their cultivation, and the organization of communities so that they can meet the social and economic problems more effectively than they have in the past.

INVENTORY OF DAIRY CATTLE ON RECLAMATION PROJECT FARMS AT CLOSE OF 1925

State	Project	Number	Value	
			Each	Total
Arizona	Salt River	18,052	$85.00	$1,534,420
Arizona-California	Yuma	1,554	71.76	111,521
California	Orland	1,218	75.00	241,890
Colorado	Grand Valley	3,389	36.93	51,297
Idaho	Uncompahgre	1,700	35.36	166,187
	Boise	4,607	42.23	405,725
	King Hill	644	50.00	32,190
Montana	Minidoka:			
	Gravity division	3,992	63.19	252,241
	Pumping division	2,610	51.48	134,365
	Huntley	1,968	37.00	72,830
	Milk River	914	56.22	51,390
	Sun River:			
	Fort Shaw division	849	46.51	39,489
	Greenfields division	1,006	38.18	38,415
Montana-North Dakota	Lower Yellowstone	1,947	50.20	97,847
Nebraska-Wyoming	North Platte:			
	Interstate division	5,284	45.00	237,780
	Fort Laramie division	1,752	45.00	78,840
	Northport division	131	45.00	5,895
Nevada	Newlands	8,184	85.00	695,651
New Mexico	Carlsbad	377	61.47	23,175
New Mexico-Texas	Rio Grande	6,373	81.79	521,274
Oregon	Umatilla	2,784	54.82	152,619
Oregon-California	Klamath:			
	Main division	3,234	60.00	190,040
	Tule Lake division	255	60.00	15,300
South Dakota	Belle Fourche	3,714	36.78	136,600
Utah	Strawberry Valley	3,000	55.00	165,000
Washington	Okanogan	307	52.07	16,091
	Yakima:			
	Sunnyside division	12,063	56.95	687,041
	Tieton division	2,752	62.76	172,705
Wyoming	Shoshone:			
	Garland division	1,720	43.82	75,378
	Frannie division	551	40.87	22,520
Total and average		104,931	62.18	6,524,586

Project Women and Their Influence in the Home and on Farm Life

Economists are unanimous in stressing the important place occupied by women in rural life, and the value of their work in making homes out of mere dwelling places and in building up the morale of a community

By Mae A. Schnurr, secretary to the commissioner and associate editor, New Reclamation Era

DO the women on the projects desire to retain "their section" in the NEW RECLAMATION ERA? Read a few of the answers made to this question.

"In my opinion it would be a serious mistake to discontinue this subject matter, as I am sure a large number of the entrymen use the NEW RECLAMATION ERA not only as a magazine but as a part of their permanent library. Only yesterday I was talking to a unit holder about a permanent pasture he had, and he stated that the seed was planted in the proportion and amount as outlined in some article of the RECLAMATION ERA some two years ago. This entryman was very much pleased with the results, and what is true pertaining to topics of interest to men surely is of vital interest to the women, and it would appear to me that matters of interest to the women should be continued if we are to keep up the NEW RECLAMATION ERA."

"The problems of the women and children on the projects are fully as important and as numerous as those of the men, and I am strongly of the opinion that the NEW RECLAMATION ERA should carry matter covering at least one or two pages each month of interest and helpfulness to the project women and their families.

"The RECLAMATION ERA is usually read by every member of the family who can read, and furnishes subjects for discussion around the table at home and at school, and I expect in most cases the farmer himself gets the greater part of his information regarding what is in the ERA from either his wife or his children, as during the busy season he does hot have time to read a great deal.

"I believe the material that is now being printed in the RECLAMATION ERA for women is of great benefit to the families on the project and to the project as a whole, and I think the pages should be continued.

"Since the profitable cultivation of the land and the establishment of an ideal farm home are the two main objects to be accomplished in reclamation, and as the women have a great deal to do with both, I can not see how the RECLAMATION ERA could fulfill its mission as completely as it should if it neglected the women."

"It is generally recognized now that the woman and her work is nearly as important on the farm as the man with his stock and crops. Why then should she be dropped from the columns of the NEW RECLAMATION ERA—unless the entire periodical be maintained only to publish the necessary project reports, etc.?"

"In my opinion a section devoted to the problems and activities of the women on the farms is just as important as the articles relating to pigs, cows, and crops. I believe further that it will be possible to secure some interesting articles from the project women and that the elimination of the women's section of the NEW RECLAMATION ERA would be received with considerable disappointment by the wives of the farmers on this project."

"It is my opinion that this section is very popular among the project women folks."

"There can be no question but that this section of the magazine is the only portion of the publication that holds the interest of the women folks on the projects, and if they are to derive any benefit along with the men from the publication it is necessary that this department be continued."

"It is my opinion that by all means this section should be retained, if possible. It is admitted that the women are a great factor in reclamation homes, and unquestionably any new ideas or an exchange of ideas which may have the effect of making farm home life more attractive and tolerable will add to the health, interest, and energy of the farmer, which will be reflected in his general prosperity, and in turn serve as insurance for the success of the Government's undertaking.

"It is not imagination that makes it possible to state, with little danger of contradiction, that the successful farms, on this project at least, are the ones where the feminine influence is strong. The farm home should be considered as being as vitally important as the farm ditch or barn, and to devote the ERA exclusively to these latter and similar features and to those who direct them would leave a void which would be a disappointment to the readers of this periodical.

"On our project we have many women who direct the destinies of both the farm and the home, and it is possible that anything that would tend to remove the means for making the home more attractive would react to the detriment of the whole establishment. If the women on the farms are satisfied, the morale of the farm families is usually high."

"It is my opinion that this section should be continued, as it is well known that the woman's part in the business of the farm is perhaps as important as that of the man."

"I believe that if the ERA is to be interesting to water users of the project the retention of this particular section is desirable, and it should be enlarged and edited to the extent of appealing to the project women. The ERA circulates in the field which is very difficult to satisfy. It is not a technical irrigation journal, but should contain from time to time articles written in popular vein on construction work of the service. It is not strictly an agricultural publication, but it should carry crop items and news of crop yields, movement, and values. It is not a 'Farm and Fireside' publication; but since it goes into the homes of all water users there is every reason to believe that a section should be devoted to the interest of project women. Just what form this should take I am not competent to give you any ideas of value, but I do think that the idea is an excellent one and that the home feature can be made one of the strong and appealing sections of the magazine."

"I want to congratulate you on the interesting articles you are writing for the ERA. They are excellent."

"The project women generally are favorable to the continuation of this section and would very deeply regret its discontinuance, as they find in it many things of interest to them."

Advice to the Home Builder

Progressive Construction of Farm Homes [1]

PROGRESSIVE construction is not new to the farmer, nor is the unit system of building less known to him than to builders elsewhere. Few successful farms, indeed, are completely equipped at the outset.

Modifications in the initial layout and additions to the original structures are often found desirable. Alterations to suit changing needs and supplementary buildings to meet new demands are in logical order. The farmer everywhere develops and improves his farm by successive stages; some with results more truly progressive than others.

As a builder he neither receives the recognition to which he is entitled nor enjoys anything like the helpful guidance and cooperation of kindred interests available to builders in other fields.

As a consequence, we have wasteful methods of construction, unwise and uneconomical selection and use of materials, lack of convenience, low efficiency, expensive upkeep, extravagant remodeling costs, unattractive surroundings, and poor living and housing conditions as compared with urban development.

The farm home is not merely a place of shelter. It has many functions to fulfill and it should be designed to meet these with economy, harmony, and greatest convenience.

The farm house is the center of all human life on the farm. Over one-third of our total population live in farm homes. Its design and equipment are of even greater importance than in the city house.

With an average of seven and one-half buildings on six and one-half billion farms, such buildings deserve careful and intelligent planning, and it is of equal importance to plan the relationship of these buildings on each individual farmstead.

Too many farm buildings are poorly planned to meet the particular requirements of the farm. A far greater number are entirely unplanned.

The value of a well-studied, predetermined plan can hardly be overestimated. To proceed without it invariably results in costly mistakes and everlasting dissatisfaction.

Before undertaking to build, all probable future housing requirements should be fully listed and given due consideration along with the present essentials.

Without carefully planning to permit of future expansion, or possible changes in duty, or alternate uses, buildings are rapidly outgrown, become inefficient or completely obsolete.

The problem of providing adequate housing yields not alone to dollars and cents but is as often solved by simple forethought. True enough, a budget must be adopted and followed, but the amount of ready capital available should certainly not govern the ultimate size or layout.

The fact that the farmer's capital is limited, either in establishing himself on a

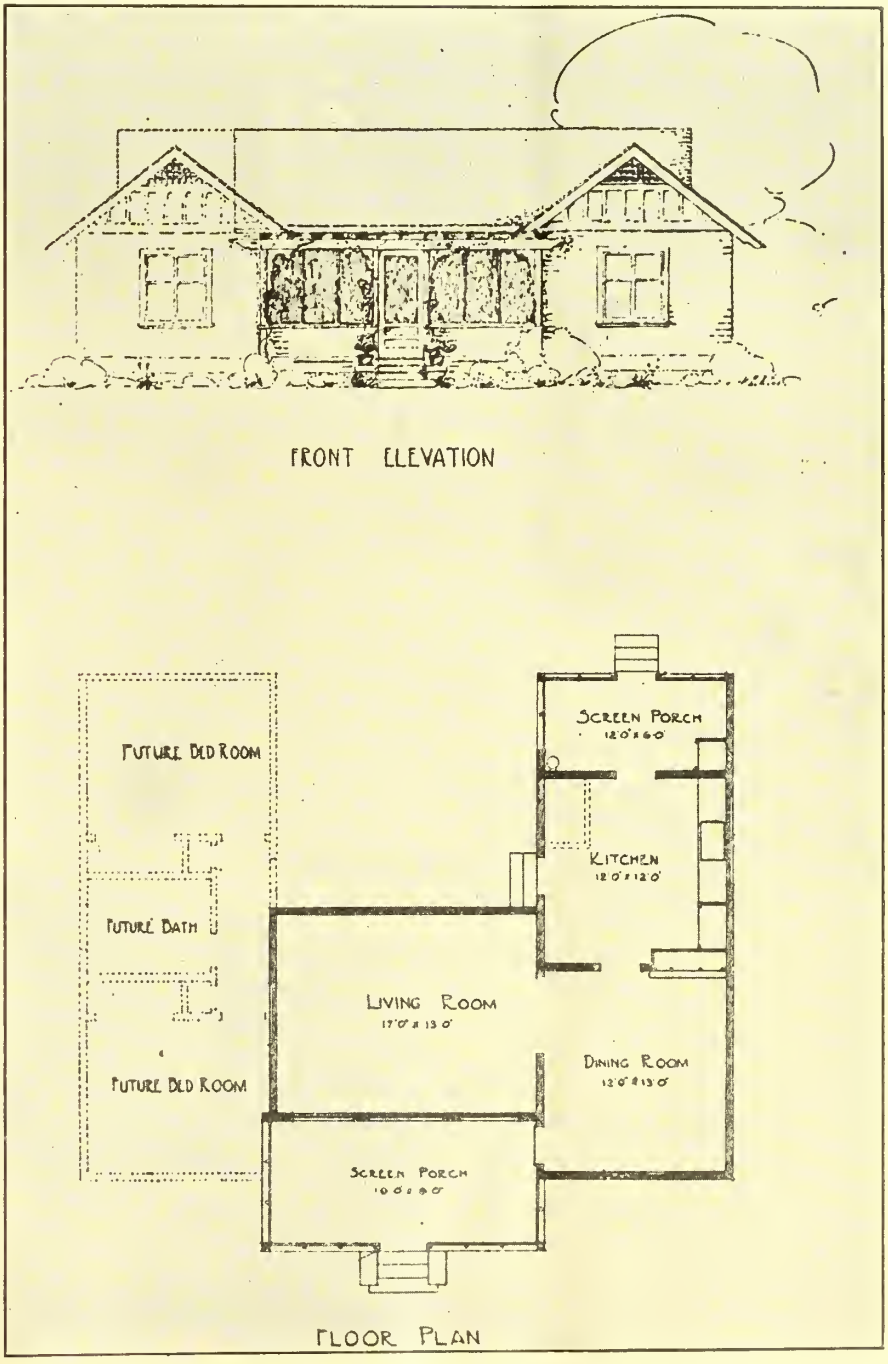


FIG. 1.—Illustrating the possibilities of unit construction. Portion indicated in solid black, or even a single wing, may serve satisfactorily at the outset with the extension indicated in dotted lines added later as funds permit

[1] By Max E. Cook, Mem. A. S. A. E., farmstead engineer, California Redwood Association (for six years in charge of the building work for the California State Land Settlement Board).

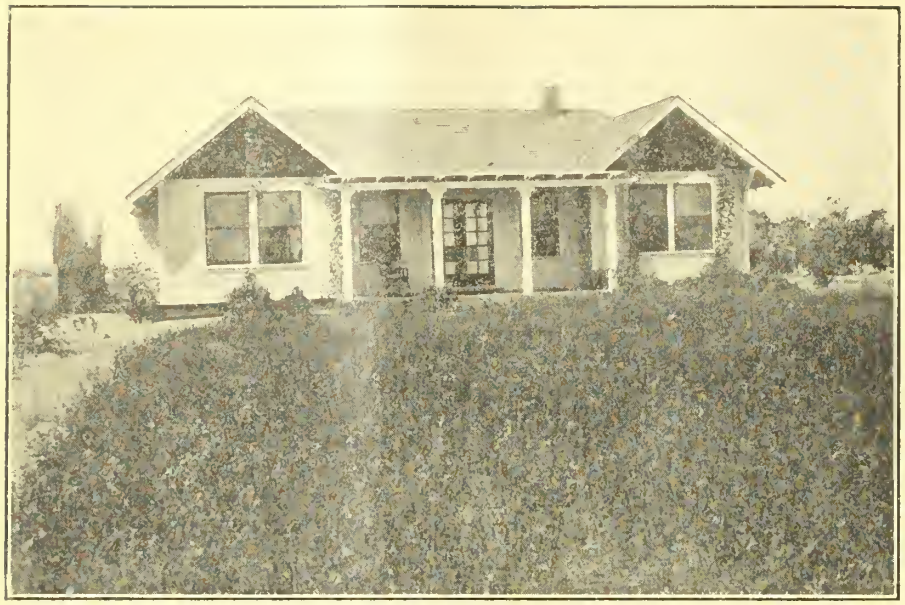


FIG. 2.—House built to a plan similar to Figure 1. The porch was added two years after the first construction work. It may yet be screened

new farm or in making improvements on an existing one, does not justify his proceeding without a comprehensive plan. It makes it all the more necessary to have one.

The poorly planned building or house of bargain materials, adopted because it appears to be the "most for the money," is a poor investment. Quality is too often sacrificed, while rooms and floor areas are held down to a bare minimum and arrangement is inflexible. In the later addition of a needed porch or an extra room or two that are sure to follow, the modest little house with the "Queen Anne" front soon acquires a "Mary Ann" back.

These contingencies are all successfully met by the adoption first of a systematic and orderly plan of procedure. There are three distinct and separate methods by which successful results are obtained progressively without sacrifice to quality or appearance where available funds are yet limited.

(*a*) *The unit system.*—The unit system of planning and building makes possible many variations in size and layout to meet individual requirements. The principles apply alike, in making new improvements on an established farm or in the development of new farms, either with buildings alone or in the farmstead layout itself. Buildings are designed and laid out as dictated by ultimate requirements, but in such form as to make it possible to build in units to meet only the preliminary needs. Provision is made to avoid waste in making later additions and by anticipating maximum salvage possibilities where actual changes are necessary.

The units as they are developed are complete in every sense, and at least that unit or portion of a building that is built is enjoyed to the limit, containing, as it does, all the features of convenience, equipment, and finish individually desired. (See figs. 1 and 2.)

(*b*) *Shell or skeleton system.*—Obviously, building on the unit plan is not satisfactory where there is a definite requirement for greater area or larger floor spaces. To obtain the maximum amount of permanent housing at the lowest possible cost, there is but one road open. It becomes necessary to carefully eliminate the nonessentials, omitting only those things that can be added later with the least inconvenience and without sacrifice to a good foundation, honest frame, solid construction, durable walls, and roof. In other words, build the shell or skeleton of a building, but let it be the nucleus of a better building—a permanent improvement. An advantage that this method has over the unit system is that there is less tendency to depart from the original plan than where the unit system is adopted. Furthermore, the exterior surroundings are undisturbed by later developments.

(*c*) *Dual-purpose structures.*—Where there are insufficient funds to permit of building, according to recognized standards, either a finished unit of a permanent structure or a good building honestly built that may yet be incomplete as to full equipment, finish, etc., it is sometimes found desirable to erect a building to be occupied temporarily for a given use with a plan for conversion later to meet a future requirement.

Such a building, carefully and thoughtfully designed, can be made to serve very satisfactorily as a temporary dwelling and as such can have many conveniences and be made very livable with considerably less invested than is possible by any other means. All special equipment, such as sash, doors, screens, hardware, trim, etc., are selected of design and type suitable for the more elaborate structure to follow. They are incorporated temporarily in such a way as to be readily removable

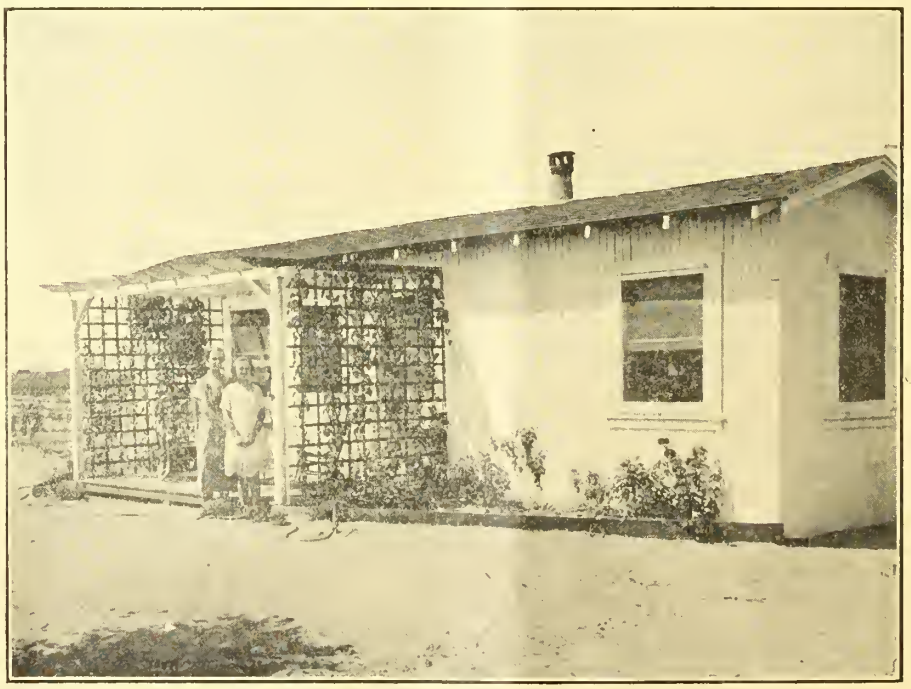


FIG. 3.—A 3-room temporary dwelling designed to be converted, at a future date and at minimum cost, into a poultry house

Women on the Projects and Their Relation to Better Agriculture

The reclamation projects offer unusual opportunities for organized effort on the part of the women in coordinating all those activities which tend to the building up of the highest type of rural life

and are thus recovered later without damage or unnecessary expense. (See fig. 3.)

Progressive building is merely another means of building on the installment plan. No one method can be considered best while the human element is involved. Obviously, one without real ambition and firmness of purpose should not be encouraged to build a temporary dwelling if there remains any doubt as to their ability to carry on to the development of a better home later. The same obtains, although perhaps to a lesser degree, with the other two methods outlined.

We are fully aware that while each farmer's building problem is an individual one, he yet can not afford direct professional services to assist him, nor can he be successful farmer, agricultural engineer, architect, and master builder alike.

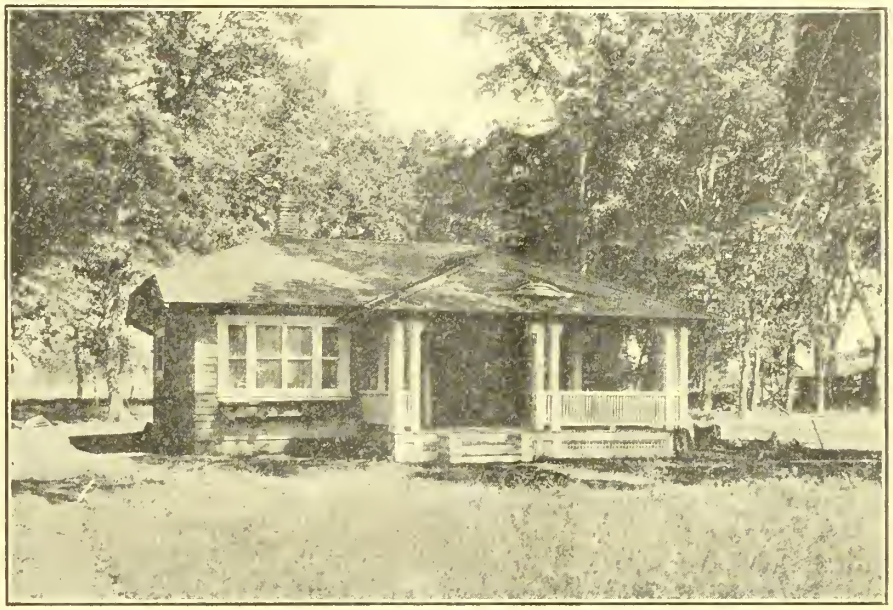
Forward strides were made at the recent National Farm Homes Conferenee at Chicago with a view to eombining forces in furnishing the farmer with suggestive plans and reliable guidance in his building development.

While 95 per cent of all farm buildings are constructed of lumber, there yet remain untouched possibilities in planning farm structures that permit of the utilization of economical lengths and stock sizes of speeies and grades most suitable.

Hand in hand with any educational effort that is undertaken to promote better farm buildings should go a decidedly closer working relationship with the retail lumber dealer. To keep apace with modern merchandising methods, he is fast converting his former "lumber yard" into a eomplete building material supply house; in many instances supplemented with a free-plan service. His importance in most farming communities as a "father adviser" on all building matters is too often ignored or overlooked. He merits recognition as one of our strongest allies in the better farm building movement.

Something to Think About

It is generally known that our farm women are progressive. On some of our projeets we have the finest women's organizations that are alive to every opportunity for bettering the conditions on the farm and in the farm home.



Well-planned shade trees add to the attractiveness and value of the property

I have heard of many women planning their vegetable gardens in such a way that it took into account the marketing of a considerable surplus, after the needs of the family are taken eare of, and a generous supply stored away for the winter. In many cases she has a particular market in mind, but in more cases it is a hit-and-miss proposition.

One woman writes she found a market for squashes at a hotel in a near-by town; another that the demand for strawberries from her patch had so increased that she is planning to plant another time as many next season; her market for these, however, is not prearranged.

Think of the stimulant to better results if arrangements could be made in advanec for the surplus output of each vegetable garden! Why shouldn't this be done?

Organized Effort

"In union there is strength" is just as forcible a slogan in cooperative marketing of vegetable-garden crops on a small scale as the greater operations of whole farming eommunities. Indeed, these latter were often attained by small beginnings.

Towns nearest the projects are visited many times in a year by project women, and club and community work oftentimes draw the farm woman and town woman together. Why shouldn't this contact be capitalized to the benefit of both the farm woman (the producer) and the city woman (the consumer). Think of the middleman's profit the latter is paying day in and day out. Why not eliminate this? It can be done and should be done on a cooperative basis.

Get together on the projects and talk this over, elect your representatives to meet with the city women, and see if the latter can not arrange for the marketing of the produce sent to town.

The city woman will reap the harvest on every purchase she makes. Besides, there is no better community work than that which even suggests the helpful hand.

Shade Trees

There is a dearth of trees on many of our projects. There is no one thing you can add to the grounds surrounding your home that will give you so much pleasure. They add to the attractiveness, increase the value of the property, furnish the much-needed shade from the withering rays of the sun in summer, reduce maintenance costs on the home by protection from the elements, foster bird life, which in turn destroy many insects, and purify the air, holding in their foliage the dust that would otherwise settle on the house.

The above photograph shows the effect of well-planned shade trees.

Sheep Feeding on Grand Valley and Uncompahgre Projects, Colorado

By J. C. Page, Superintendent, Grand Valley Project, and L. J. Foster, Superintendent, Uncompahgre Project

A SMALL amount of individual lamb feeding has been practiced intermittently on the project farms for several years. A few individuals would take bands of 500 to 1,000 lambs from summer range, feed for periods of 45 to 100 days, and then ship to market, receiving current prices. In a few instances the element of speculation in the purchase and sale has proven disastrous and heavy loss incurred. This caused discouragement and prevented the rapid development of an industry which progressive farmers recognize as a necessary adjunct of succesful farming, required both as a means of utilizing unsalable forage and increasing the fertility of the farms.

During the month of October, 1925, a banker of the town of Delta on the Uncompahgre project and a successful farmer on the same project with capital secured from Kansas City connections purchased 32,000 head of lambs from points in Utah and Idaho; 7,000 of these lambs were purchased at $11 per hundredweight, 14,000 at $12.10, and 11,000 at $12.25. These lambs were shipped to western Colorado in carload lots of 300 lambs per car. The distribution of the lambs was as follows: 2,600 on the Grand Valley project, 28,000 on the Uncompahgre project, and 1,400 to other points along the Colorado River. Eight thousand of the lambs were fed on properties owned by the promoters and 24,000 were distributed among farmers here and there under contract.

THE POUND-GAIN CONTRACT

Each individual farmer who entered into contract for the feed and care of the lambs did so under what might be termed a pound-gain contract. They accepted the weights of the carload shipment at whatever point shipment was made and received payment at the rate of 10 cents per pound gained. They received the lambs at the nearest railroad point and trailed them to the feed lots. The lambs purchased usually ranged from 60 to 65 pounds at the Utah or Idaho shipping point, and when shipped to eastern feeders the average gain amounted to about 15 pounds per head. The contract feeders, of whom there were about 30, had no investment other than that required for the material and labor for feed lots, which averaged about 10 cents per head, but of course care was exercised to see that the contract feeders had suitable forage and water facilities.

All feeding under contract was done under direct supervision of the owners. The first one-half of 1 per cent loss by death was borne by the owner, the next one-half of 1 per cent by the contract feeder, and any additional loss was shared equally by both parties. There was little loss during the 1925 and 1926 feeding season, and all contract feeders made good money with the exception of one, and his loss was due to improper care and handling.

BASIS OF LAMB DISTRIBUTION

The basis of lamb distribution to the contract feeder was in the ratio of one lamb to consume the tops of each ton of beets raised. The feeding period ranged from 60 to 80 days. The lambs were received during October, and the endeavor was to get the necessary increase in weight in time for shipment on the January market.

The best results were obtained by feeding in small inclosures and driving the flock over beet-top pasture or other pasture once or twice a day. Care had to be exercised to obtain the proper ration in order to prevent scouring. The common ration was alfalfa with beet tops. Mangel range was utilized in a few cases. Stubble range was also utilized. No grain feed was required, as no attempt was made to finish the lambs for market.

On account of location, practically all lambs fed in western Colorado are contracted to feeders in the Middle West, for the reason that it is not advisable to prepare lambs for the packers in a locality where from 24 to 48 hours' travel is required to reach the market point. Such long travel causes excessive shrinkage and the market fluctuations can not be anticipated.

RESULTS WERE GOOD

As stated before, the average gain amounted to about 15 pounds per head, which under the terms of the contract resulted in a payment of $1.50 per head to the feeder for each lamb fed. On the basis of the feed and roughage consumed it is estimated that the feeder received 50 cents per ton for his beet tops and $10 per ton for his alfalfa. The Uncompahgre project feeder did very well with his 1925 alfalfa when consideration is given to the fact that hay was a drug on the market with practically no buyer at any price. Consideration is also given by the progressive farmer to the value of the fertilizer obtained, each carload of 300 lambs producing from 35 to 40 loads of fertilizer.

It is also estimated that in order to carry on operations better than $300,000 outside capital was diverted to western Colorado during the past feeding season.

The contract feeders are desirous of carrying on similar arrangements during future years, and plans are now being considered for the 1926–27 season. It should not be so difficult to secure additional feeders for future years. The plan in force permitted responsible men with little capital or no capital at all to handle a carload or two of lambs, being limited only by their feeding facilities. An outlet was provided for forage usually without a market; idle time was put to a remunerative use, and probably the best result of all came from the building up of impoverished soil. The success of last year's plan will, it is hoped, enlist the aid of local capital in the further growth of a necessary industry on both projects.

The Water Supply on the Projects

Crop damage from shortage of water is certain on the Okanogan project in Washington. Minor crop damage can be averted only by unusual summer rains on the Yakima project in Washington, the Boise and Minidoka projects of Idaho, and the Milk River and Sun River projects of Montana by reason of depletion of storage on which these projects are largely dependent in late summer. On the Yakima project much water has been lost through illegal diversion of project waters by other interests. A threatened severe shortage on the Truckee division of the Newlands project has been reduced materially by initial steps in administration of Truckee River water in accordance with a pending adjudication decree Unusual rains in early summer, combined with newly completed pumping installations, have removed all danger of shortage on the Salt River project in Arizona.

The settler under the irrigation canal needs special knowledge of soils and crops with respect to their relationship to water, in addition to their general behavior for agricultural purposes.

Organization Activities and Project Visitors

DR. ELWOOD MEAD, Commissioner of Reclamation, who left for Haiti on August 10 to investigate one of the irrigation possibilities there, returned to his office on August 30.

Homer J. Gault has been designated construction engineer on the construction of the proposed Gibson Dam on the Sun River project, Montana, advertisement for which was opened at Fairfield on August 31. Mr. Gault's post-office address is Augusta, Mont.

Associate Engineer A. C. Jaquith, of the Denver office, who has designed several large dams for the bureau, resigned, effective July 28, to accept a similar position in Mexico.

Engineer Julian Hinds, for the last 10 years in charge of the designing force of the Denver office, has submitted his resignation.

Chief Engineer R. F. Walter was on the Klamath project on July 1. From there he visited the following projects: Columbia Basin, Umatilla and McKay Dam, Yakima and Kittitas division, Lower Yellowstone, Milk River, and Sun River, returning to Denver on the 23d.

H. R. Roberts, of the Irrigation Department of the Union of South Africa, and D. G. Collett, chairman of the Irrigation Board of Graaf Reinet, South Africa, were recent visitors at the Washington office. They are visiting the United States with the desire of seeing as much as possible of our irrigation projects, for application of suitable information and ideas in South Africa.

George C. Kreutzer, Director of Reclamation Economics, was in the field from July 1 to 26, and visited the Riverton, Huntley, Lower Yellowstone, and Belle Fourche projects. He was in Denver from the 27th to the end of the month.

Andrew Weiss, Assistant Director of Reclamation Economics, who has been in the Washington office for some weeks, left for the field on August 11.

Sr. Marcelo Leon, special commissioner of the Secretary of Agricultura of the Mexican Republic, was in the Denver office recently for the purpose of acquainting himself with the methods of construction and operation of the irrigation projects. He is planning to visit several of the projects before his return.

District Counsel Coffey visited the Orland project twice recently in connection with legal matters relating to the closing out of Stony Gorge Reservoir land purchases.

R. T. Keenan, of the Pacific Bridge Co. of Seattle; Walter Ward, of the Ward Engineering Co. of San Francisco; and Fred K. Gettins, engineer for the National Surety Co. of San Francisco, visited the Stony Gorge Dam site during July in connection with the contemplated construction of the dam.

W. W. Putnam, agricultural statistician of the United States Department of Agriculture for Colorado, visited the Uncompahgre project to obtain information relative to crops grown during the 1926 season on the project.

Victor A. Galli, of the Argentine Republic, was a recent visitor on the Boise and Yakima projects.

S. B. Shannon and N. Shand, of the irrigation department of the South African Government, visited the Boise, Minidoka, American Falls, Yakima, and Riverton projects during the month.

Frank Scott, chief field man for the Utah-Idaho Sugar Co., was a recent visitor on the Milk River project.

T. O. Larson, of Choteau; J. M. Burlingame, of Great Falls; and William Huntsberger, of Great Falls, Mont., who were designated a board of appraisers in connection with the purchase of private lands within the area to be flooded by the construction of Gibson Dam, on the Sun River project, inspected the three tracts of land on August 5 with a view to making a report on their fair purchase value.

J. M. Hughes, land commissioner, and W. P. Stapleton, agricultural development agent of the Northern Pacific Railway Co., were recent visitors on the Lower Yellowstone project in connection with the plans for obtaining settlers for idle land.

State Engineer R. A. Allen visited the project office on the Newlands project in connection with a proposed domestic water supply for the town of Wadsworth from the Truckee Canal.

Assistant Engineer J. R. Yates and Superintendent L. E. Foster, Carlsbad project, made a trip recently through the upper reaches of the Gallinas watershed on matters relating to the Pecos River adjudication.

Prof. G. R. Hyslop, of Corvallis, Oreg., was on the Klamath project for several days gathering data with County Agent Henderson to make a report on the advisability of leasing Tule Lake lands for a period of more than one year.

Assistant Engineer R. R. Robinson, formerly on the Salt Lake Basin secondary project, has been transferred to the Kittitas division of the Yakima project.

Designing Engineer J. L. Savage was on the Kittitas division of the Yakima project for several days, principally in connection with the problems affecting the construction of the next 10 miles of the main canal.

L. C. Hill, former supervising engineer of the bureau, stopped at the El Paso office of the Rio Grande project on his return from a trip into Mexico.

Col. B. F. Fly, guardian of the Yuma project, and particularly of the Yuma Mesa, is again in Washington, D. C., and a welcome visitor at the Washington office. He is here in connection with the recent damage from the flood on the project and to discuss appropriation matters.

The personnel of the board of engineers who will review all hydrographic and geologic data pertaining to the feasibility of the proposed new dam site between Avalon and McMillan Reservoirs on the Carlsbad project is as follows: Louis C. Hill, former supervising engineer of the Bureau of Reclamation, who will represent the interests of the water users at Carlsbad and Fort Sumner; S. O. Harper, assistant chief engineer of the bureau, who will represent the bureau; and Oro McDermith, a former engineer of the bureau, who will represent the Secretary of the Interior.

Five Reasons for Crop Rotation

R. C. Stockdale, writing in a recent issue of the Rio Grande Farmer, gives the following five reasons for crop rotation:

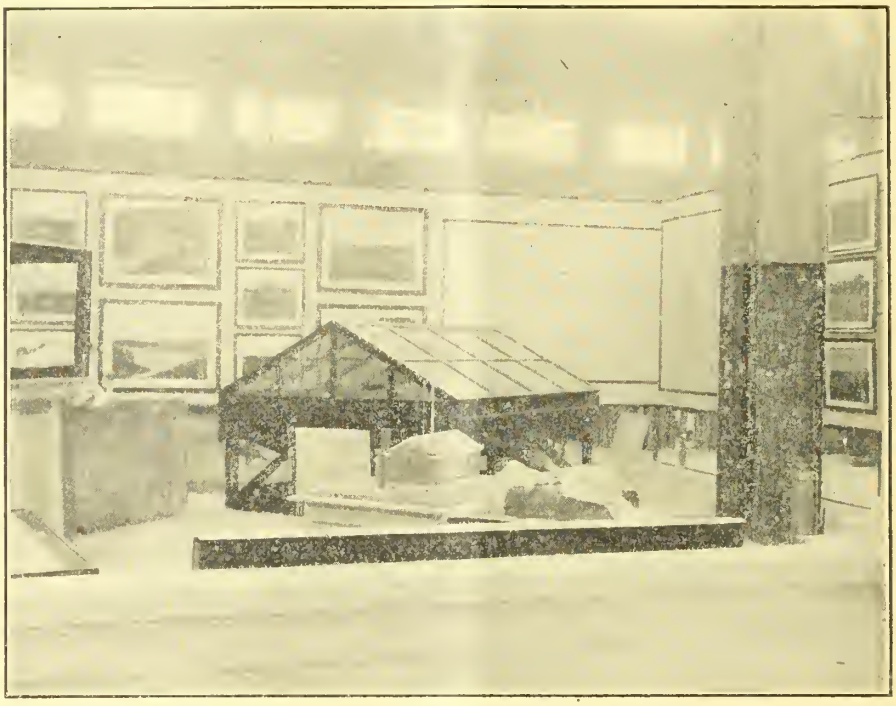
1. Rotation of crops is practically 75 per cent as effective as the use of fertilizer in effecting increases in crop yields, being nearly 90 per cent as effective as the use of fertilizer when the results on wheat, corn, and oats only are considered.

2. As based on the average yields at the beginning of the experiments involving fully comparable yields, rotation has been shown to be 91.5 per cent as effective as the use of fertilizer in maintaining the producing power of the soil.

3. In increasing soil productivity the effects of rotation alone may equal or exceed the effects of the use of fertilizer without rotation.

4. The effects of rotation and the use of fertilizer apparently are not the same, as is shown by the fact that their conjoint effects on crop yields are additive, being more than fully additive in most of the cases considered.

5. In permanent crop production, high productivity levels are possible only when rotation and the use of fertilizer are conjoined.



The model of a 40-acre irrigated farm and colored enlarged photographs, forming part of the bureau's exhibit at the Sesquicentennial Exposition in Philadelphia

The art of irrigation dates back to the beginning of written history. A great succession of civilizations, notable and extensive, have flourished on irrigated soils.

The use of water on irrigated lands was not based in ancient days upon scientific principles, but rested merely upon regulations, some of which were wholly contrary to the best modern knowledge.

FEDERAL IRRIGATION PROJECTS: COMPARATIVE COLLECTIONS

State	Project	Construction				Operation and maintenance			
		June, 1925	June, 1926	Total for year, 1925	Total for year, 1926	June, 1925	June, 1926	Total for year, 1925	Total for year, 1926
Arizona	Salt River			$599,326	$643,862				
Arizona-California	Yuma	$2,673	$4,629	354,345	345,957	$4,867	$7,798	$308,514	$232,522
California	Orland	1,536	1,140	36,758	82,794	332	484	26,693	35,617
Colorado	Grand Valley	(1)	(1)	(1)	(1)	3,213	5,994	49,953	60,353
	Uncompahgre	490	1,028	25,612	121,155	704	1,019	76,231	137,544
Idaho	King Hill					4,232		4,303	161
	Minidoka:								
	Gravity	742	2,026	62,328	152,663			12,639	31,407
	Southside pumping	699	21	31,206	71,089	572	8	36,998	53,893
	Jackson Lake		931	31,970	40,993	1,104	164	15,963	16,120
Idaho-Oregon	Boise	1,122		225,872	118,601	24,817	1,031	128,799	134,520
Montana	Huntley	211	1,450	19,175	29,239	869	1,451	32,334	36,255
	Milk River	(1)	(1)	(1)	(1)	3,975	1,810	19,249	19,685
	Sun River:								
	Fort Shaw	539	1,986	8,092	9,550	793	1,580	8,144	9,069
	Greenfields	(1)	(1)	(1)	(1)	1,411	2,005	15,235	17,661
Montana-North Dakota	Lower Yellowstone		4,891	3,350	18,859		8,817	5,221	28,868
Nebraska-Wyoming	North Platte:								
	Interstate	101	1,793	25,250	33,670	148	159	44,483	46,663
	Fort Laramie	(1)	(1)	(1)	(1)	10,444	421	68,136	36,574
	Storage		1,900	31,989	22,690			12,633	4,558
	Northport							22,748	23,381
Nevada	Newlands	47	1,005	39,926	55,277	1,774	1,748	101,467	122,146
New Mexico	Carlsbad		819	67,097	48,141		499	64,476	37,565
New Mexico-Texas	Rio Grande	10,635	30,377	210,236	250,021		100,000	211,091	246,701
North Dakota	Williston					5,298		11,004	
Oregon	Umatilla			5,730	417	9,879		27,458	8,002
Oregon-California	Klamath	5,087	19,200	66,407	54,971	264	22,291	58,692	62,506
South Dakota	Belle Fourche						4,023		43,717
Utah	Strawberry Valley	6,698	2,319	77,091	105,851	189	3,145	25,263	34,614
Washington	Okanogan		3,505	1,068	8,739		9,229	3,998	41,185
	Yakima:								
	Sunnyside	1,930	18,565	59,249	180,489	12,118	10,249	97,493	169,894
	Tieton	5,809	1,996	149,850	175,994	3,063	1,297	91,292	84,467
	Storage	5,350		63,265	88,305		430	20,577	18,316
Wyoming	Shoshone:								
	Garland	91	502	9,961	30,404	2,573	229	19,010	37,029
	Frannie	(1)	(1)	(1)	(1)	1,018	1,069	8,512	8,050
Total		43,740	100,083	2,205,153	2,689,731	93,657	186,950	1,628,609	1,839,043

[1] Projects on water-rental basis.

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 — P. W. Dent, Assistant to the Commissioner — C. A. Bissell, Chief of Engineering Division

W. F. Kubach, Chief Accountant — H. A. Brown, Chief of Division of Settlement and Economic Operations — C. N. McCulloch, Chief Clerk

George C. Kreutzer, Director of Reclamation Economics; Andrew Weiss, Assistant Director of Reclamation Economics

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	J. B. Bond				
Carlsbad	Carlsbad, N. Mex	L. E. Foster	W. C. Berger	W. C. Berger	Ottamar Hamele	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	A. R. McGinness	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.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	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	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg	H. M. Schilling	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.
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

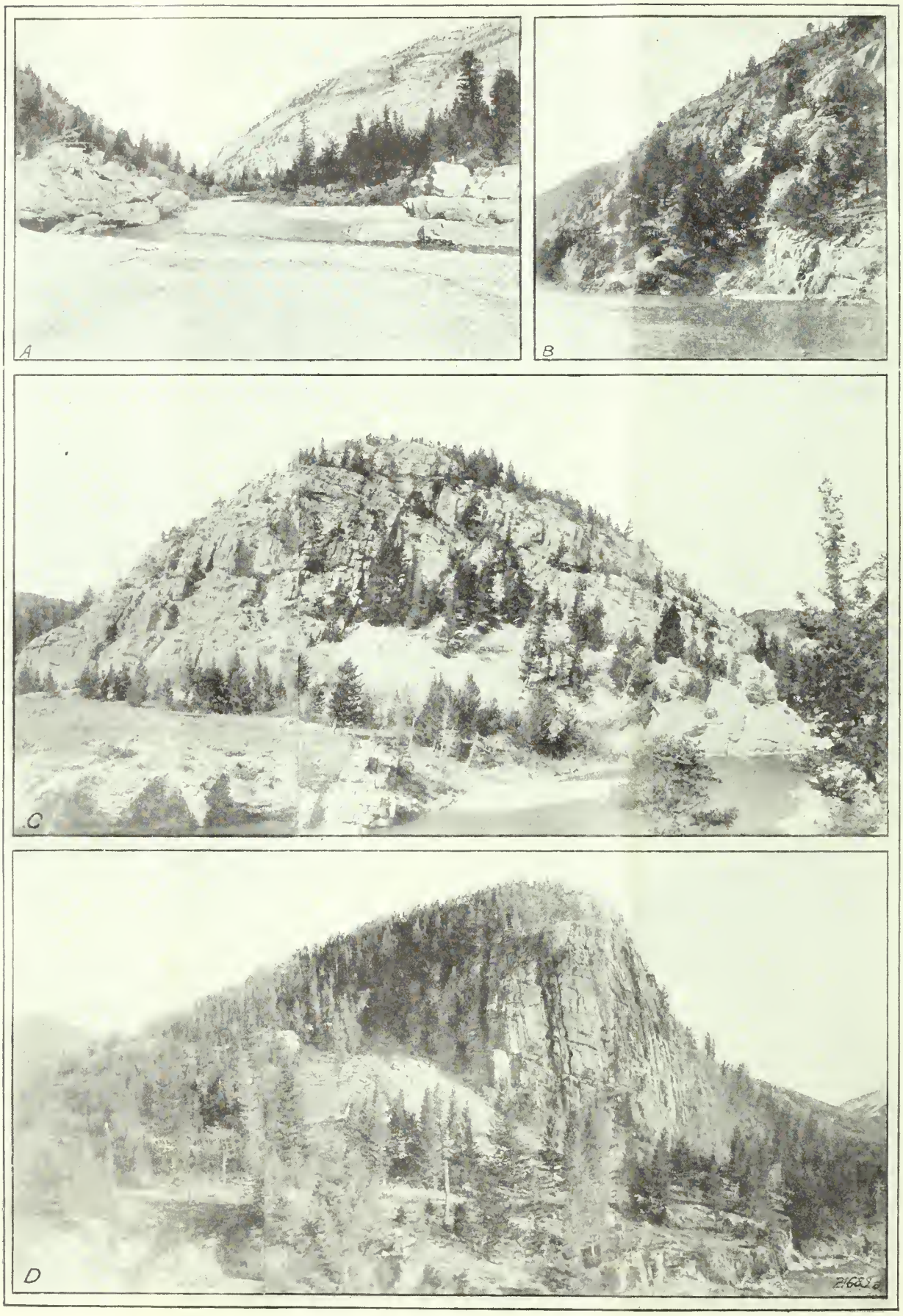
Minidoka, American Falls Dam.	American Falls, Idaho	F. A. Banks [5]	H. N. Bickel	O. L. Adamson	B. E. Stoutemyer	Portland, Oreg.
North Platte, Guernsey Dam.	Guernsey, Wyo	F. F. Smith [5]	Chas. Klingman	L. J. Windle	Wm. J. Burke	Mitchell, Nebr.
Umatilla, McKay Dam	McKay Dam, Oreg	R. M. Conner [6]	C. B. Funk	W. S. Gillogly	B. E. Stoutemyer	Portland, Oreg.
Kittitas	Ellensburg, Wash	Walker R. Young [6]	E. R. Mills		do	Do.
Sun River, Gibson Dam	Augusta, Mont	H. J. Gault [6]			E. E. Roddis	Billings, Mont.

[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
Sacramento Valley	Ellensburg, Wash	Walker R. Young	Sacramento Valley Development Association and State of California.
Spanish Springs storage	Fernley, Nev	A. W. Walker	
Owyhee	Boise, Idaho	R. J. Newell	
Vale	do	do	
Middle Rio Grande	Denver, Colo	I. E. Houk	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	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	Washington, D. C	Geo. C. Kreutzer	

The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others 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.



GIBSON DAM SITE, SUN RIVER PROJECT, MONTANA

A. River Channel, Looking Downstream from Gravel Bar about 250 Feet above Dam. B. Portal Spillway Tunnel, Looking Upstream. C. North Abutment. D. South Abutment

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NEW RECLAMATION ERA

VOL. 17 OCTOBER, 1926 NO. 10

APPLE PICKING TIME ON THE GRAND VALLEY PROJECT, COLORADO

THE NEW VISION

ECONOMIC studies have disclosed the obstacles which confront settlement and farm development, and they have also shown the position which settlement and farm development should hold in any successful scheme of reclamation. Visitors to settlers' homes on new irrigation projects can not fail to realize the economic waste which results from leaving them to struggle without aid and direction to complete the unproductive work of clearing the land and preparing it for irrigation. The more carefully this is studied the stronger is the conviction that much delay in repayment of construction costs, the trials and disappointments of settlers, can be averted by planning settlement and farm development as we have planned the building of irrigation works.

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. 17 OCTOBER, 1926 No. 10

Interesting High Lights on the Reclamation Projects

THE low stage of Lake Walcott, Minidoka project, in September was taken advantage of to make needed minor repairs to radial gates and head gates at the Minidoka Dam.

SHIPMENTS of agricultural products from the Minidoka project during August comprised 333 cars, 89 of which were of potatoes and 152 wheat.

THIRTY cars of certified seed potatoes have been contracted from Milk River project farmers by the State of Louisiana through the extension department of the State university. Representatives of the State who visited the project recently stated that Montana potatoes are very popular in Louisiana and that it is impossible at the present time to supply the demand.

THE Sun River project is enjoying one of the most prosperous years in its history. The alfalfa crop was better than usual and grain crops were particularly good. Prices are good and expected to go higher.

WORK has begun on the Lower Yellowstone and Belle Fourche projects on signing up land under the uniform option contract.

THE sugar-beet acreage on the North Platte project is the highest in its history, and indications point to an excellent yield, although probably not up to that of 1925, the banner year.

THE people interested in the Fallon sugar factory on the Newlands project have started a campaign of education to interest farmers in planting beets for the 1927 season. Contracts are now being signed for next year's acreage.

SHIPMENTS of agricultural products from the Yuma project during August totaled 92 cars valued at $193,050, bringing the total from the first of the year to 1,990 cars valued at $1,773,900.

ABOUT 900 cars of peaches of excellent quality were shipped from the Palisade section of the Grand Valley project.

TOTAL collections from the Strawberry Valley project during August amounted to $5,174.48, of which $309.82 comprised construction charges, $1,317.42 operation and maintenance, and $3,547.24 power and miscellaneous collections.

THE limited supply of water available on the Yakima project necessitated the closest possible regulation, but very satisfactory service has been possible and there will probably be no crop losses unless possibly in the case of extremely late plantings of potatoes.

APPROXIMATELY 152,000 acres of land in the Yakima-Benton and Kennewick irrigation districts have been mapped under the soil survey. About 15,000 acres remained to be mapped at the end of August.

ECONOMIC development on the Yakima project is shown by the following: The Naches Heights Community Club has dedicated a new community club house; Benton County is constructing a new courthouse at Prosser to cost $75,000; Sunnyside is preparing to construct a $30,000 sewer system.

GOOD progress is being made on the construction of the first 4 miles of the main canal on the Kittitas division of the Yakima project.

AT McKay Dam, Umatilla project, all concreting on the face of the dam has been completed, and the spillway gates and lifting devices have been installed.

ABOUT 9 p. m., August 22, Robert Herman, age 16, fell into the main canal on the Klamath project just above the intake of the tunnel. He was swept into the tunnel, which has a length of 3,300 feet. Some 15 or 20 minutes later he emerged from the lower end and was rescued, not much the worse from the experience.

THE Powell Creamery, Shoshone project, purchased 13,100 pounds of butterfat during August and manufactured 15,000 pounds of butter and 800 gallons of ice cream. Other agencies purchased 3,000 pounds of butterfat, the price of which at the close of the month was 35 cents a pound in sour cream and 50 cents in sweet cream.

SHIPMENTS of cantaloupes from the Rio Grande project comprised approximately 1,000 cars, the average price being 75 cents a crate, making a return of $200 an acre.

ABOUT 20,000 cubic yards of concrete were placed at American Falls dam during August, and at the end of the month it was estimated that only about 4,000 to 5,000 cubic yards remained to be poured in the dam. All excavations for the dam have been completed.

ON the night of August 30 the cold-storage plant of the Yakima Fruit Growers Association at Zillah, with a capacity of 750 cars, was destroyed by fire, probably caused by defective wiring.

10271—26——1

The Vale Irrigation Project in Oregon

The third of a series of articles describing and analyzing the plans and conditions under which the Department of the Interior is to develop the new projects for which money was appropriated by the Sixty-ninth Congress

THE proposed Vale project contemplates the irrigation of 28,350 acres of bench and valley land lying mainly along the north side of the Malheur River in eastern Oregon, centering around the towns of Harper and Vale, above the present Warmsprings project. No unusual construction features will be required in connection with the Vale project.

THE IRRIGATION PLAN

The irrigation plan for this project is closely related to that of the Warmsprings irrigation district, which has constructed a reservoir on the Malheur River about 60 miles west of Vale with a surplus capacity over that required for the district lands. One-half of the present capacity of 170,000 acre-feet is to be purchased for the Vale project at a cost of $8 per acre-foot. The installation of gates on the crest of the dam, which was provided for in the original plan, will permit the maximum water surface of the reservoir to be raised 4 feet and provide an additional 20,000 acre-feet of storage. This additional cost and capacity will be apportioned equally to each fistrict.

THE DIVERSION WEIR

Water released from the reservoir will flow in the channel of the Malheur River to a point about 1 mile west of Namorf. At this point a simple diversion weir, 12 feet high and 150 feet long, resting on rock, will be constructed. This weir will require 4,000 cubic yards of excavation and 300 cubic yards of concrete. The canal head gates will be set at right angles to the crest of the weir at the left or north abutment.

THE MAIN CANAL

From this point to the upper end of Harper Valley, a distance of about 6 miles, the main canal will have a capacity of 646 second-feet and construction will be difficult owing to the presence of rock, steep cross slopes, and conflict with the Ontario-Burns branch of the O. S. L. Railroad, which crosses the Malheur River immediately below the proposed point of diversion. The canal will be carried under the railroad by means of a concrete culvert. For approximately 1 mile the canal will follow the north side of the river and will then be carried to the south side by means of a flume 800 feet long, of which 100 feet would be on a steel bridge. For the next 4 miles the canal parallels the river on the south side to a point which is favorable for a siphon location, and where conflict with the railroad does not occur. At this point the canal is to be returned to the north side by means of a concrete siphon 1,015 feet long. Owing to the difficult territory traversed by the canal a large amount of steel and concrete bench flume will be required. In this 6-mile canyon section immediately below the point of diversion the aggregate length of steel and concrete flumes and siphons will be 14,000 feet.

THE HARPER TRACT

After leaving the canyon the canal supplies water for the Harper tract. This is an area of 3,735 acres of bench and bottom land north of the Malheur River contiguous to the town of Harper. Across the river from the lower end of the Harper tract is an area of 675 acres known as Little Valley. Water for this area is to be carried across the river by means of a second siphon. This is the only area south of the Malheur River for which works will be constructed.

Separating the Harper tract from the Vale Valley is a canyon about 6 miles in length. The conditions here are very similar to those encountered in the first 6 miles below the point of the diversion. Between the Harper and Vale Valleys the aggregate length of flumes and siphons will be 13,000 feet, in addition to which there is required 572 feet of concrete-lined tunnel 11 feet in diameter. Vale Valley is reached at the end of this canyon, and the main canal thereafter has but one structure of importance, namely, a 70-inch reinforced concrete siphon 6,200 feet long across Bully Creek.

DRAINAGE

Drainage is expected to be required on only a small part of the total area, principally in the Willow and Bully Creek bottoms.

The surplus storage capacity of the district to be used by the Vale project results from early overestimates of the irrigable area in the Warmsprings district. Seepage encroachments and refractory alkaline soils have reduced the amount of tillable lands in this district until at the present time about one-third of the original area of 37,000 acres classed as irrigable is capable of producing crops. This reduction in area has reduced the resources of the district to such an extent that it is incapable of financing a drainage program. By the terms of the pending contract for purchase of the surplus Warmsprings Reservoir capacity, the United States will divert from $150,000 to $200,000 of such purchase money to provide drainage for the district lands, and without further consideration the Warmsprings district drains will also carry off drainage waters from the higher-lying Vale project lands.

THE PROJECT COST

The total cost of the project is estimated at $3,590,000. Of this amount about two-thirds is required for the diversion weir and the main canal and approximately one-fifth for storage. The remainder of the estimated cost is required for laterals and drainage.

By means of a supplemental contract with the Warmsprings irrigation district it has been arranged that this district shall utilize the drainage and return flow from the Vale project lands to the greatest extent possible with the Vale project, receiving Warmsprings Reservoir storage in equal amount in exchange.

The total area commanded by the canals of the Vale project, not including lands now having a full water supply, is 36,000 acres. Soil surveys and a land classification indicates 32,095 acres thereof irrigable, of which 2,776 acres now receive a partial water supply from various sources. With appropriate allowances for rights of way and equivalent areas of full water right in lieu of the area now receiving a partial supply, the net project irrigable area would be equivalent to 28,350 acres receiving a full water supply.—*R. F. Walter, Chief Engineer.*

PROPOSED CONTRACT

The form of contract referred to was approved by the First Assistant Secretary of the Interior under date of June 29, 1926. Although the proposed contract has not yet been executed, the following summary of the terms of the contract form, as approved, may be of interest.

The contract provides for the expenditure by the United States of not to exceed $4,500,000 for (*a*) the purchase of a one-half interest in Warmsprings Reservoir from the Warmsprings irrigation district, (*b*) the construction of a diversion dam in the Malheur River in sec. 6, T. 21 S., R. 41 E., Willamette meridian, (*c*) extending therefrom a canal system consisting of a main canal and branch canals and structures, and (*d*) the necessary drainage works, as found by the Secretary.

In the construction of these irrigation works the United States is, so far as practicable, to utilize the ditch and canal rights of way reserved in patents for land taken up after October 2, 1888 This right of way is reserved in the act of Congress of August 30, 1890, 26 Statutes, 391, a farsighted enactment which has been of great assistance to the National Government in the construction of irrigation works. The district is to obtain by purchase or condemnation any right of way not covered by the Government's reservations.

Upon the completion or termination of the construction program the Secretary of the Interior is to furnish the district a statement of the total amount of the construction costs payable by the district to the United States under the contract. The district is to pay the construction cost as stated by the Secretary. If water becomes available for any part of the project before the completion or termination of the construction program as a whole, the Secretary is to give notice to the district to that effect, describing the legal subdivisions of land for which water is available, and giving the tentative per irrigable acre construction charge payable by the district on behalf of such completed portion of the project. The construction charges are to be payable in 39 annual or 78 semiannual installments. The last 34 of the 39 annual installments are to be equal installments, but the Secretary has the option to provide in said notice for smaller installments during the first five years. It is well known that during the period when raw land is being subdued to irrigation the crop returns, in proportion to the labor and capital spent, are generally small, and this five-year period of relative low construction charge payments would give the new land time to come into full productivity before the owner is called upon to meet the full annual construction charge installments. Where the per irrigable acre construction charge is announced tentatively, the charge is to be adjusted later when the construction program is terminated. The operation and maintenance or rental charges payable to the United States for the first year after the construction charge notice are to be transferred to and paid as a part of the construction payment.

As permitted by the act of Congress of May 15, 1922, 42 Statute 541, the annual construction charge installments may, if the district so desires, be paid one-half on December 31 and one-half on July 1 following, instead of on December 31. This enables the district to pay the United States soon after the district landowners pay their taxes.

After the completion of the construction program the district is to operate and maintain the works, the United States, however, reserving the right to inspect the works to ascertain whether they are being properly maintained. If the district fails to maintain the works properly the Secretary has the option to do needed repair work and charge the cost to the district. The landowners are in all cases to pay operation and maintenance charges in advance.

One of the most important articles in the contract form is that providing for what is known as joint liability and reading as follows: "The district as a whole is obligated to pay to the United States the full amount herein agreed upon according to the terms stated, regardless of individual default in the payment of any assessment levied by the district."

Should the district refuse or fail for a period of more than one year to make any payment due the United States, the Government may refuse to deliver water to the district and may take over the control of the irrigation works for that purpose. The district is to refuse the delivery of water to any land the owner of which is delinquent for more than one year in the payment of his charges.

Until the construction charges are paid in full the district is to employ an irrigation manager who is acceptable to the Secretary of the Interior.

It is a cardinal principle of the Federal reclamation laws that the money of the Government is not to be used for the enrichment of a few large landowners. To carry out this principle two important provisions have been incorporated into the proposed contract, one prohibiting the delivery of water to more than 160 acres of irrigable land in a single ownership, although the excess is assessable as if water were being delivered, and the other providing that an owner of land in the district is to agree that if he sells the land at a price in excess of a fair market price as fixed by an appraisal approved by the Secretary, one-half of the excess is to be turned in upon the project charges. These matters, the drift of land into large ownerships, and the rise and fall of land values are admittedly difficult to control, being as they are a phase of the economic life of the country, but it is hoped that these provisions, and particularly the latter, will aid in preventing those who are to make homes on the irrigated land from loading themselves up with debt for the purchase of their land during periods when land values are unreasonably high.

As stated above, the United States, as a part of the proposed project, is to purchase a half interest in the Warmspring Reservoir. The Warmsprings irrigation district embraces land in the valley, whereas the land that the Government is to reclaim lies at a higher elevation. On September 14, 1925, the Interior Department approved a form of contract for the purchase of a half interest in the Warmsprings Reservoir from the Warmsprings irrigation district. The contract involves a sale of what might be described as a vertical right in the reservoir; that is, after the sale, if there is a shortage of water stored in the reservoir, the owners of land in the Warmsprings irrigation district are to share the available water supply with the United States. An act of the Legislature of Oregon was passed to facilitate the sale, and the court confirmed the sale as legal and valid. Later certain landowners in the district who had defaulted in the confirmation proceedings brought a suit to enjoin further proceedings to effectuate the sale. They alleged among other things that the water rights in the reservoir were owned by the individual landowners in the district, and hence that the district could not make a valid sale of this property. This second case was carried to the Supreme Court of the State, where the power of the district to continue with the proceedings looking to the sale of a half interest in the water rights of the Warmsprings Reservoir was upheld. (Johnson *v.* Warmsprings Irrigation District, 246 Pac. 527.)—*Legal Division.*

Pacific Conference Includes Reclamation

Secretary of the Interior Work, with the approval of the President, has designated the week of April 11 to 16, 1927, as the date for the Pan Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, to be held at Honolulu, Hawaii.

The general purposes of the conference contemplate a mutual discussion of common problems relating to schools, reclamation, rehabilitation, and recreation. It is hoped that the conference will prove a medium for better understanding and relationship between the United States and its neighbors in the Pacific, and will strengthen the Territorial administration in Hawaii and other Territories.

Selecting sweet-potato seed at harvest time will enable the grower to note the yield per hill, the relative size and shape of the potatoes, and the presence or absence of disease.

Community Land Settlement in the Southern States

The Department of the Interior is seeking tracts of land in any part of the South preparatory to field investigations, with a view to engaging the joint efforts of the Federal and State Governments in community land settlement

By Copley Amory, Expert in Reclamation Economics

THE Sixty-ninth Congress appropriated $15,000 to "obtain necessary information" through the Department of the Interior "to determine how arid and semi-arid, swamp, and cut-over timberlands in any of the States may be best developed." Heretofore reclamation has been confined to the irrigation of arid lands.

This step expands the field of reclamation to any State in which the progress of agriculture requires Government direction. It marks a new stage in the agricultural development of the United States. In the older countries of Europe this stage was reached long ago, and in those countries, notably Denmark and Holland, the success of government direction of land settlement has justified its application.

Heretofore the course of land settlement in the United States proceeded upon the theory that, given opportunity for taking up land, the farmer does the rest.

RECLAMATION JUSTIFIED

In the 24 years which have passed since the passage of the reclamation act Mr. Roosevelt's policy of reclamation has been justified many times over in the result of its application to western arid lands. It does not follow from this that the original policy has not required modification in many particulars or that failures of whole reclamation projects or failure of many farmers on several reclamation projects have not taken place. But the modification in the cost of living in those Western States where the projects have been installed has been a tremendous stimulus to the development of those States

The process of land settlement is being investigated by the Department of the Interior in that part of the Nation where the decay of agriculture has proceeded most and where its continued progress threatens the most harm. This obviously is the southeastern cotton States.

It is not broadly understood as to what extent the boll weevil, the economic effects of war and the resulting exodus of the negro, and the drain of the recent Florida development upon all classes of farmers have affected some or all of the Southeastern States.

Cotton is the staple crop of the South. Efforts to introduce diversified agriculture and raising the food supply of the State within the State have proceeded only partially and but slowly.

Mr. N. L. Willett has commented as follows on this situation:

Clemson College the other day told us that the average South Carolina cotton farm in the past five years has given an outturn of only 150 pounds of lint cotton per acre, and that at 18 cents or 20 cents for cotton, this outturn would not pay the farmer out. This means that at present the average cotton farm in the South Atlantic States is practically a liability and not an asset. And so long as our system of farming obtains and so long as we are not increasing crop outturn per acre, why, the above situation is getting worse rather than better.

* * * * *

The South Atlantic farmer, too, at one time had cotton under his control. He had no competition, but to-day he faces one of the most serious competitions that one could imagine. To-day India, Egypt, Sudan, South Africa, and China are fast increasing cotton acreage. India to-day grows over 5,000,000 bales of cotton. At one time the cotton business was on this side of the Mississippi River. To-day over half the cotton crop is made in Texas, Oklahoma, and Arkansas. There they plant two rows of cotton at a time, use practically no hoes, and plant continuously in the row without chopping. They have, too, practically no weevil and they use no guano. They thus grow cotton very much more cheaply than we can do it here. Furthermore, the cattleman in Texas is fast going out of the business, and all grazing lands in west Texas are either now in cotton or are headed that way. To-day these three above States plant 25,000,000 acres of cotton, and Texas alone plants 17,000,000. Thus is competition affecting very tragically the cotton status here in the South Atlantic States, and this competition is growing larger every year.

* * * * *

There is no doubt, and aside from the foregoing, but that the South Atlantic cotton farmer operates under very certain and sad handicaps. We plant, for example, long-spaced cotton. We hoe, we cultivate only one row at a time, and much of our cotton is $\frac{7}{8}$ inch in place of 1 to $1\frac{1}{16}$. The Southwest is herein more efficient and economical than we are. We here, too, use almost exclusively the share-cropper system. Clemson College is authority for saying that more than one-third of them move every year. Now, under a one-year tenantry no agriculture certainly can progress, even if it keps its head above water. One-year tenantry prevents all soil upbuilding and farm improvements. One-year tenantry, in fact, means the continuous depletion of soils. It is our one-year share-cropper tenant that dominates our choice of crops and its cultivation. The tenant herein wants nothing save the cotton farm, and, to begin with, he knows nothing else than that.

The Department of the Interior is seeking tracts of land in any part of the South preparatory to field investigations, with a view of engaging the joint efforts of the Federal and State Governments in community land settlement.

Commissioner Mead has described what land settlement is and what is to be hoped from it in a recent article from which we quote.

Speaking of the Durham Community Land Settlement in California inaugurated by himself, Doctor Mead says:

By mobilizing the expert knowledge of the State in the planning of this settlement, by taking advantage of the experience of other countries in working out the interest rate and the length of time given for payment, by helping the settlers to cooperate in business and social affairs, the hundred farms and the 40 farm laborers' homes at Durham have become a landmark in rural progress that has attracted experts from more than 30 widely separated countries. After a lapse of five years it is a firmly established going concern. The farmers are meeting their payments on land and also the advances made to enable them to live in comfortable houses, own good stock, and work with good tools. The confort and convenience of the farm laborers' homes and the willingness of their owners to do all kinds of farm work have been a revelation to those who thought the American farm worker had degenerated.

A DEMONSTRATED SUCCESS

These farm laborers take part in all the cooperative activities of the settlement; their families share in the social life on an equality with the farm owners' families. Many of them will be farm owners in the future. The Durham colony is very like the American school district of my boyhood. There is the same civic pride in the community; the same interest in education and community affairs. It has, however, a better land tenure and better organized community activities. These can not be broken up by the purchase of farms by nonresidents. Until the farms are paid for, only people who live on them are permitted to become

owners. If speculation had not been thus eliminated, half of these farms would be owned to-day by merchants and capitalists of the Sacramento Valley.

California and the two Carolinas are among the agricultural States that have begun constructive measures to help men become farm owners. In North Carolina 22,000,000 of the State's 31,000,000 acres are unimproved. Only 8,000,000 are cultivated, and among the cultivators are 117,000 landless farmers. These tenants and croppers follow a primitive and destructive kind of cultivation. They take everything out of the soil and put little or nothing back. This has brought low yields, which, joined to a drab, monotonous life, are causing a wholesale exodus of both white and black farmers. The drift is in the wrong direction and needs to be changed. If the State could bring its good land under cultivation it would add $400,000,000 to the yearly value of farm products. But such results will come only through constructive action, based on the idea that land settlement is a public question.

WHERE THE COLONIZER FAILS

In order to bring back these departed families, rural life must be made socially attractive. The easiest way to do this is to create communities where the people will be helped to act together in business and social affairs. The restoration of these idle and neglected fields requires group settlement, each farmer owning his land but touching elbows with his neighbors in many helpful ways.

The lure of farm ownership must be also held out. Money must be provided to help settlers buy and improve their patches of land and equip them so that they can be properly cultivated. That needs the best kind of oversight and far more money than private colonizers are willing to furnish. That has been proved in North Carolina by the failure of many colonies where the land buyer was left to hoe his own row. The colonizer usually is a land salesman only. His interest ceases when the purchaser signs on the dotted line. The sale of the land must be the beginning of responsible oversight in the colony of the future.

THE END OF THE PIONEER

What justifies the abandonment of the heretofore policy of land settlement which has governed the colonization of the continental United States? In Commissioner Mead's words:

The nineteenth century marked the end of the American pioneer. Within its span the frontier moved west from the Alleghenies to the Sierras, where it met the older Spanish civilization of the Pacific coast. It created a life and types of character crude but attractive, and distinctively American. The cowboy and plainsman, two of the most dominant and self-sufficient figures of our history, are already shadowy figures of the past.

Pioneer life ended with the frontier. Equally significant but less colorful changes in rural life took place in the expanding region back of the frontier. The farmer of the first two-thirds of the nineteenth century was a jack-of-all-trades. He was both producer and manufacturer. The country neighborhood was largely self-supporting. The farm bread was made from flour or meal ground from his own grain at a community gristmill. He fattened and slaughtered the hogs that filled his pork barrel. A few sheep furnished the wool for his clothes the cloth being made at a local woolen mill or at an earlier date on the farm. In my boyhood I spun yarn and wove cloth on wheels and looms inherited from my grandfather's larger equipment.

All that is gone. The shrewd and resourceful men of the cities reached out and captured the business, the arts and industries of the farms, and the country neighborhoods. Farm life became less varied, offering fewer interests to its youth, and the more active and enterprising inhabitants followed the tannery, the grist and woolen mills to the city.

Those who took part in this rapidly changing life thought only of the present. Very few realized that as pioneers they were laying the foundations of a future civilization or that they were trustees of resources which had been so recklessly placed in their improvident hands.

DESTRUCTION THAT FOLLOWED THE PIONEER

The enormous wealth of land, mines, and forests made the pioneer and his followers migratory, improvident, and speculative. He robbed the soil of its fertility by the most exhaustive forms of cultivation known to man. He grew corn for which there was no home market, and sold it to Europe for less than the phosphates and nitrates the crop had taken from the soil were worth as fertilizers.

My boyhood was spent on the banks of the Ohio River. The hills which border it had the most magnificent growth of hardwood timber the world has ever seen. Oak, ash, hickory, walnut, poplar, and wild cherry were among the splendid trees that reached straight and tall toward the skies. I saw them disappear like mists before the morning sun, cut down and burned to enable corn and tobacco to be grown. These crops have no binding material in their roots. Planted on steep hillside slopes, the winter rains soon washed away the fertile surface soil which it had taken nature unnumbered centuries to create, and left them scarred with gullies covered only with weeds and brush.

If those hillside forests had been preserved their beauty alone would be a national asset of untold wealth. The land was not needed for cultivation. Our activity was destructive, but I do not recall a single expression of regret. Everyone under 40 expected to move farther west and share in the Nation's bounty of free fertile land. Kansas or Arkansas was the promised land of our community.

Doctor Mead's contemporaries moved on to Kansas and Arkansas and their successors in turn to the western limits of the continent, no better conservators than their forbears. Their improvidence "as trustees" of those vast agricultural resources which "had been recklessly placed in their hands" has raised for us the question of which in part the solution may be community land settlement.

It is fair and pertinent to say in passing our judgment upon these "trustees" of our decaying agricultural resources that the system which they followed and which we in part condemn, while it was "reckless" and wasteful, did not utterly and wholly destroy the value of the great agricultural asset intrusted to them. As to a part of it some agricultural value remains and some they converted, by wasteful methods it is true, into wealth of other sorts. They liquidated a large proportion of the plant food value of our soils and in so doing converted a part of its value into other forms, as railroads, bridges, and buildings, which remain to contribute to the national income.

In the next ERA I will endeavor to show what farm life in this new era of farm history must be and how far this ideal has been attained in North Carolina.

Reclamation Economies Bring Saving of $84,000

The personnel of the Bureau of Reclamation was reduced by 34 permanent employees during the current fiscal year, according to an announcement made at the Interior Department recently.

The reduction was brought about through the relinquishment by the bureau of the operation and maintenance of a number of Federal irrigation projects and divisions which were turned over to the water users. The projects affected were located in the State of Idaho and included several divisions of the Boise project, the King Hill project and the south side pumping division of the Minidoka project. In addition the services of a number of employees were dispensed with by the sale of the Williston project in North Dakota, its operation having ceased with its disposition. Savings as a result of this reduction in personnel amount to approximately $84,000 annually.

Selected sweet-potato seed should be stored in baskets or crates, in a part of the house where they will not come in contact with the general stock.

Engineering Required in Farm Development Under Irrigation

The work of the engineer should not stop with the construction of the major works.—Much can be done for the individual water user to prevent mistakes in planning his laterals, laying out his roads, and properly locating his farm buildings

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

IT is the general conception that upon completion of the canal and delivery of ample water at sufficient elevation above the highest point of the land to be irrigated, the settler should easily be able to successfully do the rest; that no further attention of the engineer is required, and he should move on to other works to be constructed. This may have been possible 50 years ago, but conditions have changed.

SIMPLE METHODS OF THE PIONEER

The pioneer diverted the water from the stream by his simple methods and mostly with his personal labor, with little outlay of cash required. He had little or no money or credit. Perhaps some simple surveys were made or levels established, but generally he located his ditches by following the water. In fact, employment of a surveyor was often not necessary, even if one was available. In the adjudication proceedings instituted on the Big Thompson, one of the first streams to be diverted for irrigation in Colorado, some 40 years later, ex-Governor Brush, who made the first diversion therefrom, testified that he weighed out $300 in gold dust to pay a mining engineer to come from Golden, Colo., about 100 miles away, to survey this ditch. The ditch diverted water at the grade of the stream, was 3 miles long on a straight line, cutting across an ox-bow bend in the stream, and was found to have a grade of 16 feet per mile. As no map was made, I have often wondered what this surveyor did for the gold dust.

Upon exhaustion of these simple opportunities, the settlers combined their efforts and constructed more difficult diversions, still mostly with their combined labor and with little need for money.

WASTEFUL COMMUNITY EFFORTS

Then followed the more difficult diversions requiring investment of capital for construction of community canals to irrigate larger areas, but even then the settler received his water at the main canal, often several miles away, and built his own lateral leading from the canal to his land, or in conjunction with his neighbors, depending on the difficulties encountered or the readiness of his neighbors to join him. These early laterals were generally built without surveys or previous planning and, as in the first case, mostly with the individual labor of the settlers. Except where labor was employed and paid for, they were figured without cost, and, in fact, $1 per acre was the exceptional rather than the usual cost. As may be expected, without prior planning, these early constructed laterals, after land became more valuable, created a great source of damage to the land, by washing great gullies where excess grade was not properly taken care of and by seepage where grades were uneven or insufficient. Many of these laterals have since been combined, relocated, and reconstructed, but the results of the early damage often remain.

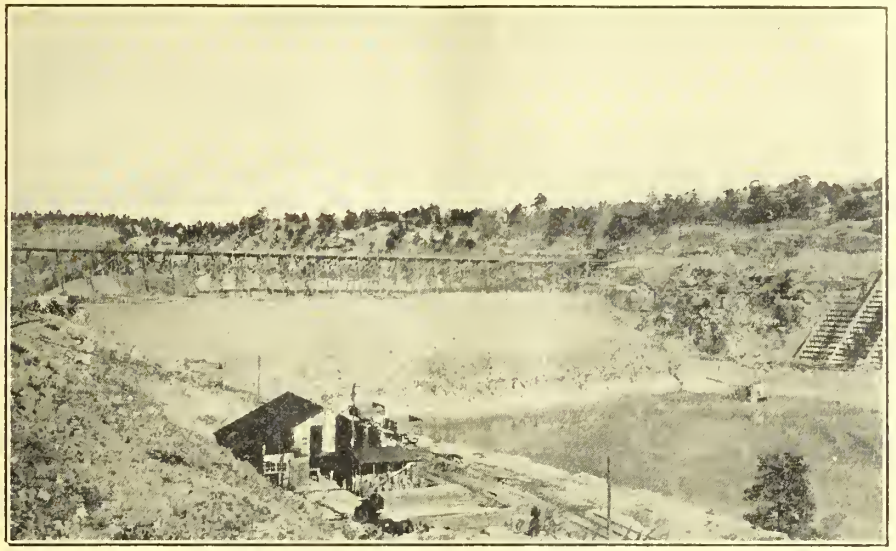
These early laterals were generally built without consideration for right of way and were continued by sufferance until a right by use was acquired and it was then difficult to force the owners to relocate or improve them, as the damage was often not incident to the land of the owners. I know of one old irrigation system in the South Platte Valley—the Farmer's Independent Canal, said to be so designated for the reason that each farmer constructed and maintained an independent lateral to his land. I have seen as late as 1905 as many as eight parallel farm laterals leading through highly cultivated farms, where but one main lateral was necessary. The damage to the land adjacent, from accumulation of weeds and from seepage, to say nothing as to the loss of water and value of the land used, often represents an amount equal to many times the original cost of a well-located and properly constructed lateral system.

Chief Engineer R. F. Walter makes a few remarks to help celebrate the beginning of construction of the Kittitas project, Washington

THE ERA OF LOGICAL PLANNING

Not until the Reclamation Service, in connection with the construction of irrigation projects under the reclamation act, found that many of those ready to irrigate their lands would be delayed in getting the water from the main canals to their lands, on account of the inability of some and lack of initiative of others of their neighbors in financing or joining in the construction of the community lateral, and for this reason the project development was being greatly retarded, did the construction of reclamation projects provide for the logical planning and construction of the lateral system and delivery of water at the land.

The additional cost has been considerable, but I believe those who have given this study, including the water user who must eventually pay the bill, generally agree that the results have justified this program.



Progress at Guernsey Dam on the North Platte project, Nebraska-Wyoming

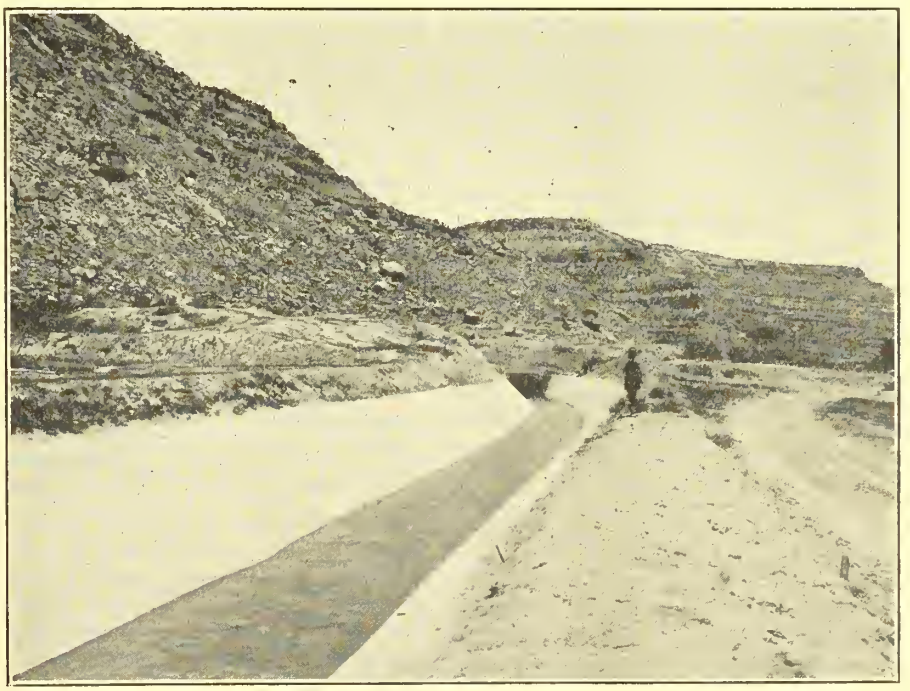
MORE AID TO SETTLERS NEEDED

Even with the construction of the lateral system, the settler has been expected to work out his own salvation after the water is delivered to his land at an elevation sufficiently high to provide a sufficient grade to carry the water to the high point to be irrigated on his farm and in general little or no aid, or only incidental advice, has been furnished him and he has been left to his own resources in planning the best method of irrigation, selection of crops to be grown, building his improvements, and construction of his farm and waste ditches, etc., in all of which it has been found that he needs additional advice and information unless he be, as few of our settlers are, an experienced irrigator.

Where large tracts of vacant Government land, or, by the agreement of the owners, large areas of privately owned lands, are to be opened for irrigation, the farm boundaries should be established with due reference to topography and to physical features, either constructed or to be constructed, where the location thereof can be anticipated in advance. This, of course, is generally not possible where Government lands are interspersed with private lands held in small ownerships, the boundaries of which are defined in accordance with the lines established under the rectangular system of surveys of the General Land Office. In the subdivision of such tracts and establishment of farm boundaries, farms should include lands having, as much as possible, a similar direction of slope so as to permit irrigation from one head lateral and avoid the necessity for more than one delivery to the farm and for the disposal of waste water without damage to adjacent farms. Endeavor should also be made to include land having similar topography, so that the same method or system of irrigation can be used on all the land. They should be so established as to avoid as much as possible the interference of highways, railroads, main canal and lateral lines, and drains, and with such physical features and topography for boundaries rather than the arbitrary section and subdivisional lines. These boundaries should be plainly marked so as to avoid encroachment on canal or drain rights of way required for future maintenance. Special surveys will, of course, be required for description and conveyance purposes, as well as for computing the total and irrigable areas.

ENGINEERING SERVICE FOR NEW SETTLERS

The settler should be furnished with a plat of his farm, upon which is shown the location and sizes of the needed ditches to convey water to the various fields. It should also show the system of irrigation to be followed to apply the proper amount of water to these fields with a minimum of expense for leveling and a maximum of convenience for the future operator of the farm. It can be readily understood that different types of soil and different character of topography will require different methods of irrigation to get the highest results. One field can best be watered by field laterals following the slopes; in other cases the laterals should be on contours and distribution completed by making shallow furrows; in still other cases, borders or ridges should be thrown up at intervals of from 30 to 50 feet apart as guides for the water, which is applied to the plants between the ridges by flooding. The determination of the method of irrigation to be used is an engineering problem requiring not only a knowledge of hydraulics but also a knowledge of soils. If these plats are made before the raw land is developed, and some engineering service extended to the new settler so that he carries out the plan, the settler can be saved from costly mistakes. The inexperienced settler does not understand a contour plat, such as is made of the irri-



Tunnel and lined section, High Line Canal, Grand Valley project, Colorado

gable land before the project is constructed. And, even if he does, the contour interval is usually 5 or more feet and the scale too small to be of much use in planning irrigation methods, leveling of the land to conform thereto, or the construction of the farm or sublaterals. He will often use the common method of "cut and try," which generally means to make the cut and try to dispose of the material as best he can.

MISTAKES OF IRRIGATION

Not long ago I observed a settler on one of our projects who, without surveys, had been working for weeks with several teams trying to level off a small hill which was above the general level of his land, and which could have been irrigated at one-tenth the cost by constructing a little inexpensive dike in his lateral. If he had known the amount of work involved, or been properly advised in advance, he could have saved himself much labor, greatly needed for leveling the balance of his farm. Upon my remark to him that such leveling costs a lot of money, he replied "No, it don't cost anything but it takes a heap of work."

Small structures, such as turnout gates in head ditches, culverts, and checks, require different designs to fit different conditions. Too often they are made too small and frequently they are washed out. Farm ditches should also be designed to carry the proper amount of water to irrigate the fields to be served by them. Too often the farm ditches are too small. Siphons which carry water under depressions can only be properly designed by a knowledge of hydraulics. Very often they are either too small or too large. In the first case it interferes with the farmer's operations, and in the second case the farmer spends more money than is necessary.

THE FARM LAYOUT

To properly develop a farm requires a knowledge of sanitation. The drainage from corrals and barns should be taken care of so that the water will not pollute the domestic water supply. The house should be built at such an elevation so that sewerage can be disposed of through a septic tank. Septic tanks for the disposal of sewerage are recognized in modern farm sanitation, but a septic tank can not be installed if the house is built in low ground and there is no way of disposing of the effluent. These tanks are designed to meet varying conditions and may be built of different materials that can be found cheaply in the local community.

The farmstead layout probably is the least planned of anything on the average farm. There is no relation between the location of the house, barn, poultry house, hog house, well, silo, feeding corral, home garden, or family orchard. All of these have their proper place and as much skill can be used in the proper location of these buildings and conveniences as is utilized by a good architect in planning a convenient kitchen. A farmstead, to be properly planned, should have beauty. The best results are obtained when this is planned by an engineer who has studied the problem.

FARM ARCHITECTURE

The design of farm buildings requires engineering and architectural skill, first, to meet the requirement of the family and livestock and, second, to obtain the best structures for the amount of money expended. In this division of engineering beauty of design should not be overlooked. I have seen small buildings designed for new settlers that were ultimately to be their garages but, in the beginning, were used for dwellings. The windows from the garage would be moved into the house, when it was built, and the fixtures in the small building were made movable. If engineering skill and service is attached to the building program of a new development, the settlers will get more for their money and have conveniences that unplanned buildings do not give. It is equally true that the same skill and knowledge is needed to plan barns and other outbuildings.

PROPER LOCATION OF ROADWAYS

Highways should be provided, where possible, on the upper side of canals or laterals, to avoid construction of lateral bridges and road crossings and where they will be provided with the best grade. Likewise, roads will have to be constructed through the farm in order to serve all of the fields. These should be located with the same objects in view. There is nothing worse than to find farm roads located in the portions of farms that become flooded from the run-off of water, which makes them impassable during the growing season. This can be avoided by proper planning.

HOUSEHOLD WATER SUPPLY

One of the most important things is an adequate and proper supply of domestic and stock water. In some places this is easily obtained; in others, it is more difficult. In some sections of the West the underground waters are alkaline and unfit for use. It becomes necessary, in such cases, to construct cisterns which should be so located as to be free from pollution and at the same time convenient for household use. In recent years use has been made of pressure systems to put water in the house and in the corral, thus saving a great deal of hand labor. There is a proper size of pressure system to meet the need of a family and the livestock. Money can be saved when this is well planned.

FINANCIAL AID IMPORTANT

The existence of an intermediate finance association to aid new settlers without ample means for development can aid greatly and be of the further service to the settler if, combined with their other activities for which organized, they will provide the materials required by the settler, such as fence posts, barbed wire, lumber, paint, and cement, in order that such may be furnished him, in lieu of cash loans, at wholesale prices and eliminate middlemen's profits. This will also make the funds of the association go that much farther.

South Africans Express Appreciation

During August Mr. H. R. Roberts, of the Irrigation Department of the Union of South Africa, and Mr. D. G. Collett, chairman of the Irrigation Board of Graaff Reinet, South Africa, visited the Rio Grande, Yuma, Yakima, Boise, and American Falls projects. On their return to New York Commissioner Mead received from them the following joint letter:

On completion of the fine scheduled tour prepared for us at your office at Washington, we wish to express our great appreciation and thanks not only to the head office but to all concerned who were responsible for making our trip so interesting and successful.

We met with the greatest courtesy and consideration wherever we went and could not help noticing the fine esprit de corps and loyalty to heads of department prevailing everywhere.

We were much impressed by the work undertaken and successfully carried out, and by the bold and courageous policy of your department, also the admirable transport facilities obtaining at the various projects.

We regret that we have not been able to meet you on our return journey.

At their request Mr. George P. Oettle, of the South African Government Tourist Bureau, New York City, forwarded to Doctor Mead a number of booklets relating to travel in South Africa.

Recent Federal Irrigation Legislation

Passed by the Sixty-ninth Congress

BOISE PROJECT, IDAHO

For continuation of construction incidental to the removal of slides and canal relocation, Riverside Canal, Riverside irrigation district, and incidental operations, including the general objects of expenditure enumerated in the second paragraph under the caption "Bureau of Reclamation," contained in the Interior Department appropriation act for the fiscal year 1926, fiscal year 1927, $50,000, to be paid out of the reclamation fund.—Public, No. 492, approved July 3, 1926.

YUMA PROJECT, ARIZONA-CALIFORNIA

To reimburse the reclamation fund for all costs incurred prior to March 3, 1925, and paid from the reclamation fund, for the operation and maintenance of the Colorado River front work and levee system adjacent to said project, as authorized by section 16 (a) of 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, fiscal year 1925, and prior fiscal years, $637,336.

For operation and maintenance costs of the Colorado River front work and levee system adjacent to the Yuma irrigation project, Arizona-California, as authorized by section 16 (b) of the act of March 3, 1925, fiscal year 1926, $50,000, to be transferred to the reclamation fund and to be expended under the direction of the Secretary of the Interior.—Public, No. 492, approved July 3, 1926.

COLUMBIA BASIN

For completing investigations of the feasibility of irrigation by gravity or pumping, water sources, water storage, and related problems on the Columbia River and its tributaries, including the Columbia Basin project, as provided for in the act approved April 13, 1926, entitled "An act authorizing the Secretary of the Interior to cooperate with the States of Idaho, Montana, Oregon, and Washington, in allocation of the waters of the Columbia River and its tributaries, and for other purposes, and authorizing an appropriation therefor," fiscal years 1927 and 1928, $25,000.—Public, No. 492, approved July 3, 1926.

COMMISSION ON THE EQUITABLE USE OF WATERS OF THE RIO GRANDE

The appropriation of $20,000 made by the second deficiency act, fiscal year 1924, for the expenses of a commission to make a study of the equitable use of the waters of the Rio Grande below Fort Quitman, Texas, and continued available until June 30, 1926, by the "second deficiency act, fiscal year 1925," shall remain available until June 30, 1927.—Public, No. 492, approved July 3, 1926.

SNAKE RIVER APPORTIONMENT

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby given to the States of Idaho, Wyoming, Washington, and Oregon to negotiate and enter into compacts or agreements providing for an equitable division and apportionment among such States of the water supply of the Snake River and of the streams tributary thereto.

SEC. 2. Such consent is given upon condition that a representative of the United States from the Department of the Interior, to be appointed by the President, shall participate in the negotiations and shall make report to Congress of the proceedings and of any compact or agreement entered into.

SEC. 3. No such compact or agreement shall be binding or obligatory upon either of such States unless and until it has been approved by the legislature of each of such States and by the Congress of the United States.

SEC. 4. The right to alter, amend, or repeal this act is herewith expressly reserved.

Approved, July 3, 1926, Public, No. 475.

RECLAMATION AND DEVELOPMENT OF MISSISSIPPI SWAMP LANDS

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 be, and he is hereby, authorized and directed to have an examination and investigation made of the swamp and overflow lands on the Yazoo, Tallahatchie, and Coldwater Rivers in the State of Mississippi, with a view to determining the area, location, and general character of the swamp and overflow lands in the valley of the Yazoo River and its said tributaries, which can be developed and reclaimed at a reasonable cost, and the character, extent, and cost of a reclamation and development system of the swamp and overflow lands along the Yazoo River and its said tributaries.

SEC. 2. That the said Secretary shall report to Congress as soon as practicable the results of his examination and investigation, together with a recommendation as to the feasibility, necessity, and advisability of the undertaking, and of the participation by the United States in a plan of reclamation in connection with the development of the swamp and overflow lands in the valley of the said Yazoo River and its tributaries.

SEC. 3. That the said Secretary shall report in detail as to the character and estimated cost of the plan or plans on which he may report.

SEC. 4. That the said Secretary shall also report as to the extent, if any, to which, in his opinion, the United States should contribute to the cost of carrying out the plan or plans which he may propose; the approximate proportion of the total cost which should be borne by the various drainage districts or other public agencies now organized or which may be organized; the manner in which their contribution should be made; to what extent and in what manner the United States should control, operate, or supervise the carrying out of the plan proposed, and what assurances he has been able to secure as to the approval of, participation in, and contribution to, the plan or plans proposed by the various contributing agencies.

Approved, July 3, 1926, Public, No. 517.

HAWAIIAN CONFERENCE

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the President is hereby authorized and requested to call a conference on education, rehabilitation, reclamation, and recreation, to be held at Honolulu, Hawaii, in April or May of 1927; and to extend invitations to such Governments as in his judgment should be represented at the conference.

The Secretary of the Interior, subject to the approval of the President, is hereby given full authority for the inauguration and maintenance of such conference, the preparation of and sending necessary exhibits thereto, purchase of necessary supplies and equipment, for telephone, telegraph, or cable service, freight and express charges, for travel and subsistence of employees of the Interior Department or representatives thereof, and for other necessary expenses incident to the conference, including the employment of assistants in or outside of the District of Columbia, the sum of $20,000 is hereby authorized to be appropriated, from any money in the Treasury not otherwise appropriated, to be immediately available and to continue available until December 31, 1927.

The Secretary of the Interior shall make a report of the proceedings of the conference and a detailed statement of expenditures to the Congress of the United States at the session next following the conference.

Approved, July 3, 1926, Public Resolution 45.

The 1927 Interior Department appropriation act carried an item of $15,000 to provide for the cooperative investigation of the reclamation of swamp and cut-over land and the development of agricultural communities or settlements.

10274—26——2

Reclamation Project Women and Their Interests

By Mae A. Schnurr, secretary to the commissioner and associate editor, New Reclamation Era

Help Yourself and Posterity—Plant Shade Trees

I WONDER how many of the readers of this section gave second thought to the item at page 96 of the June issue, "Beautifying the Project Home Surroundings." This, like succeeding items and articles on trees and shrubbery, is designed to stimulate interest in the subject. It would be our delight to learn of any combined effort on the part of the project people to urge the planting of shade trees in particular. Plant them around the house and grounds; beautify your approaches by lining your highways with trees.

HOW TO PLANT TREES

In planting a tree the first consideration is the kind of soil in which the trees must grow, the climate, and the species that will thrive. Thought must be given to the location of the tree, the space it will have in which to develop, and the variety that grows best in the vicinity. It is well, also, to consider whether it is not better to plant trees of long life, such as the oak or sycamore, instead of trees like the silver maple or poplar that mature after a short span of life. Whatever the choice of the tree, it is deserving of careful thought.

It may be that in near-by wooded sections there are many young trees, saplings, or evergreens. This, of course, makes an easy source of supply, with the advantage of obtaining trees that live well in the vicinity. Experience shows, on the other hand, that it is often more satisfactory to buy nursery trees especially raised for transplanting.

PREPARING FOR PLANTING

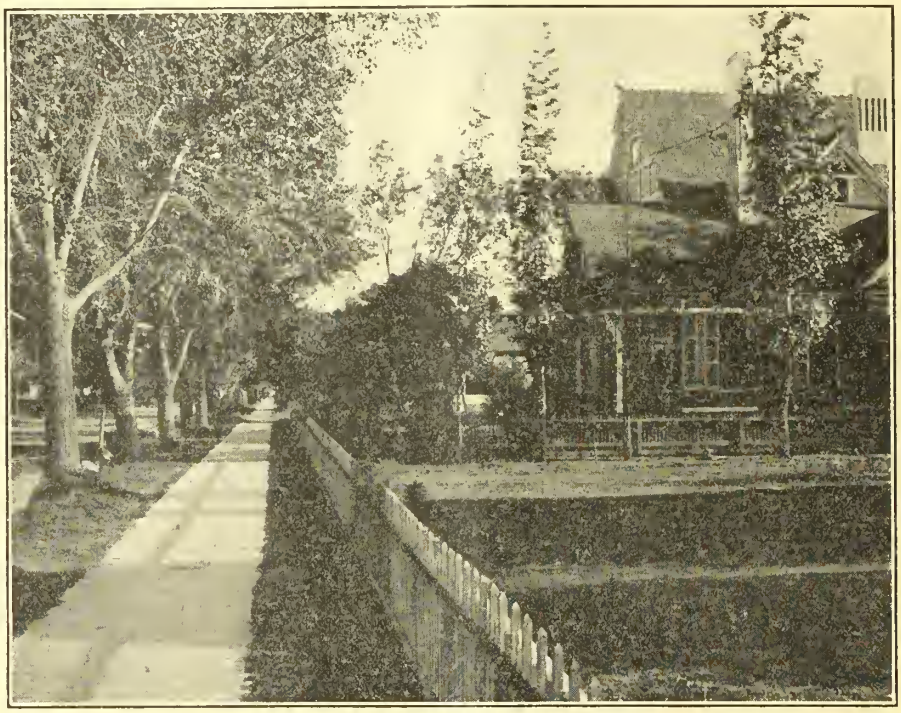
Once the problem of selecting the proper trees has been solved, there come the details of preparing for planting. Care must be taken of the trees. The roots must not be bruised or allowed to dry, and moist earth should be kept around them until just before they are put in the ground. This is extremely important, because of a few moments of ill-advised exposure of the roots to the sun, wind, or dry air will injure the future of the tree. If the trees arrive with broken or bruised roots, these should be pruned, and at the same time the top of the trees can be shaped up. The pruning should be done cleanly with a sharp pruner.

WHEN TO PLANT TREES

There are supporters of both spring and fall as the time for planting deciduous trees. Both have good arguments. If one were to lay down a general rule, however, it would be safe to say that all trees except evergreens can be planted at any time during the period between their going to sleep in the fall and awakening in the spring, and when the ground is not frozen. In the Northern States the early spring is the best time for the inexperienced planter. Evergreens can be put into the ground in the late spring and during the latter part of September and the 1st of October.

A cool and cloudy day is the best for planting. In preparing the hole for the tree it should be made large enough to hold the roots extended normally. It should be deep enough for a 6-inch layer of good loam before the roots are put in. The soil should be carefully worked around the roots. No air spaces should be left, and it is well to soak the soil around the roots so that the tree will stand firmly. Most trees should be planted 2 or 3 inches lower than in the nursery.

There can be no fixed rule for spacing trees. Along streets they will range from 30 to 80 feet apart, depending upon the variety used. Except along highways, it is best to plant trees fairly near together, and the ones that crowd can be cut out later. In field planting spacing of 6 by 6 feet apart each way is generally adopted. This means 1,210 trees per acre.



Picturesque sidewalk in one of our project towns

If the tree planter has not pruned his tree before he put it in the ground, it should be done immediately afterwards. Frequently there is too little rather than too much pruning at the top. The tree top should balance the root system. Many tree planters find it best to remove all the side branches of the deciduous tree, leaving only the leader or main shoot. This leader should not be pruned back in the deciduous variety. There is no need of pruning the top of evergreens at the planting time, and except in the case of some varieties of cedar it is undesirable.

PROTECTION TO THE YOUNG TREE

The work is not over when the tree is in the ground and the soil packed about it. Where there is likely to be strong wind the tree should have the support of a strong stake reaching up into the lower branches. Guards should be around some trees, particularly along the street or in fields where cattle can injure them. For the first two years the base soil will need cultivation. As the trees grow they will need pruning—a question of individual judgment governed by the shape of the tree.

The beauty of a shade tree depends upon its normal and symmetrical growth.

The Nation's Pride

Beautifully shaded homes, parks, highways, and avenues are assets to an individual city, State, or Nation. Once a year, at least, this fact is brought to our attention, on Arbor Day.

With the rapid increase in motor travel and the extension of motor highways throughout the United States, the problems of roadside tree planting and conservation have automatically annexed themselves.

Better than any "Welcome" or "Call Again" sign

HISTORY

The first Arbor Day occurred as early as April 10, 1872. The "Father of Arbor Day" was J. Sterling Morton, who, at a meeting of the State board of agriculture in Lincoln, Nebr., introduced a resolution setting aside April 10 of each year for tree planting. This date was later changed by the State legislature to April 22 to honor Mr. Morton, this latter date being his birthday.

Three years later Kansas and Tennessee took up the practice. Seven years later North Dakota and Ohio followed. Now Arbor Day is observed throughout the country. These pioneer States can proudly point to the small beginning and take the lion's share of the credit for the nation-wide spread of the practice.

TREE-LINED HIGHWAYS

A great deal of attention is given this subject by State officials to govern the extent of the planting, to prevent the obscuring of intersections, to give beauty by natural groupings of trees instead of monotony by even spacing, and otherwise to direct this important work, with the result that at the present time there are 45 recognized highways on which projects for roadside tree planting are under way or are contemplated.

TREES SPEAK LOUDER THAN WORDS

This is almost synonomous with "Say it with flowers." No "Welcome" or "Call again" signs are necessary when the traveler is greeted by good roads and shade trees. He doesn't have to be urged to call again; he is glad to come again because of the first delightful reception he received by your "mute sentinels"—the shade trees.

NEEDS OF THE PROJECTS

There are many project homes without shade trees of any kind. This is not only uneconomical but actually harmful. You are deprived of their protection from the wilting rays of the sun in the summer and the cold blasts of wind in the winter. You do not enjoy the enhancement in value of your property that shade trees effect, to say nothing of the improvement in appearance of the farm home. They also retard evaporation.

ÆSTHETIC VALUE

Beauty in every form has an influence for good. Forms of beauty differ greatly in their effect on persons. Children especially are wonderfully affected for good or ill by their surroundings. The greatest influences are probably seldom realized at the time they are exerted.

Try These

In the "Wanted" column of the August issue of the Era I called for "a good, tried recipe for preserved watermelon rind."

Here is one that has been used for 30 years, also a good recipe for peach pickles, both contributed by Mrs. E. M. Douglas, of Washington, D. C. (Mr. Douglas certifies the results are good.)

WATERMELON PICKLE

Pare off very carefully the green part of the rind of a good, ripe watermelon, trim off the red core, cut in pieces 1 or 2 inches in length, place in a porcelain-lined kettle in the proportion of 1 gallon rinds to two heaping teaspoons common salt and water to nearly cover; boil until tender enough to pierce with a silver fork, pour into a colander to drain, and dry by taking a few pieces at a time in the hand and pressing gently with a crash towel. Make sirup and treat rinds exactly as directed for pickled peaches. Continue adding rinds as melons are used at table, preparing them first by cooking in salt water as above. When as many are prepared as are wanted and they are nearly pickled, drain and finish as directed in peach pickles, except when the sirup is boiled the last time put in melons and heat through; set jar near stove, skim out melons, and put in jar a few at a time, heating gradually so as not to break it; then pour in sirup boiling hot. A rind nearly an inch thick, crisp, and tender is best, although any may be used. If scum rises and the sirup assumes a whitish appearance, drain, boil, and skim sirup, add melons, and boil until sirup is like thin molasses. Don't cook too soft; leave the pieces very firm. Don't cut off red and green too deep; the color will cook out. Be sure the sirup is thick.

PEACH PICKLES

Pare freestone peaches, place in a stone jar, and pour over them boiling hot sirup made in the proportion of 1 quart best cider vinegar to 3 pints sugar; boil and skim and pour over the fruit boiling hot, repeating each day until the fruit is the same color to the center and the sirup like thin molasses. A few days before they are finished place the fruit, after draining, in the jar to the depth of 3 or 4 inches, then sprinkle over bits of cinnamon bark and a few cloves, add another layer of fruit, then spice, and so on until the jar is full; scald the sirup each morning for three or four days after putting in the spice, and pour sirup boiling hot over fruit, and, if it is not sufficiently cooked, scald fruit with the sirup the last time. The proportion of spices to a gallon of fruit is two teaspoons whole cloves, four tablespoons cinnamon.

Another answer to the call was received from Mrs. Emery Bright, Nestledown Farm (North Platte project), Lingle, Wyo.

PRESERVED WATERMELON RIND OR CITRON

Pare off the green skin, cut rind into pieces, weigh and allow to each pound a pound and a half of sugar. Place rind in preserving kettle without sugar and cover with water; scatter a few bits of alum among it and place a thick cloth over kettle. Simmer fruit for two hours. Drain all the water off. Melt sugar, using a pint of water to pound and a half of sugar. Mix with it some beaten white of egg, boil, and skim the sugar. When clear, put in rind and let boil for two hours. Take out rind and boil sirup longer, pour over rind,

and let stand overnight. The next morning boil sirup with lemon juice; slice lemon in thin slices and allow one lemon to a quart of sirup (or less according to taste). When thick enough to hang in a drop from the point of a spoon it is done. Pour over rind which has been placed in jars. Let stand three or four weeks before using.

There are times, as at present, when it seems to us that fortune smiles throughout our land, and that the horn of plenty stands tilted, ready to spill its contents over our part of the project even to the utmost limits of lateral D–56. But again there are days when it seems that we must yield to the assault of the hard siege of adverse conditions, and it was on such a day that the following lines, which we offer here with apologies to Edgar A. Guest, were written.

A HEAP O' LIFTIN'

It takes a heap o' liftin' in a Wyoming homestead shack,
A heap o' coal an' water and you're like to break your back
Before you really know it, or come to understand,
By trudgin' of 'em daily, with 'em always in your hand.
You've got to maneuver an' scheme, an for years you've got to plan,
An' learn to make a dollar go further than a dollar really can.
An' you must work both night and day; you've got to never stop.
You've got to lift each water pail an count its every drop.
You've got to feel the weight of coal, be it anthracite or slack—
It takes a heap o' liftin' in a Wyoming homestead shack.—*L. B. H., Shoshone project, Wyoming.*

Harvesting Time Means Canning Time for the Housewife

CHOOSING fresh fruits and vegetables for canning, proper processing, and air-tight sealing are the three steps toward success in home canning.

Successful canning is based on an understanding of the causes for the rapid spoilage of fresh foods and on a knowledge of the methods by which this spoilage may be prevented. One of the causes of spoilage is the presence of substances called "enzymes" in all fresh fruits and vegetables. These enzymes bring about the normal ripening of the products, and unless checked they bring on final decay. The heat of cooking and canning checks their action, so it is only necessary to prevent the changes they may bring about between the time the material is gathered and the time it is cooked or canned. This is the reason for the emphasis upon canning fruits and vegetables as soon as possible after the have been gathered.

The second and more important cause of food spoilage is the action of minute organisms which are present in the air, soil, water, and, in fact, on everything—yeasts, molds, and bacteria. Yeasts and molds are easier to kill than bacteria and do not cause so much difficulty in canning. Many kinds of bacteria are able, when unfavorable conditions arise, to go over into a so-called spore form, in which they are very difficulty to kill. For this reason bacteria are the chief factors to be considered in canning. If all bacteria are killed and the product is sealed steaming hot within a sterile air-tight container, the food is said to be sterilized. The application of heat to foods during canning in order to kill bacteria is called processing.

The presence of air has always been associated with food spoilage, owing to the fact that these small plants are present in the air even though they can not be seen with the naked eye. When unheated air comes in contact with food it spoils, not because of the air but because of the bacteria, yeasts, and molds it contains.

HOT PACK—IMPROVEMENT ON OLDER METHODS

The hot pack in home canning is just what the name implies. It is a method of packing fruits and vegetables in the containers ready for processing in boiling water or under steam pressure; it is not a complete method of canning. The hot pack helps to cut down the chances of spoilage, but it is the processing which follows that destroys the most troublesome bacteria. The hot pack is recommended for some fruits and all vetegables.

The hot pack is in no sense a revival of the old-fashioned open-kettle canning. By that method the food was cooked until tender and supposedly free of bacteria in an open vessel, then filled into sterilized jars, sealed air-tight, and stored. Unfortunately, into the jars with the food went bacteria from the air, from ladles used in filling, and sometimes from the hands or cloths that accidentally got in the way. Sometimes these bacteria were sufficient to cause spoilage, sometimes not. It was chiefly a matter of luck.

The hot pack followed by processing in water-bath or steam-pressure canner is an essentially different and much surer method. The food is packed hot; then it is processed in sealed containers. This heat of processing kills the bacteria that were in the food when it was packed, and the air-tight seal prevents any more bacteria from entering.

Taking proper precautions in the preparation of food, which costs labor or money or both, means the practice of thrift and the safeguarding of the family's health.

It is wasteful to allow food to lose its attractive flavor or appearance; moreover spoiled or infected food may be actually dangerous to health or even to life.

Preserving is often the solution.

An October scene on one of the projects

The Utah Poultry Producers' Cooperative Association

An organization started in 1923 which now comprises 1,600 members—The turnover on eggs alone this year will amount to more than $2,000,000—A fine example of cooperative effort, standardization, and efficient management

By W. L. Whittemore, superintendent, Strawberry Valley project

THE Utah Poultry Producers' Cooperative Association is the outgrowth of a determined effort on the part of the poultry producers of the State to secure better prices for their products through standardization and cooperation.

Prior to 1922, the State of Utah was an importer of poultry products. Large shipments of dried albumen for use of candy factories and bakeries were also imported from China. In 1922 seven carloads of eggs were exported from the State.

ORGANIZED IN 1923

At the time the association was started in 1923, producers were receiving in the neighborhood of 12 to 15 cents per dozen for eggs, while in New York eggs were selling at 75 cents or more per dozen. This discrepancy in price showed the economic necessity for bringing the producers and consumers more closely together through some form of cooperative marketing association. With the passage of the cooperative marketing bill, which permitted poultry growers to organize, the Utah Poultry Producers' Cooperative Association was formed under the leadership of Mr. Benjamin Brown. The organization as at first formed embraced only the counties of Sevier, Sanpete, and Juab. It has continued to grow until at the present time it embraces the entire State, operating six grading plants at Richfield, Provo, American Fork, Draper, Salt Lake City, and Ogden.

The shipments during the first year were 84 carloads; during 1925, 355 carloads of graded eggs were shipped, and it is anticipated that during the present year the total shipments will be in excess of 500 carloads, representing a turnover in excess of $2,000,000.

The association is duly incorporated with 300,000 shares of stock, par value $1 per share. Each producer purchases stock at the rate of 1 cent per dozen for all eggs marketed through the association. As the producers could not afford to wait an indefinite period for their money the association adopted the plan of paying the producers the price per dozen at the nearest consuming markets such as San Francisco or Los Angeles now supplied by local agencies. The difference between this basic price and the final selling price of the eggs in New York market or other eastern markets was in consequence a profit to the producer and accordingly prorated at the end of the year, with the exception of the 1 cent per dozen for purchase of stock and other deductions for overhead expenses of the association in marketing the eggs. The producers each year have voted to apply this difference to purchase of stock for creating a good working capital.

MARKETING EGGS

Egg shipments are received at the plant and graded before payment is made, the producer receiving the standard price for each of the several grades into which his shipment of eggs has fallen. Eggs are graded into five classes. No. 1 are extra selected eggs, white, uniform in size and color, shell texture, and content, weight 22 ounces or more per dozen. No. 2, selected eggs, slightly soiled, slightly variable in shape, slightly creamy in color, weight 22 ounces or more per dozen. No. 3, standard eggs, may be slightly soiled, imperfect shell, any color, good quality, weight 22 ounces or more per dozen. No. 4, Mountaineer, includes all underweight rejected eggs from grades 1 and 2, weight 18 ounces or over per dozen. No. 5, pullets, includes underweight rejected eggs of standard grade.

All checked eggs are sold locally at the prevailing market price or are broken and the whites separated from the yolks. These segregated parts are each canned and frozen. This product finds ready sale to candy factories and bakeries and is gradually replacing the previously imported powdered albumen from China.

Eggs containing blood specks, broken yolks, and which are otherwise unfit for human consumption are sold back to the producers for baby-chick feed or to fox farms.

The only eggs placed in cold storage by the association are those put away for regular trade. These are carefully graded before storage and are usually processed by being first dipped in hot paraffin oil heated to sterilized heat of 190° F. and then immediately run into cold oil, which seals every pore. These eggs, upon removal from storage, are again regraded before shipment.

POULTRY AND BABY CHICKS

In addition to grading and shipping of eggs, the association also engages in the marketing of live and dressed poultry. During 1926, 14 carloads of live poultry have been shipped out. These are usually the roosters received in purchasing young chicks and are from 9 to 12 weeks old, weighing 1¼ to 1¾ pounds apiece, and bring prices ranging from 18 to 20 cents a pound. Seventy thousand birds have also been dressed and put in cold storage for future sale.

During 1925 more than 260,000 baby chicks were imported by the association for its members. The association now has under advisement the establishment of its own hatcheries from which baby chicks will be sold at cost to producers.

The association also ships in and mixes for its members chicken feed, the cost of which is prorated to the producer at considerable saving.

The association also handles live and dressed turkeys and last year secured 40 cents a pound for all turkeys marketed through it.

MEMBERSHIP

The association at present comprises 1,600 members throughout the State, with main offices at Salt Lake City and managers at each of the six association points; also, a director of sales in New York City. The association has been fortunate in securing the unqualified support of local banks in all their undertakings. This has been primarily through the confidence placed in the excellent personnel of the association's directors.

These are some of the accomplishments of the Utah Poultry Producers' Cooperative Association. It is a fine example of what can be done through cooperative effort, standardization, and efficient management. The writer is indebted to Mr. N. S. Lofgreen, manager of the Provo plant of the association, for most of the information contained in this article.

Age Limits Announced For Civil Service Jobs

The Civil Service Commission announces that in the future the maximum age limit for clerical positions, such as clerk, stenographer and typist, typist, bookkeeper, etc., will be 50 years. The present minimum age limit of 18 years will be continued.

Onion Seed Growing on the Uncompahgre Project, Colorado

A remunerative crop for the experienced grower who knows his onions—The necessary steps to be taken in planting, irrigation, cultivation, and harvesting told in a convincing manner

By A. L. Franklin, Uncompahgre project

Mountain Red Globe onion seed, grown by A. L. Franklin on the Uncompahgre project, Colorado

ONE of the largest growers of onion seed in the United States has described Mountain Danvers onion as follows: A medium large apple-shaped amber yellow variety of more than usual merit. Mountain Danvers itself is not a new onion, but this strain is and it really deserves a new name.

Our stock was grown with all the painstaking care that one gives to the most exclusive stock seed. Among a list of some 250 lots of onion samples growing for inspection at our trial grounds at Laurellone, near San Carlos, the most conspicuous, the best keeper, the most uniform was this sample of Mountain Danvers.

The color is peculiarly attractive, being a clear amber or a yellow with a tint of brown. The uniformity of the strain is easily distinguishable, since the size, shape, and color are unusually uniform for a yellow onion. The variety has impressed us as one particularly adapted for market purposes.

HISTORY

When I came to the Uncompahgre Valley in the spring of 1912 I found several small patches of onion seed which was grown for local use only. In the winter of 1913–14 my brother, W. L. Franklin, and I sold Henry Field Seed Co. 200 pounds. This firm was the first to catalogue this seed, and gave it the name "Mountain Danvers."

When we began growing this onion the bulbs were rather flat, but by selecting the best globe shape we could find each year it is now described and sold by most seedsmen as a globe or apple shape.

The Mountain Red Globe was developed by the writer by taking a good strain of South Port Red Globe, and by selecting each year only the finest bulbs for stock seed it is now almost as early as Mountain Danvers, maturing perfectly in our high altitudes. Henry Field Seed Co. were the first to introduce this seed. They also gave it the name.

Each year we select a few sacks of bulbs of each of these two varieties of good size, shape, and color for stock seed to improve the stocks and develop new strains.

DEMAND

The demand for our seed has often been greater than the supply. The writer and his brother are now supplying 15 seed firms. Much of this is shipped to the East, going as far as Boston. Many short-season localities are now growing large crops of fine quality onions from this seed. Only a few years ago Idaho had only a few acres of onions. This year, according to Government reports, the State has 1,800 acres grown almost exclusively from Mountain Danvers and Mountain Red Globe seed.

Our 1926 crops have yielded well, with seed of fine quality. The writer has 3 acres expected to make 1,500 pounds per acre. Franklin Bros. will have 25,000 pounds for shipment in the winter of 1926–27.

PLANTING

Bulbs for seed growing should be planted as early in the spring as soil can be worked, as an early start is a most contributing factor in getting a maximum yield. We began planting for the 1926 crop on February 8 and completed the job on the 27th.

In planting furrows are made about 5 inches deep and 30 inches apart. Bulbs are distributed as evenly as possible into the furrows from sacks, then each bulb is placed upright so they almost touch each other in the row. About 15,000 pounds of bulbs are planted to each acre. Bulbs should be sound, medium large, and unsprouted. Very small or very large bulbs make few seed. Bulbs are covered with a two-horse cultivator. After planting is completed the ridges left by the cultivator in covering should be harrowed almost level.

IRRIGATION

Intelligent use of water for irrigation is an important factor in growing onion seed successfully. Land should be of even grade and care taken to have the field wet uniformally. All head ditch banks should have blue-grass sod and by means of small boxes water may be controlled at all times and each row may have only enough flow to reach the end without washing or waste of water.

We have found if too much water is used when plants are in early stages of growth, weak spindling seed stalks may result which are easily blown or broken by wind. In advanced stages of growth overirrigation may cause blight.

We irrigate onion seed two or three times from planting to last cultivation. When plants are ready to bloom the soil must be wet thoroughly every 6 or 7 days until about 10 days before harvest, when irrigation is dispensed with.

CULTIVATION

Cultivation should follow each irrigation so long as a cultivator can be used without bruising or breaking the seed stalks. The plants even in the early stages of growth have many fibrous roots, which increase in number as plants get larger. These roots should not be disturbed in cultivation, hence shallow cultivation and not too near the plants. A 14-tooth harrow or 5-tooth cultivator are the best implements to use. After plants are in head a cultivator should not be used, as seed stalks are tender and are easily bruised or broken. When furrows for irrigation are made after the last cultivation, some soil should be thrown to plants leaving the row somewhat ridged. This will help to keep the plants upright.

HARVEST

It is difficult for an inexperienced grower to determine just when onion seed should be harvested. If allowed to become overripe the seed may fall out upon the ground, while if cut too green the seed may be almost impossible to cure.

About three weeks from blooming the crop should be watched closely and where a few pods are found opening and exposing the seed the crop is ready for harvest.

We use wire baskets commonly used in spud and onion harvest. These are lined with cloth or burlap. The basket is carried in front attached to a belt around the waist. The heads are cut with a knife and placed in the basket. When a basket is filled the contents are dumped into a burlap sack. To facilitate drying we dump only one basketfull to a sack. The sacks are placed on seed stalks for curing which, if the weather is dry and hot, will be completed in about two weeks. The seed must be dry before storing or it will heat and spoil. To hasten drying the sacks should be shaken and turned every three or four days. If there should be rain the sacks must be shifted as soon as the ground has dried. After the seed is threshed it is cleaned as well as possible with a fanning mill. As onion seed is light in weight low speed must be used when using a cleaner. Water must be used to complete the cleaning. After water cleaning the seed is dried on wire-cloth trays placed in a sunny place.

CONCLUSION

Some seedsmen have expressed the opinion recently that the Uncompahgre Valley should take up seed growing in a large way.

The Federal Capital of Australia

An Example of Successful Rural Planning

WITHIN a few months the Parliament of the Commonwealth of Australia will meet at Canberra, the new Federal capital, the Duke of York going out from England to participate in the opening ceremonies. This Federal capital has an interest to the people of the United States because Australia followed in the footsteps of this country in the selection of a capital site in the creation of a capital district and adopting comprehensive plans for future development.

The Federal capital is in the State of New South Wales. For this the Government acquired a district of 940 square miles. It controls the headwaters of the stream that furnishes the city water supply and enables the river to be included as an essential part of the provision for parks and recreation.

Competitive designs for the city were invited and the first prize was won by Walter H. Griffin, of Chicago, Ill., who was employed for a number of years in supervising development under his plan. It had been the purpose to have an international competition for the designs of the Parliament buildings, but this was interrupted by the great war, and the first Parliament will be held in a capitol planned by local architects to meet present rather than future needs.

The great cost of land and city improvements caused considerable anxiety for fear the expenditure would be a burden on the nation's taxpayers, but now that the streets have been laid out, waterworks completed, Parliament buildings erected, and the date for Parliament to assemble fixed, rendering it certain that there will be a capital city, these misgivings are ended.

Now that the city is ready for settlement, the Government is selling leases for 99 years, on lots wanted for business or residences.

The second sale of leases aroused widespread interest. Buyers were present from Sydney and Melbourne, and other parts of New South Wales. There was spirited bidding, particularly for the 18 retail trading sites in the civic center at Ainsile. Prices showed a considerable advance as compared with those obtained at the auction in 1924, and the upset prices of the leases were largely exceeded. Bank and insurance companies secured sites in the retail trading center, and the values for sites purchased in this sale were 150 per cent higher than the banks paid 18 months ago. The Commonwealth Bank gave £5,600 for a corner block, and on the next corner the Bank of New South Wales secured a block for £5,200. At the 1924 sale the highest price was paid by the Commercial Banking Co. of Sydney (Ltd.), who bid £2,050 for a corner block, and another block was secured by the Bank of Australasia for £1,550. Among the purchasers at the civic center on May 29 were the Commercial Bank of Australia (Ltd.), who paid £2,700; the Australian Provincial Assurance Co., two adjoining blocks at £2,300 and £2,600, respectively; and the Royal Insurance Co. (Ltd.) for a block. In the residential areas of South Ainslie, Blandfordia, Telopea Park, and other subdivisions, 21 residential blocks were sold for an aggregate of £7,480. The total sales amounted to £46,580, and this will produce an annual rent of £2,329. Bidders pay 5 per cent of the amount bid and 5 per cent on the unimproved value of the land after each 10-year reappraisement.

In the residential areas the conditions provide that the minimum cost of buildings to be erected shall be $5,000 in South Ainslie, $6,000 in Telopeo Park, and $7,500 in Blandfordia. Recently the lease of a quarter of an acre was secured at auction for a picture show for $35,000. This land was purchased by the Commonwealth for $15 an acre.

The Government official in charge says the indications are now that the entire expenditure of the Government will be repaid in 25 years.

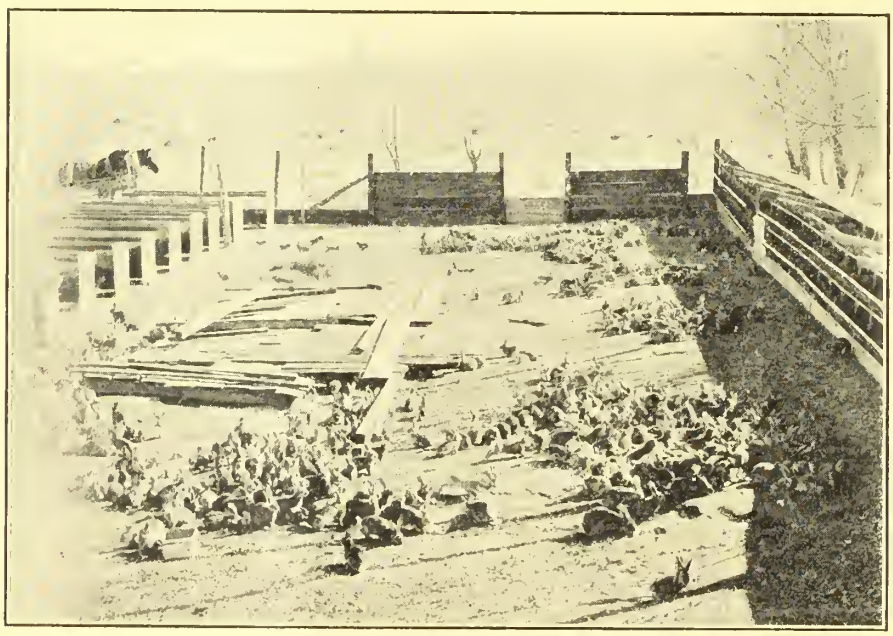
The Rabbit Industry on the Newlands Project, Nevada

A growing industry which is bringing pleasure and profit to a number of water users—New Zealand Red is the favorite breed, with some Flemish Giants and Belgian hares

By H. M. Knobloch, purchasing agent, Newlands project

THE rabbit industry has in the past few years become a lucrative source of revenue to many farmers on the Newlands project. There are quite a number of breeders with from 500 to 3,500 animals, among the largest being C. M. Powell, of Swingle Bench. Mr. Powell has on hand approximately 3,500 animals, including breeding stock and those that are practically ready for the market.

The New Zealand Red is the favorite breed for eating and is shipped principally to Sacramento, San Francisco, and other market points in California. Rabbits are ready for the market when from 3½ to 4 months of age and weigh from 3 to 3½ pounds at this age. There are some Flemish Giants and Belgian hares raised, but the commission men, to whom the majority of the rabbit raisers ship, prefer the New Zealand Red, which although smaller than the other two breeds have a finer grade of meat.



Young rabbits being fattened for market

Does are usually bred when 6 months of age and will kindle from 4 to 9 young, the average young raised being about 7. Some does kindle as high as 11 and 12, but these are exceptional cases. The young are weaned when 1 month old, and mature does will average five litters per year during their lifetime. The does are usually kept until they about 2½ years of age, when they are then killed for the market, although some breeders keep their does until they are 3 years old. Old does do not bring the same price on the market as young rabbits, usually being about 5 cents per pound cheaper. Young bucks are first used for breeding when they are 6 months old and are usually kept until about 1 year old, although some breeders keep their bucks for a considerably longer period. These are also killed and shipped to the market, the price being about the same as for old does, unless they are too badly scarred from fighting, in which case they are killed and thrown away. It is the general practice to keep 1 buck to every 8 does in pens about 6 by 8 feet, although some breeders put 5 bucks with 40 does in pens 10 by 10 feet. When this latter method is used, there is some loss on account of bucks fighting, but the breeders who use this method claim that the loss on this account is less in dollars and cents on account of the time and space saved. Other breeders keep their bucks in separate pens and the does in pens about 10 feet square. Each week the does are examined and when they become heavy, usually about a week or 10 days before the young are born, they are placed in separate hutches until the young are weaned, when they are placed back in the breeding pens.

PREPARATION FOR MARKET

Young rabbits when fed grain will grow faster and attain a weight of 3 to 4 pounds more quickly than those fed alfalfa exclusively. However, the majority of breeders have found that it is cheaper to keep the young rabbits a month longer on alfalfa ration rather than grain on account of the high price of the latter. The quality of the meat is just as delectable when fed alfalfa as when fed grain.

In preparing the rabbits for market raisers usually kill and clean the rabbits in the late afternoon. They are then placed in sacks and taken to the local ice plant, where they are placed in storage and shipped out the next day by express, reaching their destination in fine shape. They are hog dressed, being shipped with their skins on.

Although the price of rabbits varies during the different seasons of the year, an average price of 27 cents per pound dressed is considered a fair average. Some breeders have received as high as 42 cents per pound in the fall; on the other hand, the price in the summer has been known to drop as low as 17 cents.

COST OF RAISING

It has been found impossible to secure from the farmers themselves the exact cost of raising rabbits for the market; however, the Department of Agriculture some time ago conducted an experiment to try and arrive at the cost of producing young rabbits for the market. Thirty young rabbits with an initial weight of about 1 pound each at 1 month of age were placed in a separate pen. At the beginning of the experiment these young rabbits consumed hay at the rate of 15.8 per cent of their weight each day. They produced 1 pound of gain for 7½ pounds of hay and made an average gain daily of 1.9 per cent. These rabbits were fed good third-crop alfalfa hay only. With hay at $10 per ton they produced meat at 4½ cents per pound live weight, which is by far the cheapest production secured on any meat animal.

Young rabbits when being raised for market are placed in pens approximately 10 by 10 feet with wooden top and floor and with all sides covered with wire netting. In these pens are placed from 125

(Continued on page 181)

New Clubhouse of the Naches Heights Community Club

THE Naches Heights Community Club, made up of the residents of Naches Heights, one of the most beautiful sections of the Tieton division of the Yakima project, Washington, has just completed an attractive and commodious clubhouse, a view of which is shown in the accompanying illustration.

The club is incorporated under the laws of the State of Washington, with 125 stockholders, all landowners of Naches Heights, with the following officers: President, C. E. Udell; vice president, Lloyd Garretson; secretary-treasurer, Arthur J. Weeber; trustees, William McKinney, C. C. Bemis, Russell Bush.

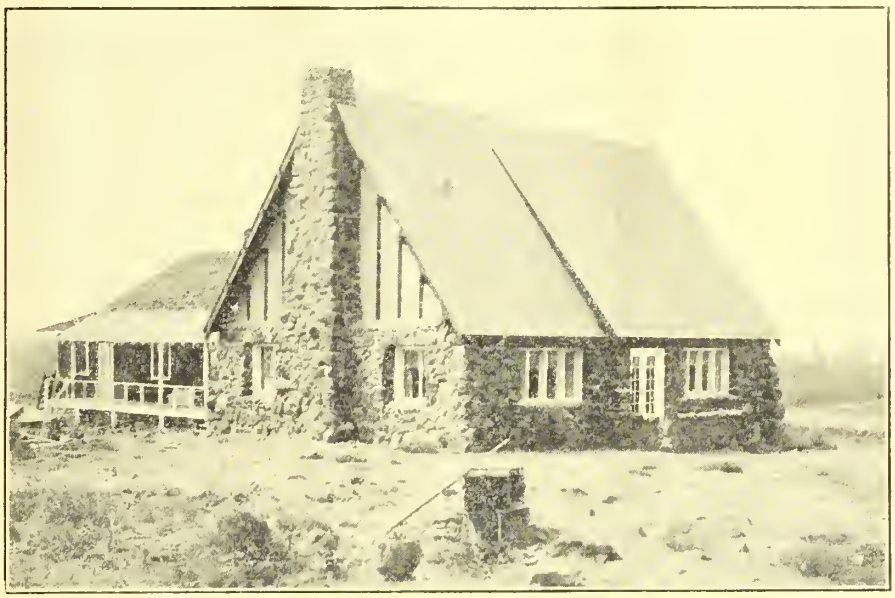
The completion of this clubhouse is the result of the united effort and work of the entire club, with the principal features of the undertaking being handled by the following committees:

Building committee: Lloyd Garretson, Russell Bush, Mrs. C. Gay Wever.

Soliciting committee: Arthur J. Weeber, John Rued, John B. Weeber, C. C. Bemis, William McKinney, C. E. Crownover.

Site committee: Walter Hansen, Mrs. A. M. Ernsdorff, Dan Williams.

The clubhouse is ideally located on what is locally known as the Naches Ridge Road, the county highway from Yakima to Tieton City, one of the most scenic and best maintained gravel-surfaced roads in the county.



Naches Heights Community Club House, Yakima project, Washington

The building is T-shaped, with the main part 30 by 45 feet, built of native lava rock, forming the assembly room, and a 25 by 45 foot annex, made up of the old community building, forming the dining room and kitchen. There are folding doors between the dining room and main assembly room, which make it possible to throw both rooms into one, forming a large meeting room. It is modern in every respect, with hardwood floors, electric lights, water piped in from a concrete cistern on the premises, and hot-air heat.

The club started out to build a clubhouse that would cost about $10,000, including the old building, and $8,262.99 has been spent to date on the new structure, the greater part of which has been paid into the club in stock subscriptions.

The clubhouse is a monument to the cooperative and progressive spirit and ideals of the community, and the membership of the club is to be congratulated on its accomplishment. While the entire club labored diligently to secure this community improvement, special credit is due Mr. Lloyd Garretson, a member of the board of trustees of the Tieton Water Users' Association, who resides on and operates one of the largest fruit ranches on Naches Ridge, and as chairman of the building committee spent a great deal of time in supervising details while the building was being constructed.

The final dedication of the building was celebrated on the evening of August 4, the large crowd present being made up of water users from all parts of the Tieton division and a great many business men and their families from the city of Yakima.

Above their cash income from the farm, farmers have other income in the form of food products which they set aside for consumption by their families, use of houses for their shelter, and some fuel for use in their homes.

Rabbit Industry on Newlands Project

(Continued from page 180)

to 210 animals according to size. An ample supply of fresh, cool water and alfalfa hay is supplied each pen throughout the growing period.

There is practically no disease among domestic rabbits on the Newlands project when they are carefully handled, owing, it is thought, to the extremely dry climate. Very few animals are lost through diseases sometimes prevalent among wild rabbits.

Practically all of the breeders sell through commission men, and it is estimated that the shrinkage, commission for selling, and express charges amount to approximately 3 cents per pound.

RAISING FOR FUR

Mrs. C. I. Teel is the most extensive breeder of the fur-bearing rabbits. In addition to a fine breed of New Zealand Reds which she raises for the market as well as for sale as breeding stock, she raises the Chinchilla and American Blue. The Chinchilla is about the same size as the New Zealand Red and their hides bring from $1.50 up, according to its condition. Their fur is prime when they reach the age of 5 months and each three months thereafter. The American Blue is about the size of the Flemish Giant and the price of its hide at the present time is a little lower than the Chinchilla. In raising these latter two breeds it is not only possible to sell their hides but the meat as well. The chief drawback in the raising of these animals is the original cost. Does when 6 months old sell for $10 to $25 each, according to their size, condition of their fur, etc. The price of bucks is about the same. The fur-bearing animals are raised as easily as any other breed and appear to be as hardy and free from disease.

Organization Activities and Project Visitors

R. F. WALTER, chief engineer, visited the Guernsey and Jackson Lake Dams and the Riverton project during August.

S. O. Harper, general superintendent of construction, visited recently McKay Dam, Ontario, Boise, American Falls Dam, King Hill, Vale, Owyhee, and Umatilla projects.

George C. Kreutzer, Director of Reclamation Economics, was in the Denver office the first half of August, leaving on the 14th for a trip covering the Alcova-Casper pumping units, the Saratoga-Encampment project, and other investigations throughout the Northwest.

C. C. Elder, assistant engineer, continued hydrographic work on the Rio Grande and tributaries between Embudo and San Marcial, making stream-flow gaugings, collecting silt samples, installing and reading drainage wells, setting soil evaporation tanks, and installing meteorological equipment obtained from the United States Weather Bureau.

Andrew Weiss, Assistant Director of Reclamation Economics, has resigned, effective September 30, to be associated with the J. G. White Engineering Corporation in Mexico.

Homer J. Gault has been designated construction engineer of the Stony Gorge Dam, Orland project, and Ralph Lowry construction engineer of the Gibson Dam, Sun River project.

W. L. Drager, assistant engineer in the Denver office, has submitted his resignation to accept a position with the J. G. White Co. on construction work in Mexico.

Kenneth B. Keener, assistant engineer, has been transferred from the Boise to the Denver office.

A committee has been appointed to study operation and maintenance methods and results on various irrigation projects throughout the West. The personnel of the committee comprises Porter J. Preston, representing the Bureau of Reclamation; L. N. Holt, representing the Bureau of Indian Affairs; and Ray Carberry, representing private interests. The investigation will probably cover five reclamation projects, five large private projects, and two Indian projects.

Miss Cora B. Brownell, clerk on the Yuma project, has resigned, and the vacancy has been filled by the transfer of Miss Elisabeth von Hagen from the Grand Valley project.

A Belle Fourche project wheat field

W. C. Matthews, special assistant to the Attorney General in direct charge of the Orland water-right adjudication suit, spent 10 days on the project familiarizing himself with the Stony Creek watershed.

The following representatives of contracting firms inspected the Stony Gorge Dam site on the Orland project recently: H. Stanley Bent, vice president, L. T. Grider, general superintendent, and M. H. Sloeum, superintendent at Exchequer Dam, all of Bent Bros. (Inc.); Guy F. Atkinson, general contractor, of Portland, Oreg.; Oro McDermith, president Derbon Construction Co.; William Smaill, chief engineer Northern Construction Co., Stewart & Welch (Inc.); Nat McDougill, vice president and secretary, and V. C. Wrenn, of A. Guthrie & Co. (Inc.); J. Q. Barlow, Utah Construction Co., San Francisco, Calif.; Willard T. Cannon, Lynch-Cannon Engineering Co.; D. B. Fegles, president, and Charles R. Conkey, vice president and general manager, Fegles Construction Co.; W. B. Clapp and J. B. Bruce, S. W. Stewart and E. H. Burroughs, president and vice president, respectively, of the Ambursen Dam Co.; W. L. Carey, president, J. B. Bertrand, and C. W. Hotaling, of the Allied Contractors (Inc.), accompanied by Engineer U. S. Marshall of the Southern Surety Co.; J. C. Gist, engineer for the Ross Construction Co.

Miss Annie E. Higgins has been transferred from the Shoshone project to the Grand Valley project to fill the vacancy caused by the transfer of Miss von Hagan to Yuma.

Professor Potter, of the animal husbandry department of the agricultural college of the State of Oregon, spent a day on the Uncompahgre project studying agricultural and livestock conditions.

Marcelo Leon, an engineer with the Mexican Government, was a recent visitor to the Boise project.

A party of home seekers from Iowa, Wisconsin, Minnesota, and South Dakota, sponsored by the Northern Pacific Railway Co. and accompanied by business men, officers of the Great Western Sugar Co., railroad officials, and the

A field of Yuma project cotton

county agent, visited the Huntley project recently. Luncheon was served to about 75 at the demonstration farm at Osborn. The visitors were very enthusiastic over the opportunities on the project and the general crop conditions.

Among the recent visitors to the Milk River project were Senators Walsh and Wheeler, of Montana; and S. G. Dawson, engineer, Dominion Water Power and Reclamation Service, who visited the St. Mary storage division; W. S. Wing, managing editor of Farm and Fireside, and Ralph Budd, president, L. C. Gilman, vice president, and E. C. Leedy, general agricultural development agent, of the Great Northern Railway.

Superintendent Stuver, of the Newlands project, and Roy W. Stoddard, attorney, spent several days in Washington, D. C., in connection with the preparation of a contract for turning over the operation and maintenance of the project to the water users.

Charles R. Wheeler, clerk on the Klamath project, has been transferred to the Denver office.

Officials of the California-Oregon Power Co. conferred recently with Superintendent Newell and Hydrographer Smith of the Klamath project in regard to the regulation of Upper Klamath Lake.

Dr. John A. Widtsoe, who was one of the principal speakers at the meeting of the Montana Irrigation and Drainage Institute, held at Valier, Mont., made a brief inspection of the Greenfields division of the Sun River project while traveling from Valier to Great Falls.

J. M. Hughes, land commissioner, and G. H. Plummer, western land agent of the Northern Pacific Railroad Co., visited the Kittitas office to confer with Walker R. Young, construction engineer, and F. A. Kern, secretary of the Kittitas reclamation district, regarding a plan of settlement of railroad lands near Cle Elum, and contracts for reservoir right of way.

George C. Kreutzer, Director of Reclamation Economics, spent several days on the Kittitas division of the Yakima project in connection with the development of a plan for the settlement of the Badger Pocket and Park Creek areas at the lower end of the division.

Ralph Nelson, foreman on the Shoshone project, has resigned to accept employment in a similar capacity with the contractor who is engaged in constructing the sewer system for Powell.

Senior Clerk August Lewin has been assigned temporarily to the Boise project in connection with repayment accounting.

Maurice G. Ricker, photographer and editor of motion-picture films, returned to the Washington office on August 30 after an extensive trip over a number of the projects during the course of which he took more than 1,000 still pictures and about 15,000 feet of motion pictures.

Miss Margaret A. Compton has been appointed junior clerk on the Rio Grande project and assigned to the position of stenographer to replace Mrs. J. Q. Swain, who has resigned.

Former Governor Thomas E. Campbell, recently chairman of the fact-finding commission, has been overseeing the technical details and historical data concerning the development of the Colorado River and reclamation work in connection with the filming of a new motion picture.

Huntley project corn has taken many prizes at fairs thoughout the country

Colorado River Development Compared with Australian Scheme

A recent issue of the Age, published in Melbourne and a leading newspaper in Australia, contains an interesting comparison of statistics relating to the proposed construction of the Boulder Canyon Dam on the Colorado River and the Hume Reservoir now being developed on the Murray River in Australia. The article is, in part, as follows:

Seven States are interested in the development of the scheme. Denver, in the famous Rocky Mountains, and Los Angeles, the "movies" city, must go to this river for additional water for household and industrial uses. A long tunnel through the Rockies will have to be constructed to supply Denver, and a 300-mile pipe line will be needed to carry the water to Los Angeles, which will be given jet water at 1,500 cubic feet a second. At present the river irrigates 2,000,000 acres of land which was once desert. It can be made to irrigate 6,000,000 acres, or one-ninth the area of Victoria. It now generates electric energy to illuminate a few towns, operate a few mines, and work small industries. It can be made to generate the collossal amount of energy of 6,000,000 electric horsepower. This compares with about 80,000 horsepower under the Yallourn scheme, which has cost about $45,000,000 to date, and 70,000 horsepower under the Tasmanian hydro-electric scheme, which has involved an expenditure of approximately $20,000,000. It is estimated that America will secure social and economic results that will mark the project as one of the greatest constructive achievements of the century.

Yakima Valley Breaks Fruit Shipment Record

During the week of August 15 to 21 all previous shipping records of the Yakima Valley, Wash., were broken with a grand total of 1,345 carloads of fruit. The former record was approximately 1,200 carloads made some years ago during an apple peak, according to the Yakima Republic.

Peaches led the record with 578 carloads, compared with 237 for last year during the same period. Mixed cars were second with 342. Pears required 242 cars. Other products comprised apricots, grapes, prunes, melons, potatoes, and apples.

The first work will be the construction across the channel of the river of a dam, which from its foundation to its crest will be over 700 feet high, and it will raise the water surface of the river 550 feet. Not only will it be the highest dam in the world, but will be more than twice as high as any dam ever built in any country. It will cost $40,000,000. The highest dam in existence now is the Arrowrock, in Idaho, built by the United States Reclamation Bureau, and it stands 349 feet high. The highest in any other country is the Camarasa Dam, in Spain, which is 335 feet high. The dam will create a reservoir to regulate the flow of the river. This reservoir will be 86 miles in length, and hold enough water to cover 26,000,000 acres of land a foot deep, or enough to cover almost half Victoria to that depth, or the American States of New Hampshire, Vermont, Massachusetts, Connecticut, New Jersey, and the District of Columbia. The average flow of the river for a year is 16,000,000 acre-feet; there are 272,000 gallons in an acre-foot. The weir will therefore hold the entire discharge of the river in 18 months. The great floods will be caught and held back until released as required for irrigation purposes. The water will flow over the dam.

It is interesting to compare this section of the scheme with what is being done in Australia. The Hume Reservoir, which is being jointly constructed on the Murray, above Albury, by the New South Wales and Victoria governments, is at present the second largest in the world. It will have a capacity of 2,000,000 acre-feet when completed in about five years' time. Originally it was intended to construct the section to contain 1,100,000 acre-feet, but the extension will now be made without any cessation of work. It will then have a surface area of 41,000 acre-feet, or nearly four times the area of Sydney Harbor, but thirteen times less than the Colorado weir. The length of the dam is 4,200 feet; the height of the dam 120 feet, with a base 92 feet wide and crest width of 32 feet. There is a concrete wall on the up side, supported by an earth embankment on the lower side. This foundation was put in to carry the extension. The cost of the scheme will be about $17,500,000. The Waranga Basin, one of the principal Victorian sources of water for irrigation, has a capacity of 333,000 acre-feet; while the Yan Yean Reservoir, from which a large section of Melbourne derives its household water, has a capacity of 26,000 acre-feet, so that the Colorado reservoir will be exactly 1,000 times larger. The largest reservoir in the world at present is the Elephant Butte, with 2,500,000 acre-feet, or only slightly larger than the Hume, which is next. Then comes the Assouan Dam, in Egypt, with 1,966,000 acre-feet; the Roosevelt Dam, in America, with 1,300,000 acre-feet, and the Burrinjuck Dam, in New South Wales, with 766,000 acre-feet.

Working to lift that mortgage

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1926

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Washington, D. C.

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George C. Kreutzer, Director of Reclamation Economics

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	Ottamar Hamele	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	A. R. McGinness	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.
Rio Grande	El Paso, Tex	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	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	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg	H. M. Schilling	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.
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.
Umatilla, McKay Dam.	McKay Dam, Oreg	R. M. Conner [6]	C. B. Funk	W. S. Gillogly	B. E. Stoutemyer	Portland, Oreg.
Kittitas	Ellensburg, Wash	Walker R. Young [6]	E. R. Mills		do	Do.
Sun River, Gibson Dam.	Augusta, Mont	Ralph Lowry [6]			E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite near Fruto, Calif.	H. J. Gault [6]			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	
Owyhee	Boise, Idaho	R. J. Newell	
Vale	do	do	
Payette division, Boise	do	do	
Gooding	Jerome, Idaho	B. E. Hayden	
Middle Rio Grande	Denver, Colo	I. E. Houk	Middle Rio Grande conservancy district.
Salt Lake Basin	Salt Lake City, Utah	W. M. Green	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	Washington, D. C	Geo. C. Kreutzer	

The NEW RECLAMATION ERA is sent monthly to all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others 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.

EXHIBITS

OF

CROPS GROWN ON IRRIGATION PROJECTS

OF THE BUREAU OF RECLAMATION

DEPARTMENT

OF THE

INTERIOR

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NEW RECLAMATION ERA

VOL. 17 NOVEMBER, 1926 NO. 11

A FEW OF THE HOLIDAY BIRDS GROWN BY THE THOUSANDS ON THE IRRIGATION PROJECTS

Thanksgiving

IN no other nation of the earth is there a holiday—or holy day, as it should properly be written—corresponding to the American Thanksgiving. And in no other nation does there exist the same bountiful reason why this nation should set aside a special day for humble thanks and grateful appreciation for the blessings bestowed upon it and its peoples by Almighty God, the Creator and Giver of all things. Steadily, since the first Thanksgiving Day, more than three hundred years ago when the Pilgrims landed on Plymouth Rock, has the greatness of America, materially and morally, advanced until she stands to-day foremost of all nations in the securement of happiness, peace, and prosperity to her citizenry. It is fitting, then, that all should join in the spirit of this day, which should, and does, include, among the reverent and thoughtful, a prayer that God in His infinite goodness and mercy will grant a larger share of His bounty to His less fortunate children wherever they may be situated until the fulfillment of the prophecy of peace, contentment, good will, and brotherhood rests upon all the earth.

HUBERT WORK,
Secretary of the Interior.

1926

NEW RECLAMATION ERA

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HUBERT WORK
Secretary of the Interior

ELWOOD MEAD
Commissioner, Bureau of Reclamation

Vol. 17 NOVEMBER, 1926 No. 11

Interesting High Lights on the Reclamation Projects

THE Shoshone project held an election October 2 to vote on the contract between the United States and the Shoshone Irrigation District, providing for transfer of management of the irrigation works of the Garland division and for repayment of construction costs upon a crop production basis. The returns showed 410, representing a total area of 30,957.16 acres and an irrigable area of 25,718.6 acres, in favor of the contract and 8, representing a total area of 397.92 acres and an irrigable area of 378.51 acres, against the contract.

AT American Falls Dam, all concrete work was completed at the end of September except 800 cubic yards in one panel of the left abutment section, the parapet walls, and a small amount on the radial gate piers. The earth fill in the right embankment was completed and a considerable amount of material was placed in the left embankment.

THE Great Northern Railway, through its colonization agency, has obtained options on several tracts of land on the Milk River project at very reasonable prices and terms.

VERY satisfactory results are reported from the potato crop on the Milk River project, with high yields and good prices. The sugar beet crop will average more than 10 tons an acre. Indications point to very profitable returns on all crops from the irrigated lands of the project.

INQUIRIES for Belle Fourche project land have been numerous recently. There has been a marked increase of new people on the project and it is expected that 1927 will see much improvement. Listing of land on the standard option form continued, and at the end of September a total of 5,100 acres had been listed.

DURING September there was a labor shortage on the Carlsbad project for all work except cotton picking. At the close of the month about 2,000 bales of good grade had been picked, the yield averaging about three-fourths of a bale per acre.

ON the Riverton project one applicant who had previously appeared before the Examining Board was accepted and assigned a farm unit. Another applicant made application and appeared before the board.

AUTHORITY has been granted for the award of the contract for the construction of Stony Gorge Dam, Orland project, to the Ambursen Dam Co., at a total cost of $518,904.

THE yield of almonds on the Orland project will exceed that for any year in the history of the project. Eighteen carloads have already been shipped with a few carloads still remaining on the project for later shipment.

MOST of the late varieties of potatoes grown on the Uncompahgre project are being held in storage in anticipation of higher prices. It is predicted that $3 spuds will prevail during November.

POTATOES were the principal crop shipped from the Minidoka project during September, with a total of 258 cars from project towns. A large proportion of the crop will be placed in storage for higher prices.

MORTGAGE loan companies report the sale of several farms to settlers on the Minidoka project, and the general financial condition shows substantial improvement over that of last year.

MANY sugar-beet fields on the Belle Fourche project give promise of well over 20 tons per acre. Cucumbers for pickles also made an excellent showing, a number of farmers receiving returns of $200 to $300 per acre. The Nisland pickle station received 15,000 bushels for the season.

OWING to the high price of potatoes during the fore part of September, this crop on the Shoshone project was moving to market much more rapidly than in ordinary seasons. During the month 225 cars were shipped from the project.

THE Powell Creamery purchased 11,000 pounds of butterfat during the month, and manufactured 13,300 pounds of butter and 260 gallons of ice cream. Other agencies purchased 2,400 pounds of butterfat for shipment to the creamery at Butte, Mont. About 6,000 pounds of cream were shipped from the Frannie division.

THE Lower Yellowstone project reports that probably the best all-round crop ever produced in the valley has been harvested from the irrigated land this year, particularly with reference to alfalfa and sugar beets. The yield of beets will average about 12 tons an acre.

GOOD progress is being made on the construction of the first four miles of the main canal on the Kittitas division of the Yakima project. The report of the appraisal board on land classification and appraisal has been completed.

THE sugar beet harvest on the North Platte project started late in September and at the end of the month four factories were slicing beets. The two new factories at Minitare and Torrington began slicing about the middle of October.

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President Coolidge Approves Owyhee Project Construction

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 October 12, 1926, approved the construction of the Owyhee irrigation project in Oregon and Idaho, as submitted to him in the following letter from the Secretary of the Interior.

THE SECRETARY OF THE INTERIOR,
Washington, D. C., October 9, 1926.

The PRESIDENT,
The White House.

MY DEAR MR. PRESIDENT: 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 adapatable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.

The various features 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.—Owyhee River. Has a mean annual flow of 1,004,000 acre-feet, the maximum yearly flow being 2,300,000 acre-feet and minimum 350,000 acre-feet. Small summer flow fully used by Owyhee ditch which requires supplemental water. Future depletion by upstream developments amounting to 30,000 acre-feet annually allowed for. Project requirements, 636,000 acre-feet annually, including Owyhee ditch lands.

Shortages in period of 21 years, 54 per cent, 1924; 16 per cent, 1915; 11 per cent, 1905.

The shortages referred to above are based on the assumption that the maximum acreage will be irrigated, and may be eliminated by decrease of acreage. If there is no increase of acreage, it would be possible to increase the water supply by raising the height of the dam a few feet and increasing the carry-over capacity, which could be done at slightly greater expense.

Storage capacity.—Dead storage for diversion elevation, 406,000 acre-feet; live storage, 595,000 acre-feet at Hole-in-Ground Reservoir site.

ENGINEERING FEATURES

Storage-diversion dam.—Concrete arch 355 feet high above foundation, 600 feet long on top, 405,000 cubic yards concrete, channel spillway with 30,000 second-feet capacity.

Main canals.—Outlet from reservoir is 15 feet diameter, tunnel 3½ miles long to division works. Succor Creek branch to supply Gem district and adjacent lands has tunnel 4½ miles long, 10.2 feet diameter, followed by 60 miles of canal principally in earth. From division works the main canal continues 4 miles, including 1,500 feet of tunnel, 8,000 feet of concrete flume, and a 900-foot steel siphon 114 inches in diameter. From the end of the main canal Mitchell Butte Canal, with maximum capacity of 1,203 second-feet, crosses Owyhee River with siphon 9 feet diameter, 1,730 feet long, and continues 60 miles northerly largely in earth to Malheur River. From end of Mitchell Butte Canal, Dead Ox Flat Canal crosses Malheur River with 8-foot diameter steel siphon 2½ miles long, capacity 445 second-feet, thence northerly 35 miles in earth canal to the end opposite the town of Weiser, Idaho.

Drainage.—A total of $993,000 is included in the construction estimate for drainage in all divisions.

COST OF CONSTRUCTION, BY FEATURES

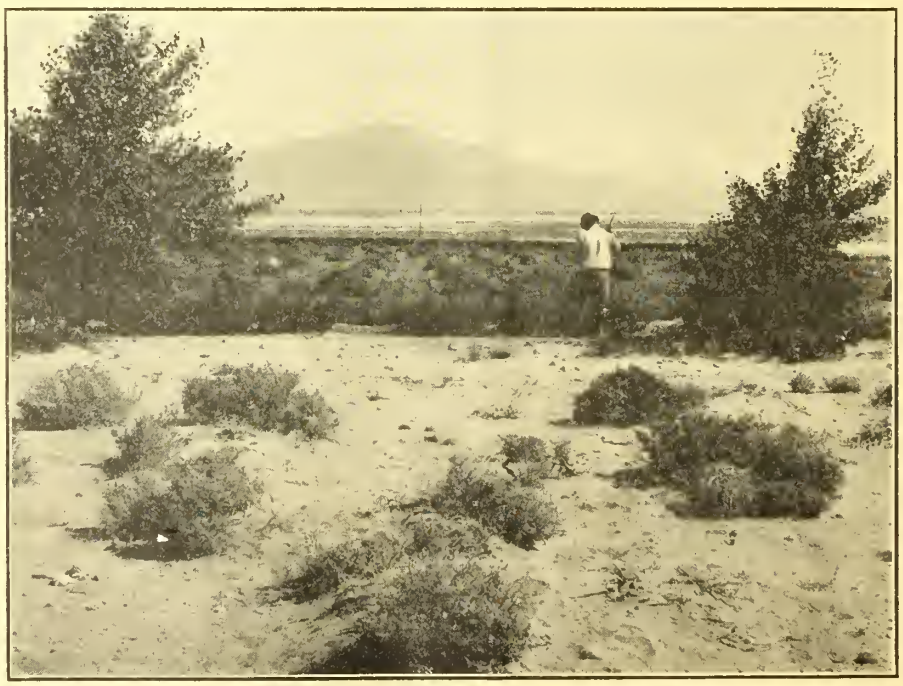
Storage and diversion	$6, 111, 815
Main canals	9, 506, 785
Laterals	1, 103, 400
Drainage	993, 000
Total	17, 715, 000

TOTAL COST

As shown above, the total cost of $17,715,000 is for actual construction only, and does not include items for "Operation and maintenance during construction," "Land surveys," and "Investigations." An allowance of $285,000 has been made to cover the cost of the above items, bringing the gross cost to $18,000,000.

LAND PRICES AND PROBABLE COST OF DEVELOPMENT

The Owyhee project comprises about 124,000 acres of irrigable land in the States of Idaho and Oregon. Of this about 70,000 acres are new land covered



The transformation of the desert

with sagebrush and other desert plants, but are not farmed because of the low rainfall. Some 41,000 acres are in districts irrigated from the Snake River by means of pumps, and 13,000 acres are under the Owyhee ditch, which has an insufficient water supply. Fifty-four thousand acres, or more than one-third of the land in the project, is therefore settled, improved, and is now being irrigated.

The unsettled, unimproved, excess lands of this project have been appraised by a competent board which has fixed an average selling price of $7.42 an acre for all lands of the project and an average of $10.20 an acre for the irrigable portion thereof. The contracts with the districts and individual landowners require that these prices be adhered to in selling excess land to new settlers. Settlers who are allotted public land will be required to have some capital and farming experience. Application of these principles in settling this project will tend to eliminate some of the obstacles to farm development of the past.

FINDING REGARDING FEASIBILITY OF PROJECT

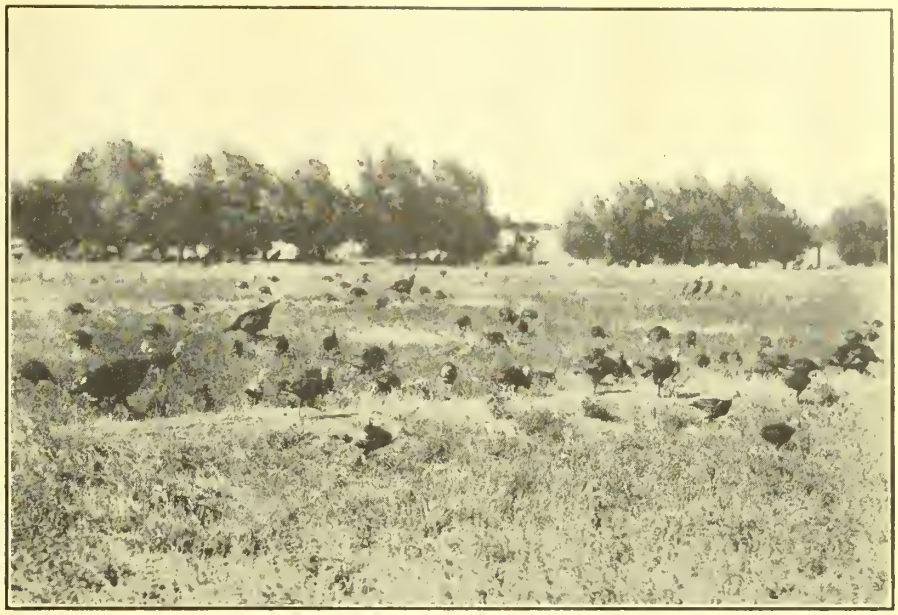
The foregoing data justify the conclusion that the project is feasible from an engineering and economic standpoint, and I accordingly so find and declare.

ADAPTABILITY OF LAND TO SETTLEMENT AND FARM HOMES

The land embraced in the project is of more than average fertility. Rough land and poor soil have been eliminated. The retained land can be prepared for the effective application of water. If properly prepared for irrigation and properly cultivated, good yields of all crops grown in this locality are assured. With care in the selection of settlers, with farms suitably improved and equipped, success in farming may be anticipated.

PROBABLE RETURN TO RECLAMATION FUND OF COST OF CONSTRUCTION

The next declaration required is that the cost of construction will probably be returned to the reclamation fund. This is interpreted to mean that it will be returned within the period fixed in the contract with the Owyhee district, which is in 40 years from the time the public notice that the works are completed is issued by the Secretary. The works can be completed in five years from June 30, 1927, if Congress will appropriate the necessary money. If completed in 1932, public notice could be issued which would require payments to begin in 1933, and this would give irrigators until 1973 to complete their payments.



Turkeys on an Orland homestead

The construction costs of this project will vary with the classification of the land, but the average will probably be about $160 an acre, making the average yearly payment $4 an acre. To this will have to be added the expense of operation and maintenance, and the question which we have to consider is, Can irrigators meet this operation cost and an annual construction payment, varying between $3 and $6 an acre, depending on the class in which a particular farm is placed?

While this is a higher construction payment than has been made on older projects like Boise, Minidoka, Strawberry Valley, and North Platte, where conditions of soil and climate approximate those at Owyhee, the total yearly charge will be considerably less than is now being paid by irrigators under the pumping units of this project or on many other private projects. It is believed, therefore, that improvements in methods of development and in agricultural practices which may be expected will increase incomes and ability to meet the required payments on the Owyhee project.

The unwise and immensely injurious effect of land speculation on older projects will be forestalled at Owyhee by the appraisal made of the surplus land and fixing in advance the price settlers are to pay. Provision for giving settlers practical advice for working out crop programs and for the selection of settlers on the public land of the project, all of which are now authorized by law, will help hasten farm development and increase the earnings of farmers.

Settlers on this project will begin the development of farms under the following favorable conditions: Increase in agricultural production in the Nation is not keeping pace with increase in population. They will realize at the outset that their farms must be intensively cultivated and will be helped to organize for cooperation in production and marketing.

The favorable conditions heretofore recited and the newly established policy of the bureau justify the belief that this project will return the cost thereof.

Because of the urgent need for a larger and cheaper water supply by the settlers on 54,000 acres of this area, because the unimproved land is fertile, suited to the needs of settlers and appropriate for development under the reclamation law, and because the development of this area is destined to greatly benefit the Nation, I recommend its approval and the issuance of the necessary authority to this department to make contracts for its construction and to proceed with the work.

Very truly yours,

HUBERT WORK.

Approved October 12, 1926.

CALVIN COOLIDGE,
President.

Irrigation is no modern discovery. All that we have learned to do in this latter day is to place our modern civilization safely under the irrigation ditch.

Much experimentation is yet needed before we understand properly and fully the relationships existing among water, soils, and crops.

The real test of success depends upon the ability of the man under the ditch, through a long succession of years, to win from the soil and the water a comfortable and satisfactory living for himself and his family and to pay his obligations.

Reclamation Project Women and Their Interests

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

Help Yourself and Posterity—Plant Shade Trees

An example of the protection given by shade trees

DID the October issue of the ERA start you thinking about beautifying your homestead by planting more shade trees?

I have a treat in store for you. Dr. F. L. Mulford, horticulturist in charge, of the Bureau of Plant Industry, promises to furnish an article on this subject for an early issue of your magazine. I hope you will all watch for it and write in your reaction.

The saying "There is no aid to success like appreciation" applies with double strength to our efforts in trying to make the NEW RECLAMATION ERA as attractive as possible to our water users on the projects.

Fall and the Problems it Brings

The children have returned to school, harvesting is in process, and the housewife's thoughts naturally turn to preserving and setting her house in order for the long winter months.

The following can be made economically and will often fill a need when the crops are out of the ground and you have to resort to your pantry:

CORN SAUCE

3 dozen ears of corn.	½ cup of salt.
3 red peppers.	½ pint cider vinegar.
3 green peppers.	1½ pounds sugar.
1 large head cabbage.	

Cut fine and cook until tender. For dressing use the following ingredients:

3 pints vinegar.	4 tablespoons ground mustard.
5 tablespoons cornstarch.	
1 cup sugar.	1 tablespoon tumeric.

Bring vinegar to boil, then mix cornstarch, sugar, tumeric, ground mustard with a little cold vinegar or water. If vinegar is very strong use half of each, stir into the boiling vinegar until it thickens, then put in vegetables; let stand over fire until thoroughly heated through; then put in jars and make air-tight.

PEPPER AND ONION RELISH

6 onions.	½ cup parsley leaves.
6 red peppers.	1 cup sugar.
6 green peppers.	2 spoonfuls salt.
2 cups of vinegar.	

Peel onions; cut peppers in halves and remove seeds. Chop the onions and peppers fine and a half a cup of parsley leaves. Cover the whole with boiling water, set a plate above and let stand 5 minutes. Drain and add sugar, salt and vinegar. Let boil half an hour and seal in small jars.

DILL PICKLES

Wash pickles off. Make brine of salt and water strong enough to float an egg. Lay one layer of grape-vine leaves at the bottom of the crock. Then put two layers of pickles and one layer of dill, two layers of pickles, etc., until the crock is filled and then put grape leaves on top, then a board and stone. Pour liquor over whole contents and let stand for three weeks, until pickles change color.

INDIA RELISH

½ peck green tomatoes.	2 green peppers.
Small head cabbage.	4 cups sugar.
1½ quarts vinegar.	1 tablespoon each mustard seed, celery seed, cinnamon, and cloves.
3 large onions.	
3 red peppers.	

Chop tomatoes, sprinkle a little salt over them and let staud overnight; drain liquor off, then add cabbage chopped fine. Boil all in vinegar for one hour, then add onions and peppers chopped fine, sugar, and spices. Boil until tender, then put in glass jars well sealed.

GREEN-TOMATO CHOWCHOW

1 peck green tomatoes.	1 cup grated horse-radish.
8 green peppers.	1 tablespoon ground cloves.
4 onions.	1 tablespoon ground cinnamon.
1 cup brown sugar.	
1 cup salt.	

Chop tomatoes, peppers, and onions fine. To this add salt and let stand overnight, after which drain off the water and then add horse-radish and sugar, cloves, and cinnamou. Fill till it stands full with cold vinegar and let it cook gently all day. When done put in jars and seal.

If house cleaning is carefully planned and approached systematically, much of the usual inconvenience and discomfiture of the entire household may be eliminated. Doing away with superfluous shelves and moldings, filling up cracks and crevices in which dirt lodges, and arranging adequate storage space will help.

To accomplish the best results suitable cleaning tools and materials must be at the housewife's disposal. The ideal arrangement is to have a complete set stored in orderly fashion in a convenient, well-ventilated closet. Whether few or many kinds are needed, it is economical to buy well-made, durable tools and keep them in good condition and grouped together if possible. (See illustration on opposite page.)

The initial cost of implements of good quality may be a trifle greater than those of poorer grade, but substantial ones generally give longer and better service and are more economical in the end. A few well-chosen implements require less care than a large collection bought haphazard.

TOOLS

The following list gives some of the desirable cleaning tools for farm homes where the luxury of a vacuum cleaner is not enjoyed:

Brooms and brushes.—Corn broom for carpets and rough surfaces, such as concrete, brick, and stone.

Soft-hair brush for smooth floors and floor coverings, such as wood, tile, linoleum, oilcloth, and cork carpeting.

Wall brush of lamb's wool, or loops of soft cotton twine, or soft bristles. A bag of cotton flannel slipped over the broom may take the place of a wall brush.

Whisk broom for general use.

Scrub brushes of various sizes for cleaning unfinished wood, sinks, etc. A long-handled one will be found especially convenient for floors.

Paint brushes or special brushes of various shapes and sizes for upholstery, reed furniture, and carved surfaces.

Radiator brush for cleaning between pipes.

Refrigerator brush, with flexible wire handle, for cleaning drainpipe.

Mops.—Wet mop for floors that are to be washed with water. A convenient form has soft, loosely woven cloth fastened to the handle by a flat metal clasp. A mop wringer fastened to a pail saves the worker much stooping, keeps the hands from the water, and removes more water from the cloth than would be possible by hand wringing.

Dry mop either untreated or oiled. The latter holds the dust better and renews the finish on painted, varnished, or shellacked floors, but should not be used on waxed surfaces.

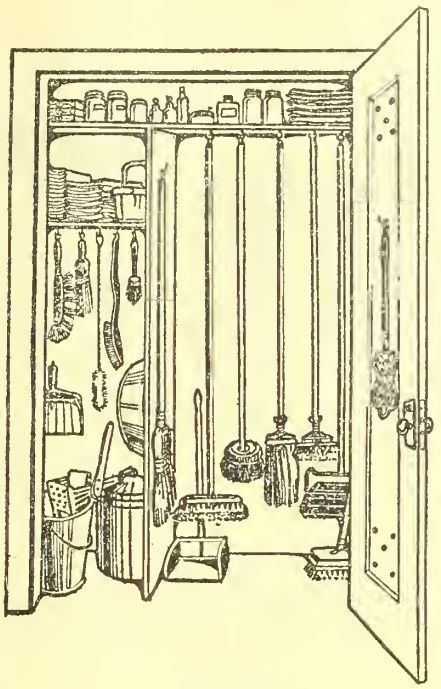
Dustpan.—The edge should be firm and should come in direct contact with the floor, and the side to which the handle is attached should be high enough and so shaped as to prevent dirt from falling out. A long-handled dustpan does away with some stooping.

Dusters.—A duster should be soft and should shed neither lint nor ravelings; it holds the dust better if dampened or oiled. Silk and chamois are excellent for use on highly polished surfaces. A duster may be moistened by passing it through steam; by wetting one corner of the cloth, rolling it up, and letting it stand for a short time; or by wringing together one dry cloth and one that has been wrung out of water. A dust cloth may be oiled by applying a few drops of kerosene or light lubricating oil on one corner, rolling the cloth and letting it stand until the oil has spread evenly. Cotton waste and paper are good substitutes for dust cloths in cleaning dirty, greasy surfaces. Feather dusters should not be used, except perhaps just before sweeping, for they scatter but do not remove dirt.

Carpet sweepers.—Many good kinds of carpet sweepers are on the market and are effective for taking up surface dirt. They are particularly useful for the daily care of rugs and carpets.

Carpet beaters.—These may be of wire or of either flat or round reed. Those of flat reed are least hard on the carpet fibers.

Pails or buckets.—Galvanized iron or fiber pails are light in weight and durable; the former are cheaper.



MATERIALS

Besides these tools and a liberal supply of paper and cloths, various materials are used to loosen the dirt and make it easier to remove. All these cleaning materials or agents should be used sparingly. This is not only economical of the cleaners but less likely to injure the surfaces cleaned. Some of those most commonly used are listed below.

Water.—Hot water loosens dirt more easily, but it is more likely to injure finishes and fabrics than lukewarm or cold water. Water should not be allowed to stand on floors or woodwork nor to get into cracks or seams; it should, in fact, be used very sparingly and in most cases wiped off at once.

An abundant supply of water piped through the house and a good drainage system for carrying away waste are of first importance in making housecleaning easier, as well as for the health and general comfort of the household.

Soap.—A mild soap—that is, one with no free alkali—is less likely to injure finishings and colors than a stronger one. A soap solution makes suds more quickly and cleans more evenly and safely than soap in cake; a quantity may be made at a time, and bits of soap may be used up in this way.

One pound of soap and 3 quarts of water are heated slowly until the soap is dissolved and then the solution is placed in broad-mouthed bottles or jars, for use as needed. Flaked and chipped soaps dissolve more quickly than cake soap. Several kinds are now on the market, and hard cake soap may be chipped at home by being rubbed over a grater.

Soap may be made at home from lye and waste fat, and the directions given on the lye container will generally be found satisfactory. Home-made soaps, however, are likely to contain free alkali and should be used with caution, especially on delicate and colored fabrics, and on paint, varnish, or other finishes.

Ammonia, borax, and sal soda (washing soda).—These alkalies are used both to soften hard water and to loosen dirt. Concentrated ammonia bought at a drug store and diluted at home by using about 1 part ammonia to 7 parts water is usually more economical and satisfactory for general cleaning than the dilute form sold as household ammonia. Borax is least likely to injure delicate fabrics, but is the most expensive of these three alkalies. Washing soda is bought in coarse powder form and should be thoroughly dissolved in water before using.

Gasoline and benzine.—These are used to dissolve grease and sometimes to control insects; they are so inflammable and explosive that the fire laws of many States allow only very small quantities to be kept in a house. When either of them is used in cleaning, it should be put in a small bottle and kept well corked, except when the liquid is actually being poured out.

The bottle should not be opened in a room in which there is a fire or a gas, oil, or candle flame, or in bright sunshine. Only a little liquid should be poured out at one time.

Kerosene.—This is used to cut grease and loosen dirt, and sometimes to repel insects.

Oils.—Various kinds of oils are used to renew the finish on shellacked, varnished, and oiled surfaces. Cloths moistened with linseed oil are especially liable to spontaneous combustion and should be either destroyed immediately after use or kept in a tightly covered fire-proof container. Light mineral oils, such as are used for lubricating motors, are less dangerous in this respect and are also cheaper than linseed oil. They may be diluted with eight or ten times their volume of kerosene or gasoline. When the latter is used the mixture is, of course, highly inflammable and must be treated as carefully as pure gasoline.

Turpentine.—This is used to dissolve paint, varnish, and wax. It is inflammable and should not be brought near a flame.

Steel wool.—This consists of hair-like particles of steel. It is used in scouring certain metals and in removing varnish and paint. Different grades are numbered according to fineness, 00 being the finest. In using it the hands should be protected by old gloves or mittens.

Furniture polish.—This is convenient for rubbing up various kinds of woodwork. The United States Bureau of Standards recommends a simple kind, made by mixing 1 part raw linseed oil with 2 parts turpentine and adding a little melted beeswax if desired. Or a light mineral oil diluted with kerosene or gasoline may be used for this purpose.

Floor wax.—This is used for giving a polished surface to wood floors. It should be applied in thin coats and well rubbed. It may be bought ready mixed or made at home, as follows:

1. Mix 1 pint of turpentine and 4 ounces beeswax and heat in a vessel set over hot water until the wax is melted. Remove from the heat. Add 3 ounces aqua ammonia (strength 10 per cent) and about 1 pint of water and stir vigorously until the mass is creamy.

2. In a vessel set in hot water melt one-fourth pound beeswax and 1 pound paraffin. Add one-fourth-pint raw linseed oil and 1¼-pints turpentine and stir the mixture vigorously.

In making both these polishes great care must be taken to heat them only by setting in hot water and to have no open flame in the room for turpentine is very inflammable.

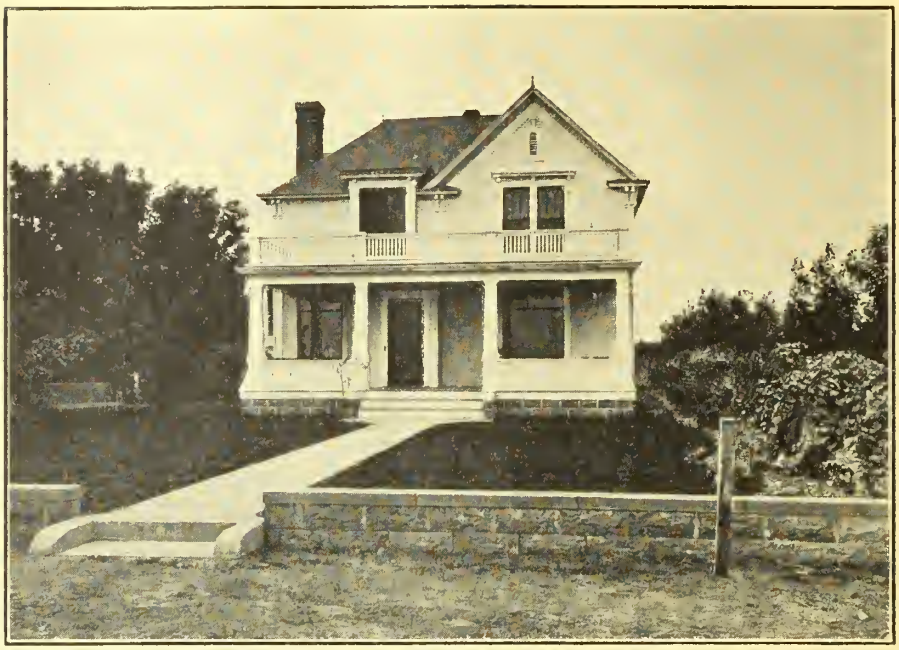
IMPROVEMENTS

With the fall house cleaning completed let us consider the addition of one or more timesavers we have been thinking about during the year. This might be a storage closet for linens, a specially equipped corner for cleaning utensils, an additional convenient table in the kitchen, etc. You can not appreciate the helpfulness of these until you have worked with them, and the effort made in installing one or the other of these conveniences is more than repaid by the steps and time they save you during the year.

"Better community" meetings fostered by women's clubs are an established institution on a number of the projects.

To keep yolk of egg fresh, if only the white is needed, cover the yolk gently with a little cold water so as not to break it. It will keep fresh for several days.

The need for strong cooperative marketing associations can not be overemphasized. They are absolutely necessary to bring about efficient and economical marketing and standardization of crops, but the movement should be truly cooperative and should be controlled by its membership.



Reclamation of arid lands doesn't only mean good crops. It means good houses as well

Regulations for Taking Crop and Livestock Census

On Federal reclamation projects for year ending December 31, 1926

THE crop and livestock census for the year 1926 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 direction of the manager or superintendent of the association or district. The methods employed will be similar to those followed in 1925, 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 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 the manager or superintendent of the water users' association or irrigation district shall be the supervisor of the census. The project superintendent, 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.

INSTRUCTION FURNISHED

In order that uniform methods shall prevail and accurate results be obtained, the Bureau of Reclamation will detail temporarily one of its employees experienced in crop-census methods and procedure to visit each project which has been taken over by the water users and as to which the contract between the United States and the water users, with respect to the project provides for repayment of the construction cost on the basis of the average gross annual acre income as provided by the said act of December 5, 1924. This employee will confer with the water users' association or irrigation district and explain fully to the supervisor of the census and the enumerators the method of taking and compiling the crop census and assist the supervisor in arriving at correct values to be applied to the various crops.

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.

Project Chief Clerk Prize Winner at Fair

E. R. Scheppelmann, chief clerk of the Lower Yellowstone project, is also a gardener, as will be shown from the following record of prizes taken by his garden products at the Richland County Fair, Montana:

First prize.—Tomatoes, carrots, celery, and turnips.

Second prize.—Cucumbers (lemon), parsnips, parsley, summer squash, onions (white), and Swiss chard.

Third prize.—String beans, cabbage, and strawberries.

Klamath County Fair Reflects Improvement

The 1926 Klamath County Fair was held September 16 to 18 and indicated improved agricultural conditions along many lines. The dairy show was 100 per cent greater than any previous dairy exhibit, totaling 145 head, of which 92 were Holsteins, an increase of 300 per cent over any previous Holstein exhibit.

Aberdeen Angus, Herefords, and Shorthorns were shown in the beef division. Entries of sheep and hogs were double those shown last year and the quality was better. Poultry showed a slight increase and rabbits an increase of about 800 per cent. The rabbit show numbered 110 entries and was adjudged one of the best in southern Oregon.

The variety of general farm produce was somewhat greater owing to the growing of considerable corn, watermelons, and other produce not grown each year. From the corn shown it is believed that this will be an annual crop when once it is established.

The four community booths were much better than in any previous year. First prize went to Langell Valley, second to the Central Community Club, third to Bonanza, and fourth to Malin. Club work, domestic science, art, culinary, and flowers were all particularly good and up to the standards of former fairs.

Employee's garden on Lower Yellowstone project

Van Ryneveld's Pass Irrigation Scheme, South Africa

A planned irrigation development which will be watched with interest by other countries—Capital requirements for a 30-acre farm unit range from $7,500 to $10,000—Settlers aided and directed in early years

AN interesting irrigation project was completed recently in Cape Province, South Africa, near the city of Graaf Reinet. This project, known as the Van Ryneveld's Pass irrigation scheme, was initiated in 1919 and constructed under the supervision of the South African irrigation department. Construction began in July, 1921, and is practically completed at this time. It includes a storage reservoir of 64,000 acre-feet capacity on the Sunday River, about 1 mile northwest of the town of Graaf Reinet.

A series of pickup weirs down the river divert the flow into a number of canals and cover an irrigable area of from 8,400 to 10,000 morgen of very fertile soil. (One morgen equals 2⅛ acres.)

The following data will give a fair idea of the reservoir and dam:

Catchment area, 1,477 square miles.

Length of dam at the crest, 1,250 feet.

Crest width (over all), 10 feet.

Footway, 7¼ feet.

Batter-face, vertical.

Batter-rear, 0.5 to 1 and 0.65 to 1.

Top of parapet wall, 2,597.75 feet above mean sea level.

Road level, 2,593.25 feet above mean sea level.

High-flood level, 2,590 feet above mean sea level.

Full-supply level, 2,584 feet above mean sea level.

Lowest foundation level, 2,441 feet above mean sea level.

Outlet level, 2,510 feet above mean sea level.

River-bed level, 2,484 feet above mean sea level.

Gross capacity of full-supply level, 64,000 acre feet, i. e., 17,424,000,000 gallons.

Water-surface area at high-flood level, 3,408 acres.

Water-surface area at full-supply level, 2,800 acres.

Quantity of concrete in main wall, 135,058 cubic yards.

The major distributing system embraces 60 miles of canal including some 200 major concrete structures, such as weirs, causeways, flumes, bridges, drops, regulators, and distributary outlets. The estimated cost was $2,250,000, but it is expected that the final cost will come well within $2,000,000.

The funds required for the construction of the major features of the irrigation system were voted by the Union Parliament and are repayable in 40 equal annual installments with 5 per cent interest, payment commencing 2 years after the official date of the completion of the works. In this case these construction costs amount to about $100 per acre. The annual construction charges payable to the Government and to the Schlesinger Co. amount to approximately 28 shillings (about $7 per acre) and the operation and maintenance charges for the major system about 3½ shillings per acre, making a total of about $7.90 per acre per annum.

The settlement feature appears to be largely in the hands of the Schlesinger Co. (of New York) who purchased about 95 per cent of the land. This company has undertaken the building of the roads and of all the subsidiary canals and laterals necessary to bring the water to the settlers' land. The essential features of the settlement scheme are outlined by the secretary of the Schlesinger Co. (incorporated as the African Irrigated Land Co. Ltd.) in a letter to one of the members of the district irrigation board as follows:

Price of irrigable, land £45 per acre.

Price of nonirrigable land, £2 10s. per acre.

Price of small building plots adjoining settlers irrigable land, £12 10s per acre.

Price of small building plots not adjoining settlers irrigable land, £6 5s. per acre.

Training, free, for 12 months. Thereafter settlers will be advised and instructed for some years while working their own holdings.

Boarding fees (including laundry and medical attendance), £6 5s. per month, much less than cost.

Purchasers are entitled within three months to exchange their first holdings for others of equal value which they like better.

Size of holding recommended, 30 acres irrigable land. Dry land according to special requirements.

Ground is sold cleared and ready for plowing. All development work, maintenance of orchards, growing of lucerne and other crops, erecting of fences, etc., is done at cost price plus 10 per cent, the latter being intended to cover cost of supervision and administration, and not as a profit in the ordinary sense. Settlers may of course make their own arrangements instead of using the company's contract department.

Subsidiary canals are constructed by the company, bringing the water to the settler's ground.

Estimate of capital required to put a man on his feet—that is, to get his 30 acres planted, house built, animals purchased, to maintain him for two years, and to put everything into running order, £1,500 to £2,000. (Some men could make good with much less, but we do not accept settlers with less, unless in very exceptional circumstances.)

In addition to outright purchasers we also have option holders, who hitherto have been entitled to train for six months free, the same as purchasers, and then purchase or not as they thought well. The six months' period is now about to be reduced to one month.

Houses are not built for settlers but the company sells them bricks at a cheap rate (present price 30s. 9d. per 1,000 good burnt bricks) and they are entitled to the services of the company's builder as far as plans, estimates, advice, and a certain amount of supervision of their building are concerned.

As soon as sufficient pigs are raised by settlers a bacon factory will be established by the company. Similarly, a creamery will be established in due course, and both these concerns handed over to the settlers.

Settlers will be assisted to form a cooperative society for the purchase of their stores and marketing of their produce. Export facilities will be provided. These are not nebulous promises but definite undertakings.

It is well to observe that the capital requirements for a 30-acre unit are given as ranging from $7,500 to $10,000. This agrees fairly well with the results of the similar economic studies made by the Reclamation Bureau on new or proposed projects, considering the greater initial outlay and the greater demands made on the settler during the early years of settlement. This is a further illustration of the fact that the traditional pioneer system of settling irrigation projects, of starting with little or no financial or equivalent preparedness is a thing of the past. It is safe to say that even with the fulfillment of these demands the successful progress and outcome of the scheme will depend much upon the business sagacity, the leadership, and the intelligent cooperation of all affected interests which the projectors of this settlement scheme may be able to bring about and to maintain throughout the first decade or more.

The experience of our neighbors in this undertaking will be viewed with fraternal interest, realizing that principles and methods, which may prove successful in one locality are likely to produce favorable results here if applied with such modifications as conditions and good judgment may impose.

Great opportunity exists for the cutting down of the cost of farm operations through the reduction in the labor requirements of each operation and by a better application of the power used.

Boys' and Girls' Club Work

Genola District, Strawberry Valley Project, Utah

AN interesting and unusual story of achievement in boys' and girls' club work in the little community of Genola under the Strawberry Valley project, Utah, and what this club work has done to develop and sustain an optimistic spirit in the district was disclosed at the recent "Achievement Day Celebration" of the Fourth Annual Community Fair held on September 18 at the Genola School House.

This community is believed to be the only one in Utah with a 100 per cent enrollment in boys' and girls' club work. At the start of this year, the second in club work, there were 68 boys and girls enrolled. During the year 4 moved away from the community, but the remaining 64 have carried on 72 projects to completion. There are six clubs in the community, three in which the boys specialized in general farm crops, one for those interested in livestock, and two for the girls to learn the science of sewing and cooking.

During the present year, the clubs have held monthly meetings and each has brought to Genola some outside speaker to give them pointers upon club work. Supplementing these club-work programs, were entertainment numbers provided by the members. The effect of these programs has been to build up a strong community spirit. The parents became interested in the programs and so became as regular in their attendance as the members and as equally interested in the success of the numerous projects under way.

CLUB INTRODUCES SPANISH ONIONS

It is not frequent that one hears of junior club organizations of this kind being instrumental in the introduction of a new industry, but the Genola organization has this distinction. The club members were the first to raise the sweet Spanish onion on a commercial scale. Since their experiment with this product others have adopted it with pleasing success. The efforts of the club workers were also, in a large degree, responsible for the Utah Packing Corporation extending its territory to include Genola. During the last two years canning crops have been given special attention in club programs and next spring string beans for canning will be added to the list. The club workers were also largely responsible for the Genola community exhibit at the county fair.

SELF-FINANCED

As the record of this community of club workers has been unusual in achievement, so has it been unusual in the way it was financed. The club members have financed themselves ever since it began. In addition to this, considerable has been saved from the sale of crops to constitute a fund sufficiently large to insure cash awards to the winning club exhibitors at the local community fair. The clubs at Genola never have asked a dollar donation. It is this record of which the club is particularly proud.

Last year the club members realized approximately $3,200 from the sale of their products. This meant an average return of $142 per acre and $145 for each club member.

This year is the first for the girls' clubs. These new units will be important factors in next year's "Achievement Day Celebration."

Mr. Cecil Nelson is director of all club activities and Mr. E. P. Price is the county agricultural agent.

Power and labor together account for approximately 60 per cent of the total cost of farming; and a better knowledge of the power requirements of farm operations and the adoption of more efficient types of power units will do much to cut down production costs.

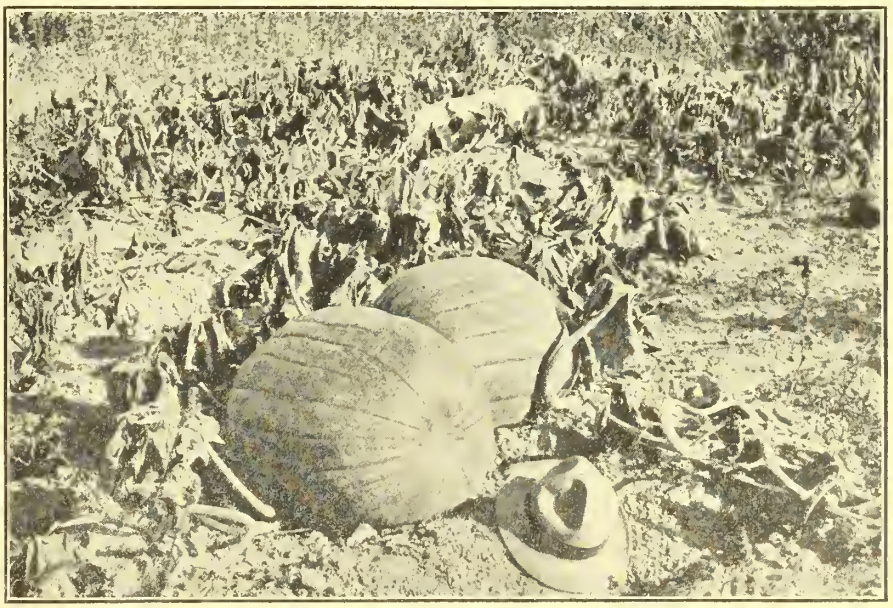
Irrigation Projects in Alberta, Canada

The following table, taken from NATURAL RESOURCES, published by the department of the interior, Ottawa, Canada, shows the irrigation projects in Alberta, Canada, now in operation or under construction:

Project	Source	Area	
		Irrigable	Irrigated to date
	River	*Acres*	*Acres*
C. P. R. Lethbridge	St. Mary	130,000	81,110
C. P. R. Western	Bow	218,980	49,752
C. P. R. Eastern	Bow	400,000	93,375
Canada L. & I. Co.	Bow	202,640	10,174
Taber I. D.	St. Mary	17,000	13,863
Lethbridge Nor. I. D.	Oldman	105,000	45,016
United I. D.	Belly	36,000	7,230
New West I. D.	Bow	4,500	3,552
Raymond I. D.	St. Mary	68,000	
Magrath I. D.	St. Mary	51,000	

In addition to these larger projects there are 496 small individual schemes within the province, for which water has been appropriated. The combined irrigable area of these smaller schemes is about 60,000 acres. The value of all irrigated crops raised in the Lethbridge district during the last five years is $25.17.

The plan for the Colorado River development provides for the building of the project through a Federal-bond issue with a unified power plant under the central control of the Government.



How many pies would these Uncompahgre pumpkins make?

PRODUCTS OF PAYSON SHEEP CLUB

STRAWBERRY VALLEY PROJECT, UTAH

The Payson Sheep Club

Strawberry Valley Project, Utah

By Heber A. Curtis, Payson, Utah

DURING February, 1926, a club of 21 Payson boys, under the leadership of Prof. R. L. Clegg of the agricultural department of the high school, organized a sheep club with Ned McBeth as president and George Starke as secretary and treasurer.

The club was formed on the assumption that the average farm in the community could profitably support a small flock of sheep without much additional expense and with considerably more profit than any other possible combination.

The plan as outlined by the boys was put up to the directors of the State Bank of Payson and the idea approved by them. Money was borrowed from the institution and a flock of registered Hampshire ewes bought from the Belleview Farm and distributed among the club members. From the very first, success attended the undertaking, for during the lambing season 200 per cent increases were recorded in many cases and especially good growth was registered in all the lambs.

FAIR AND SALE SUCCESSFUL

On August 21, 1926, the club held a fair and sale at Payson, Utah, at which some very good stock was exhibited. Local business and State organizations contributed freely, which assisted materially in making the day a success. The following out-of-town organizations made donations and contributions to help the club: Bankers' Trust Co. and National Copper Bank, Salt Lake City, Utah; Salt Lake Union Stock Yards and Salt Lake Stamp Co., Salt Lake City, Utah; American Sheep Breeders Association, and National Wool Growers Association.

Altogether about $200 in prizes were given away. Mr. Rulon Dixon, of Provo, Utah, acted as judge and the following club members were awarded prizes:

Best appearance.—First, George Davis; second, Max Cowan; third, Dean Schaerrer; fourth, Sterling Tanner.

Best flock (four or more animals).—First, Dean Schaerrer; second, George Davis; third, Max Cowan; fourth, Roy Hansen.

Best ram lamb.—First, Dean Schaerrer; second, Roy Hansen; third, George Davis; fourth, Roy Hansen.

Best ewe lamb.—First, George Davis; second, Dean Schaerrer; third, Dean Schaerrer; fourth, Frank Mortensen.

Best ewe and lamb.—First, Levi Hunt; second, Farrel Olsen; third, Ned Hancock; fourth, Ned McBeth.

Best pair of twins or triplets.—First, George Davis; second, Frank Mortensen; third, Farrel Olsen; fourth, Ned McBeth.

Best 2-year-old ewe.—First, Sterling Tanner; second, Max Wignall; third, Farrel Olsen; fourth, Ned McBeth.

Best aged ewe.—First, Dean Schaerrer; second, George Stark; third, George Stark; fourth, Ned Hancock.

About 150 head of sheep were on exhibition and a large number of sheep breeders attended the sale. Mr. Crandall, of the Mount Haggan Land & Livestock Co., of Anaconda, Mont., and Mrs. Miller, president of the Hampshire Sheep Association of America, were present, and assisted in every way to make the show a success. A large number of rams were sold at good prices. The day ended with a swim at the Arrow Head resort.

REPRESENTED AT NATIONAL RAM SALE

The club also had a pen of ram lambs at the national ram sale at North Salt Lake Stockyards. In all cases the stock of the club measured up favorably with any of those sold. The members have disposed of most of their rams at very good prices and have every reason to feel elated at their show. They contemplate a substantial increase in their flocks by purchase of additional ewe lambs.

The work of this club is being felt by the farmers and business men of the community. They are learning, through the boys, the value of better breeding stock and are already putting this knowledge into practice.

Some of the local flocks will be headed by rams from the club. The boys anticipate a much more successful year during 1927 than during 1926, as they will better understand how to care for and fit the sheep than prior to the club's organization.

Aside from the material benefits accruing to the boys through the sale of sheep and lambs, and the experience gained in caring for them, it has afforded an outlet for the boys' energies by occupying their spare time in something worth while, as well as in many cases interesting their parents in the value of purebred sheep.

Roberto Rosauer, a farmer and cattle raiser from the Argentine, who is very much interested in irrigation, called several times at the Yakima project office.

Practical Hog Houses An Important Factor

Proper housing is an important factor in the successful raising of hogs. Too often this is neglected, when little expense and effort would be required to provide good, serviceable, well-ventilated houses which give ample protection from cold and admit much needed sunshine.

The same kind of housing for hogs does not apply to all parts of the country. In Farmers' Bulletin 1487–F a number of practical hog houses for several sections of the country are described. One of the chief criticisms which may be made of the average hog house is that it is poorly lighted and ventilated, if in fact any provision at all has been made for ventilation.

The bulletin contains illustrations and floor plans showing how proper ventilation and lighting is secured in the different styles of houses. A copy of the publication may be secured as long as the supply lasts by writing to the United States Department of Agriculture, Washington, D. C.

Crop Rotation May Equal Fertilizer

In the practice of crop rotation a water user has at his command a means whereby he can materially reduce acre costs or increase the output of his land. Crop rotation is nearly as effective in increasing soil productivity as the use of manure and commercial fertilizers. Furthermore, crop rotation can be practiced usually with no outlay of money, whereas the use of commercial fertilizers requires an expenditure of money.

The beneficial effects of crop rotation are different from the benefits derived from the use of fertilizers; so that when these two farm practices are combined the one practice adds to the benefits of the other, making the resultant increase almost twice that secured by either practice used alone.

On soils long under cultivation highest yields are possible only when rotation and the use of fertilizers are practiced together.

The Colorado River development contemplates the construction of an immense dam at Boulder Canyon, raising the water level of the river higher than the Washington Monument.

Dairy records, by showing feed consumed and production of milk and butterfat, make it possible to feed intelligently and eliminate inferior animals.

Power Development on the North Platte Irrigation Project

Construction of Lingle power plant saves Government more than $1,000,000 in construction cost of Fort Laramie Canal—Enlarged plant used for Guernsey Dam construction and to supply power to commercial customers

HOW the Government was saved over $1,000,000 in excavation costs is interestingly described in a recent report by H. H. McPhail, engineer, on power development on the North Platte project, Nebraska-Wyoming. In September, 1917, under specifications No. 369 covering earthwork and structures for the Fort Laramie Canal, bids of $0.223 and $0.212 per yard were received for excavating a total of 2,900,000 cubic yards. These high bids brought up the question of power development for construction purposes. In comparing excavation costs, four methods of construction were considered by contract, and by force account with either a hydroelectric plant, a steam plant, or an oil engine plant as the source of power. The latter two were quickly eliminated, and comparative estimates on the first two indicated that by force account the work could be done at a field cost of $0.1561 per yard, or about 6 cents less than by contract. Actual results up to December 1, 1924, showed 8,500,900 yards moved at an average total cost per yard of $0.1058.

While a site near Mitchell, Nebr., was given early consideration, the site selected in November, 1917, was on the Fort Laramie Canal, about 2½ miles southwest of Lingle, Wyo., where 100 feet of head was available. The original Lingle plant comprised two 375 kilovolt-ampere generators and two 450 horsepower turbines. Location of the forebay was at station 1333+27 of the Fort Laramie Canal. The plant building is about 800 feet from the canal and a tailrace 1,200 feet long connects with the North Platte River. The penstock was of wood-stave construction and 54 inches inside diameter. Construction was commenced in March, 1918, and the plant was placed in permanent operation on May 1, 1919. Total cost of the plant was approximately $100,000, or a unit cost of $132 per kilovolt-ampere or $110 per horsepower.

During the year 1924 applications for purchase of power were received from the towns of Guernsey and Wheatland, Wyo., and from the Sunrise Mines of the Colorado Fuel & Iron Co. Construction of the Guernsey Dam, requiring a considerable amount of power for construction purposes, was also contemplated. As more than half of the installed capacity of the 750 kilovolt-ampere Lingle plant was then contracted to commercial customers, it was evident that more power capacity should be installed, if new customers were to be added and provision made for Guernsey Dam construction requirements.

A 1,000 kilovolt-ampere, two-unit hydroelectric plant at the Tieton Dam, Wash., contained two turbines similar to those at Lingle except for size, designed for operation at 70-foot head, but usable at the head available at Lingle. On completion of the Tieton Dam these two units were transferred to the Lingle plant, which was suitably enlarged to receive them. As the enlarged plant was to be a permanent feature, the old wood frame superstructure was replaced by reinforced concrete. A second forebay like the original and a second penstock of plate steel construction 66 inches in diameter were installed to supply water to the new units.

Considerable opposition developed on the project to enlargement of the plant and the addition of commercial customers on the ground that the Fort Laramie Canal would not have sufficient capacity to carry power water during the irrigation season. This opposition was withdrawn as soon as construction of the Guernsey Dam and power plant was assured.

To supplement the winter power water supply for the Lingle plant, a short diversion canal was constructed from the Laramie River into the Fort Laramie Canal. This diversion will not only save storage water in the future, but has the effect of increasing the firm power of the power system by at least 300 or 400 kilowatts. The total cost of the enlarged plant was about $187,000, or a unit cost of $107 per kilovolt-ampere, or $81 per horsepower. Work of enlargement was in progress from November, 1924, to April, 1926.

The transmission system has about 139 miles of line and nearly parallels the North Platte River on its south side from near Guernsey, Wyo., to near Gering, Nebr., with branch lines to the various towns between and to the town of Wheatland, Wyo., southwest of Guernsey. Transmission voltage is approximately 33,000. The east main line to Gering is 51 miles, the Lingle-Guernsey line, 27 miles, and the Guernsey-Wheatland branch 24 miles in length.

Four portable substations were used during the construction of the Fort Laramie division canal to supply power to the dragline excavator distribution lines at 4,000 volts. There are at present two substations that are of more or less permanent character—one at Scottsbluff and the other at Guernsey Dam. With these two exceptions, all customers have been required to supply their own substations for receiving power. On January 1, 1926, there were nine of these stations—at Torrington, Lingle, Morrell, Mitchell, Yoder, Lyman, Guernsey, Wheatland, and Sunrise Mines.

The United States had a total investment in January, 1926, of $351,847.75, the transfer value only of that portion installed up to December 31, 1924, being considered. This amount includes costs of power plant, substations, transmission lines, permanent cottages and garages, and the Laramie River diversion. Distribution to the various divisions is made as follows: Interstate, $164,686.90; Fort Laramie, $162,685.23; Northport, $24,475.62. The plant has a creditable record for continuous operation, with a total length of interruptions of 339 hours in six years and two months of operation.

The average operation and maintenance cost per kilowatt-hour has been $0.02171, and the average return from commercial customers per kilowatt-hour delivered has been $0.0281. Gross returns from commercial customers for the year 1925 were $58,208.35 and total returns up to December 31, 1925, were $292,662.51. All power used by the United States has so far been charged out at cost, the depreciation on the system up to December 31, 1924, when it was transferred to a permanent power system, however, being absorbed by the construction work.

For the first few months of operation of the Lingle plant, the power output was used entirely for construction and Government camp purposes. Torrington, the first commercial customer, was added in December, 1919, followed by other towns and the Dutch Flats drainage pumping plant in 1920. By 1921 practically half of the plant output was being sold to commercial customers. At the end of the construction period in 1924, the load became practically all commercial. On April 1, 1926, the project power system was delivering power to nine commercial customers. Contracts covering the sale of power follow the standard Bureau of Reclamation form, with one standard rate and only a few slight variations as to discounts.

Organization Activities and Project Visitors

DR. ELWOOD MEAD, commissioner of reclamation, had hardly returned to the Washington office from his trip to Haiti to investigate one of the irrigation possibilities there when he was called upon to go to Cuba for a like purpose, returning early in October.

H. W. Nicoldsen, senior engineer of the irrigation service of Punjab, India, was in the Denver office recently making up an itinerary for a trip throughout the Western States to obtain information concerning methods of construction of high dams. He will visit a number of our projects.

Stan Spacek, a representative of the Czechoslovakian Government, met the chief engineer and the designing engineer of the Denver office recently as the first step in an inspection of the reclamation projects where construction is going on and especially the building of dams.

J. J. Doland, assistant engineer in the Denver office has resigned to accept a position as instructor in the College of Engineering, University of Illinois.

Price O. Craven, senior clerk in the Denver office, has resigned.

A. C. Cooley of the United States Department of Agriculture, Mr. Ruzicka, county agent, and Mr. Oliphant, assistant county agent, visited the Huntley project recently to consult with Superintendent McGinness in regard to carrying on the demonstration work on the project.

T. R. Smith, junior engineer, in charge of hydrography at American Falls Dam, has been transferred to the Denver office.

N. C. Grover, chief hydraulic engineer of the Geological Survey, was a recent visitor at American Falls Dam.

Recent visitors to the Milk River project included C. D. Greenfield, settlement agent of the Great Northern Railway; A. C. Cooley of the United States Department of Agriculture; and S. G. Dawson and W. T. McFarland of the Canadian reclamation service.

District Counsel Alexander was on the Grand Valley project recently preparing the draft of a repayment contract and public notice.

Copley Amory, expert in reclamation economics, has returned to the Washington office after a month's trip through several of the Atlantic seacoast States in connection with the bureau's study of planned rural development.

An engineering board consisting of Louis C. Hill, consulting engineer; S. O. Harper, construction engineer; and Ora McDermith, consulting engineer, spent several days on the Carlsbad project making studies relative to increasing storage facilities for the project.

Dr. Hugh A. Brown, Chief of the Division of Settlement and Economic Operations of the Washington office, left on October 17 for a trip through the Southern States to meet the various governors and other State representatives and to discuss plans for the visit later in the year of a commission of three experts along agricultural, settlement, and economic lines in connection with the bureau's study of planned community development in the South.

Mr. F. A. Kern, Secretary of the Kittitas Reclamation District, paid a personal visit at Reclamation headquarters in Washington while on other business in the East.

Doctor Nelson, Chief of the Biological Survey, accompanied by Ray Steel, in charge of this work in Oregon, and George Tonquin, in charge of similar work in California, called recently at the Klamath project office to discuss local conditions as affecting the life of migratory birds.

C. C. Cragin, general manager of the Salt River Valley Water Users' Association, is in Washington to secure approval of a contract for additional sale of electric power which will add $250,000 to the annual revenues to the Salt River project.

George C. Kreutzer, director of reclamation economics, conferred recently with owners of unimproved lands on the Orland project.

E. B. Debler, J. L. Lytel, and A. W. Walker convened on the Klamath project as a board to report on the reclamation of Tule Lake.

General Foreman Charles Farmer has been in charge of the installation of the sixth unit at the Minidoka power house, Minidoka project.

M. G. Cutting, agricultural writer for the Country Gentleman, visited the Belle Fourche project recently to gather material for an article dealing with the farmers' stand on present reclamation policies.

Glenn F. Engle, assistant engineer on the Newlands project, has resigned to devote all of his time to his ranch interests.

H. F. McPhail, electrical engineer in the Denver office, made a study recently of the proposed pumping site at Shell Rock Point, Okanogan project. He also ran out trial lines for the proposed pump main from the river to the project canals, and looked over the McLaughlin Canyon dam site and the possibility of storage of water in Osoyoos Lake.

B. T. Ploeger, levelman on the Shoshone project, has resigned to accept employment on the municipal water supply works for the East Bay cities, California.

J. R. Iakish, associate engineer on the Shoshone project, has been transferred to drainage investigations on the Vale project, Oregon.

William H. Tuller has been elected by the Board of Control, manager of the Boise project to succeed J. B. Bond, who has resigned to accept a position with an engineering concern in Mexico.

B. A. Shumakov, irrigation engineer from Russia, was a recent visitor on the Yuma project. He was interested particularly in the Laguna Dam.

A board of engineers, comprising D. C. Henny, S. O. Harper, and L. M. Lawson, convened at the Rio Grande project office to consider plans and make recommendations for the construction of a main diversion canal in the lower part of the El Paso Valley, and for the purpose of consolidating diversions and preventing the unauthorized use of water.

J. F. Partridge, engineer for the California-Oregon Power Co., conferred recently with H. K. Smith, hydrographer, Klamath project, in regard to the control of Upper Klamath Lake.

Contracts Under the Act of December 5, 1924, Umatilla Project

A CONTRACT has been entered into between the United States and the West Extension irrigation district, providing for the transfer of the management of certain of the Umatilla project works to the district and for the repayment of construction costs upon a crop production basis. The contract is dated April 27, 1926, and consists of 18 typewritten pages. After the formal preamble and certain explanatory recitals, the contract provides for the transfer to the district of the care, operation and maintenance of the Three Mile Falls Dam and all canals, sublaterals, ditches, structures, distribution and drainage systems, and other works constituting that part of the Umatilla project irrigation system theretofore operated by the United States in connection with the irrigation of lands of the district. The district agrees to maintain and operate the works in a careful and proper manner. The United States reserves the right to inspect the transferred works from time to time to ascertain whether they are being properly maintained.

PAYMENT ON CROP RETURN BASIS

The contract then provides for the payment of the construction charges on a crop-return basis, the following being the language used in this part of the contract: "The installment of the construction charge per irrigable acre of project lands in the district payable each year shall be 5 per cent (5%) 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 the 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. The Secretary will determine the average gross acre income from said lands for the 10 years preceding the year 1927, 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 (for which water is available as determined by the Secretary) as said irrigable acreage is shown at the the time on the official farm unit plats of the west division of the Umatilla 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."

Any owner of project lands in the district who does not desire to accept the new basis of payment is to be permitted to continue on the old basis, upon his advising the district in writing on or before September 1, 1926, that he does not wish to make his payments on the crop-return basis.

REDUCTION OF PENALTY

Before the contract became effective the district was obligated to pay a penalty at the rate of 1 per cent per month upon all charges due from the district to the United States and not paid when due. The contract reduces this penalty to one-half of 1 per cent per month, as permitted by section 4 of the act of December 5, 1924, this reduction in penalty, however, being applicable only to charges becoming due subsequent to December 5, 1924.

Beginning with the year 1926 the board of directors of the district assumes the duty and responsibility of determining and announcing the annual operation and maintenance charges for the lands of the district. These charges are to be collected in advance beginning with the year 1927 and no water is to be delivered until such charges are paid. The district is also empowered to levy a toll charge to meet the annual cost of operation and maintenance.

EMPLOYMENT OF PROJECT MANAGER

The United States is to turn over to the district certain of the operation and maintenance equipment, and the cost thereof is to be included in the construction charge payable by the district. During the period before the construction charges are paid in full, the district is to employ a project manager satisfactory to the Secretary of the Interior, and the contract gives the Secretary the power to discharge such manager if his services become unsatisfactory. Such an article is necessary to protect the rights of the United States during the time when the district is indebted to the Government for the construction cost of the project.

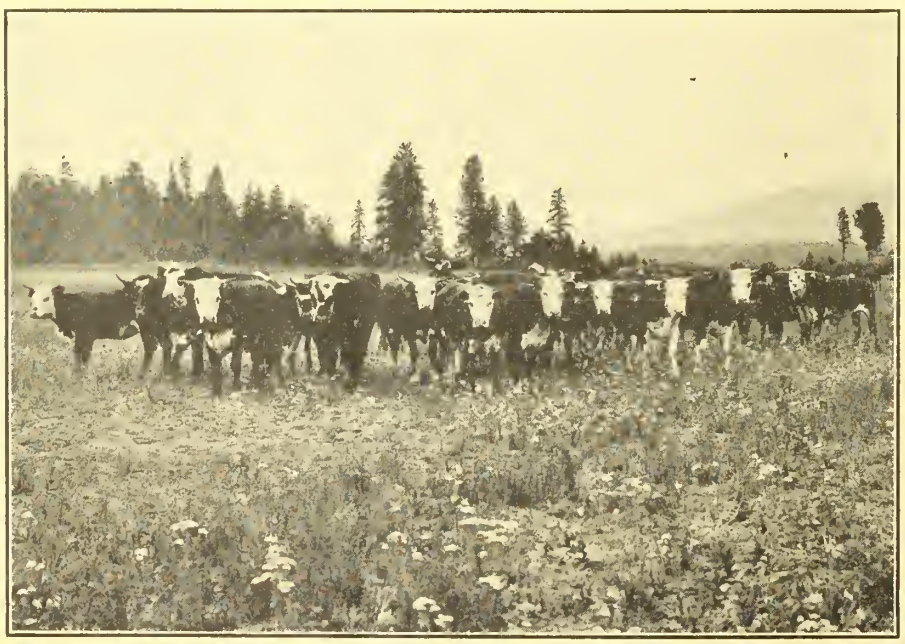
The district is obligated to install and maintain a modern set of books of account, and also to keep an accurate record of all crops raised on the lands of the district. The United States is to take, from time to time, a crop census covering the district lands. This, of course, is for the purpose of checking the data furnished by the district, as well as for securing the information necessary to enable the Secretary of the Interior to determine the per acre construction charge applicable to the land of the district.

The United States is empowered, in case of a breach of any of the terms and conditions of the contract by the district, to terminate the contract upon one year's notice to the district.

WATER DENIED TO DELINQUENTS

A very important provision of the contract is that prohibiting the delivery of water to any tract of land in the district, when the owner is in arrears more than one year in the payment of any operation and maintenance or construction charge.

Ordinarily land belonging to the United States is not taxable by an irrigation



Hereford cattle on the Klamath project, Oregon-California

district organized under State law, but in 1916 Congress passed a statute known as the Smith Act (act of August 11, 1916, 39 Stat. 506) permitting irrigation districts, with the consent of the Secretary of the Interior, and after compliance with certain conditions, to levy valid assessments upon Federal land within an irrigation district. The contract now under consideration contains an article by which this act of Congress is made applicable to the lands of the United States within the West Extension irrigation district, a copy of the list of lands so affected bin g attached to the contract as Exhibit A.

A contract of the same general tenor as that above outlined is pending, and probably will be entered into at an early date between the United States and the Hermiston irrigation district. The Hermiston irrigation district contract has now been confirmed by the courts of Oregon, and the execution of the contract is only awaiting the checking by the General Land Office of the list of public lands to be attached to the contract as Exhibit A.

Potato Records Broken by California Growers

Delta lands near Stockton, Calif., recently shattered their own world's record in potato yields. A yield of 61,420 pounds of potatoes was officially recorded from the Henning tract of the Zuckerman Bros. Three acres produced more than 60,000 pounds each.

This season the Zuckerman Bros. planted 1,500 acres of potatoes, producing 375,000 sacks of potatoes, making an average yield of 250 sacks per acre of No. 1 potatoes and 25 sacks of No. 2. They see no reason why they should not produce 350 sacks to the acre on the entire area of 1,500 acres, and are planning to do this next year.

Notes From Our Projects 10 Years Ago

From the Reclamation Record of November, 1916

PICKING of cotton continued on the Salt River project, but there was a dearth of pickers. At the end of the month some long staple seed cotton sold at 8½ cents and lint cotton at 30½ cents. This is the highest price on record, and as the outlook is for an unusually heavy production per acre this should prove to be a banner year for the cotton industry on the project.

A meeting of the Indian reservation water users was held at the Bard schoolhouse, Yuma project. The project manager conferred with the farmers on the subject of the elimination of unproductive areas. The meeting was successful in bringing about a feeling of harmony as to the efforts of the service in making recommendations which would correlate the present unproductive-land problem with the necessity of further drainage work and the payment therefor.

At the Grand River dam, Grand Valley project, the work of installing the power plant and operating equipment was continued. Delivery of one chain shaft was made by the contractor.

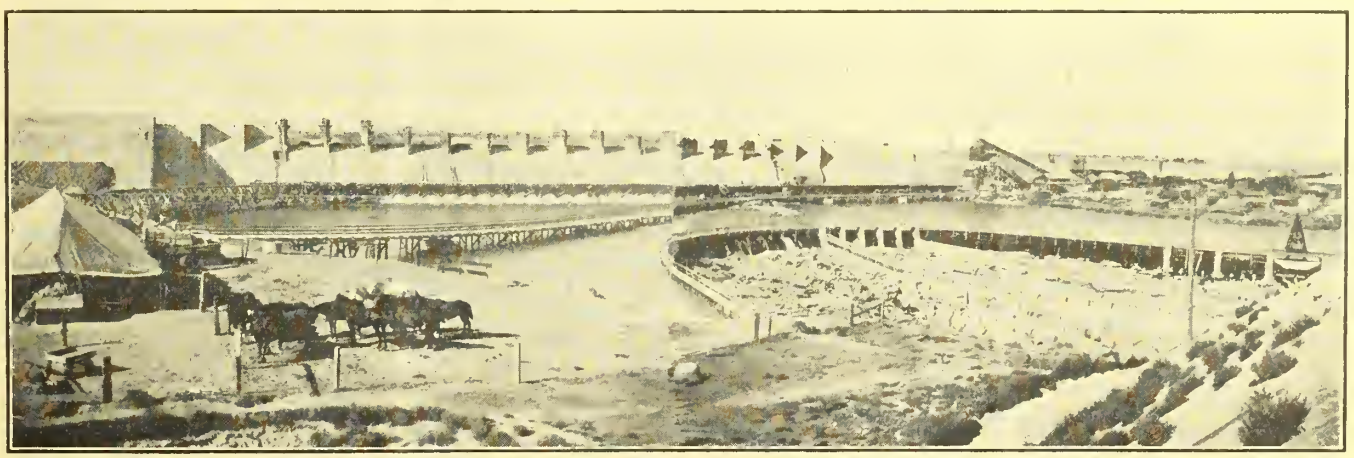
Embankment construction at Sherburne Lakes dam, Milk River project, was in progress throughout the month, using material excavated from the spillway cut and borrow pit. The trimming of excavation and digging, by hand, of cut-off trenches preparatory to running concrete in the spillway crest was practically completed

A great many of the farmers on the Uncompahgre project are raking and burning potato vines and weeds, which will do much toward keeping their land free of disease and weeds in the future. They are also planning to bring in several carloads of dairy stock this fall.

Sufficient acreage has been signed up by farmers on the Newlands project for the raising of beets to insure the operation of the local sugar factory during the 1917 season. The factory has been inactive since 1914.

The cotton crop is being picked and ginned. About 60 bales were ginned during the latter part of the month. The lint is of extra good quality and it is believed that its yield will be good, although boll worms have done considerable damage in many fields. A new cotton gin has been erected at Otis and is in operation.

The acreage on the Rio Grande project required by the sugar company for growing sugar beets next year has all been signed and the company agrees to take the beets at the nearest railroad point and to pay a flat rate of $5 per ton for them. The first Sugar-beet Day was celebrated at Las Cruces on September 20, with a large crowd of farmers in attendance. Speeches were made by representatives of the sugar company, agriculturists, and others, and considerable enthusiasm was manifested.



Progress of construction at American Falls dam, Idaho

Riverton Crops Win First Prizes

W. T. Peyton, gatekeeper at Wind River diversion dam, shows the way

W. T. PEYTON is gatekeeper at the Wind River diversion dam on the Riverton project, Wyoming, where 20 farm units were opened to entry in the spring. He has had considerable experience in farming and gardening under irrigation and is enthusiastic about that line of work. In March, 1926, he broke up about 4 acres under the Wyoming Canal just below the diversion dam for a garden. He used no fertilizer. His regular duties as gatekeeper were rather strenuous, as they included ditch riding and a good deal of maintenance and betterment work, so that his time for gardening was limited. In addition to his garden work, he set out and is carefully attending a large number of trees, shrubbery, bushes, and plants. The Wyoming State Highway to the southern entrance of the Yellowstone Park runs past this tract and in a few years, after the trees and bushes have grown to a more conspicuous size, Mr. Peyton hopes to have this plot developed so that it will be a splendid advertisement for the Riverton project.

The first of a new series of Fremont County fairs was held at Riverton recently. This came at a time when Mr. Peyton was unusually busy with maintenance work. He rather hastily got together an exhibit of potatoes and vegetables for the fair. In competition with land that has been farmed for three to forty years, Mr. Peyton took the following prizes:

First.—Irish Cobbler potatoes, summer squash, celery, table peas, green peppers, Great Northern beans.

Second.—Potato display, Russet Burbank potatoes, cucumbers, turnips, cauliflower, rhubarb, pinto beans.

Third.—Crooked neck squash, pickling cucumbers, Swiss chard, beets, string beans.

In addition he had excellent melons, table beets, cabbage, onions, and corn.

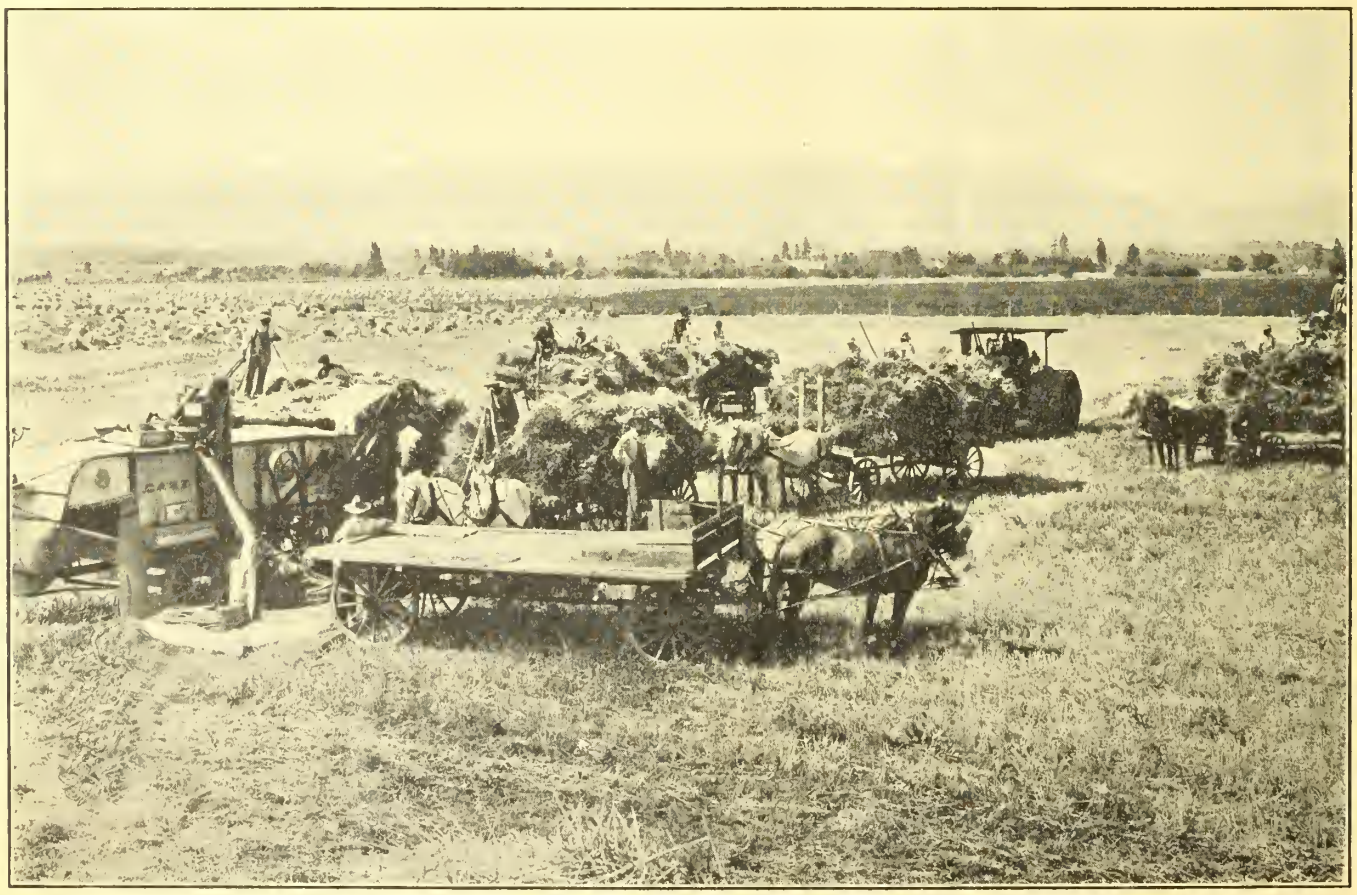
Joe Goodwin, a laborer living at Pavillion, had an exhibit from his garden patch which made a very creditable showing considering his entire lack of experience in farming under irrigation.

Yakima Valley Will Ship 50,000 Carloads

Dean Guie, writing in the Yakima Valley Progress, estimates that 50,000 carloads of agricultural and other products will be shipped from the Yakima Valley to national and foreign markets by the end of the 1926–27 season. This enormous production should bring an estimated gross return of more than $40,000,000.

Apples will constitute the largest tonnage, and it is estimated that between 15,000 and 16,000 cars of the fruit will be marketed. On the basis of $1.15 a box to the grower, the producers will be paid between $13,000,000 and $14,000,000 for this crop alone. Pears, peaches, potatoes, hops, sheep, and hogs will make up the other large shipments.

The best way for a man of moderate means to establish a high producing herd of dairy cattle is to start with a small number of cows and use good purebred bulls.



Threshing grain in the Kittitas Valley

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1926

ADMINISTRATIVE ORGANIZATION FOR THE BUREAU OF RECLAMATION

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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	Ottamar Hamele	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.	A. R. McGinness	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.
Rio Grande	El Paso, Tex.	L. M. Lawson	V. G. Evans	L. S. Kennicott	Ottamar Hamele	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	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont.	G. O. Sanford	H. W. Johnson	F. C. Lewis	E. E. Roddis	Billings, Mont.
Umatilla	Hermiston, Oreg.	H. M. Schilling	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.
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.
Umatilla, McKay Dam	McKay Dam, Oreg.	R. M. Conner [6]	C. B. Funk	W. S. Gillogly	B. E. Stoutemyer	Portland, Oreg.
Kittitas	Ellensburg, Wash.	Walker R. Young [6]	E. R. Mills		do	Do.
Sun River, Gibson Dam	Augusta, Mont.	Ralph Lowry [6]			E. E. Roddis	Billings, Mont.
Orland, Stony Gorge Dam.	Stony Gorge Damsite, Elk Creek, Calif.	H. J. Gault [6]			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	
Owyhee	Boise, Idaho	R. J. Newell	
Vale	do	do	
Payette division, Boise	do	do	
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 all water users on the reclamation projects under the jurisdiction of the bureau who wish to receive the magazine. To others 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.

ORGANIZED RURAL COMMUNITIES

THE foundation of reclamation, both in the West and the South, should be organized rural communities, with a definite agricultural program, and organized so as to cooperate in social and business affairs, in order that a community may function as a unit rather than as a number of isolated individuals. The absence of any sense of permanence, of a properly trained body of farmers, and of any kind of business organization all tend to make the farmer inefficient, place him at a disadvantage with the organized industries of cities, and are leading to a continuous depletion of soil fertility and decadence in the quality of the rural population. If we could create the right type of community, animated by the right ideals, on these unpeopled or neglected lands, we would set an example that might have far-reaching results.

—*DR. ELWOOD MEAD,*
Commissioner of Reclamation

I 27.5: 1926

NEW RECLAMATION ERA

VOL. 17 DECEMBER, 1926 NO. 12

THIS BEET SUGAR FACTORY ON THE LOWER YELLOWSTONE PROJECT HAS A DAILY CAPACITY OF 1,200 TONS

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The PROGRESSIVE PROJECT FARMER

What He Is—

Patient when patience is desirable

Peaceful and pleasant in all classes of company

Peer in his special field of farm work

Persistent and persevering

Powerful in perception but not repugnant

Pleasing in personality

Philanthropic and benevolent

Pioneering toward educational advancement

Plain, clear, and simple in his habits of daily life

Playful, but plucky and progressive

Popular, but positive and dependable

Prompt in the payment of personal dues

Picking each day the proper path toward permanent progress

Proclaiming silently his purpose to push to the front

Prosperous, but also positive in promoting public welfare

What He Is Not—

Passive concerning perplexing questions

Pessimistic concerning a doubtful future

Pest-like with his associates

Petrified in his thoughts and habits

Pilferous or petty with the precious rights of others

Plundering the property of his neighbors

Petting himself in his own mistakes

Pompous about his accomplishments

Procrastinating the attack of hard work

Pouting or pow-wowing about his misfortunes

Prematurely demanding high prices for inferior products

Pretending to be what he is not

Preying on the rights of the weak or the humble

Prodigal or wasteful of his money, his time, or his personal energies

Profane or irreverant to his God

—PROF. O. W. ISRAELSEN

Utah Agricultural College

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. 17 DECEMBER, 1926 No. 12

Interesting High Lights on the Reclamation Projects

THE Lower Yellowstone project furnishes an example of the returns possible from specialized agriculture. Robert Flynn, of Fairview, produced $800 worth of cabbages on 1¼ acres, or at the rate of $600 per acre.

THE Fallon Sugar Company took title recently to the sugar factory at Fallon, Newlands project. Contracts are being signed for beet acreage, and it is reported that the factory will be in operation in 1927.

A COTTON growers' association has been formed on the Rio Grande project to handle cotton sales and assist in financing the crop. There has also been considerable discussion of the organization of a project marketing association for fruits and farm products generally.

ON the Belle Fourche project the sugar-beet yield will average about 14 tons per acre. Some yields above 20 tons were reported, and a number of growers produced 18 tons. At the prevailing price of $8 per ton the returns per acre will probably exceed all former production.

THE Colorado Agricultural College, through its extension department, is conducting a series of experiments on one of the farms on the Uncompahgre project in connection with sheep feeding. Various methods of feeding and various kinds of feed are being used to determine the best practice to be followed.

HUNTLEY project sugar-beet growers are wearing the smile that won't come off. Excellent weather and labor conditions made it possible to harvest the crop in a very short time. Yields were invariably excellent. Several growers in the vicinity of Ballantine reported a total yield of more than 1,000 tons.

SUGAR-BEET growers on the Milk River project are also smiling. On the Malta division several fields yielded in excess of 15 tons per acre. The maximum reported from a field on the Chinook division yielding 26 tons per acre. The sugar content averages about 16 per cent. A considerable increase in the acreage of beets is anticipated for next season.

PRELIMINARY reports on sugar beets grown on the Sun River project show yields of about 12 tons per acre with a high-sugar content, which will probably result in a price better than $7 per ton for the growers. As a result of favorable crop condition and prices, there is a much better feeling existing among the farmers on both the Fort Shaw and Greenfields divisions.

THE apple yield on the Yakima project appears to be the largest in the history of the project. At the end of October practically the entire crop was under cover, with all warehouses packed to capacity. Shipments of apples from the valley to October 31 exceeded those to the same date last year by 2,359 cars. Shipments of fruit from the valley this year totaled 12,691 cars and of vegetables 4,175 cars, or 1,122 cars more than were shipped up to the same date last year.

THE Powell creamery, Shoshone project, purchased 10,500 pounds of butterfat during October, manufacturing 13,000 pounds of butter and 175 gallons of ice cream. Other agencies purchased 3,000 pounds of butterfat. About 5,300 pounds of cream were shipped from the Frannie division.

DURING October 341 carloads of agricultural products were shipped from the Yuma project, valued at $490,600, bringing the total since the first of the year to 2,669 carloads, valued at $2,630,600.

WORK at Stony Gorge Dam, Orland project, consisted chiefly of clearing brush from the dam site, excavating test pits in the gravel deposits from which aggregates for the concrete for the dam will be obtained, and in cross sectioning.

THE board of directors of the Orland Unit Water Users' Association recently levied an assessment, due November 30, of $5.20 per acre, $3.30 of which is for the current year's installment of the building charge, $1.60 for the 1926 operation and maintenance charge, and 30 cents for association operating expenses.

THROUGH the cooperation of the Forest Service information has been furnished to sheep and cattle men concerning the pasturage and feeding possibilities of lands on the Grand Valley project and considerable interest has been aroused. It is believed that this practice can be built up to a point which will furnish a considerable market for forage and also yield a return to the water users for pasturage and other products not otherwise marketable.

ONE way in which the fruit shippers of the Yakima Valley helped to celebrate National Apple Week was to ship two cars of extra fancy apples to charitable institutions in Washington, D. C., and New York City.

AT American Falls Dam nearly 21,000 cubic yards of earth fill were placed in the left embankment, and a large amount of rock fill and riprap was placed on both the upper and lower faces of the right embankment. All radial gates and hoists were installed. Cleaning and spraying of the face of the dam were continued. At the end of the month about 25,000 acre-feet of storage had accumulated in the reservoir.

20762—26

President Coolidge Approves Vale (Oregon) Project Construction

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 October 21, 1926, approved the construction of the Vale irrigation project in Oregon, as submitted to him in the following letter from the Secretary of the Interior:

THE SECRETARY
OF THE INTERIOR,
Washington, D. C., October 20, 1926.

THE PRESIDENT,
The White House.

MY DEAR MR. PRESIDENT: 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 requiring investigation and report under this subsection will be discussed in connection with the Vale project in Oregon in the order in which there presented, as follows:

WATER SUPPLY

Source.—Warm Springs Reservoir of the Warm Springs irrigation district on the Malheur River. The water and storage rights necessary for the development of the project would be purchased at cost from the Warm Springs irrigation district. A portion of the purchase price for storage, $150,000 to $200,000, is to be expended in the construction of a drainage system for the Warm Springs irrigation district. This district is at present in serious financial difficulties, due mostly to the development of seepage, which has not been remedied because of a lack of finances.

Shortages.—Past records indicate that with the storage now available shortages will occur in the drier years. Provision has been made in the contract for sufficient funds to provide additional storage by raising the Warm Springs Dam should these shortages prove serious.

Storage capacity.—The Warm Springs Reservoir has a normal capacity of 170,000 acre-feet. By the installation of crest control gates the reservoir surface may be raised 4 feet, thus providing additional capacity which may be utilized as hold-over storage. This would give a total reservoir capacity of 190,000 acre-feet.

ENGINEERING FEATURES

Storage.—Addition of crest control gates to present dam at Warm Springs Reservoir.

Diversion.—A diversion weir about 12 feet high and 150 feet long will be required on the Malheur River. Location will be about 1 mile west of Namorf station on the Oregon Short Line (Ontario-Crane branch).

Main canal.—Located on north side of river for 1 mile. Near Namorf station the canal crosses the river by a steel flume on a steel bridge. It then parallels the river for 4 miles and again crosses the river by a circular concrete siphon. At two intermediate points steel flumes would be required. On the remainder of the canal line within the canyon there would be 9,715 feet of concrete bench flume.

Power and pumping plants.—On the Harper division a pumping plant is planned to provide water for about 2,000 acres, power being secured by dropping water back to the river.

Drainage.—Bench lands have comparatively good natural drainage, with frequent watercourses for removing waste water. Following irrigation a moderate amount of drainage will be needed.

COST OF CONSTRUCTION, BY FEATURES

Storage	$690,000
Main canal	2,500,000
Laterals	280,000
Drainage	120,000
Total	3,590,000

LAND PRICES AND PROBABLE COST OF DEVELOPMENT

The project lands have been appraised by a board of three members, one appointed by the department, another by the district, and the third selected by these two. Their report, approved by me, establishes an average value of $11 per acre for the irrigable land, without improvements. Land too high in elevation to be irrigated, or of uneven surface, was appraised as low as $1.25 an acre. Contracts will be made with the landowners for sales to settlers at not to exceed these prices to prevent speculation. Nearly 40 per cent of the project lands are owned by two companies. About 15 per cent of the lands are still held by the Government and would be allotted to selected settlers.

FINDING REGARDING FEASIBILITY OF PROJECT

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

ADAPTABILITY OF LAND TO SETTLEMENT AND FARM HOMES

The Vale project is based on the purchase of one-half the Warm Springs Reservoir. This enables 32,000 acres in the Warm Springs district to be reclaimed through drainage and will enable the 500 settlers who have farms in this district to resume their profitable cultivation. The stored water which is to be purchased is to be used to irrigate land in the vicinity of Harper and Vale, Oreg., by a canal diverting from the Malheur River about 10 miles above Harper and paralleling the Malheur River and Willow creek to Jamieson, Oreg. It will supply water to 28,350 acres classed as susceptible of profitable cultivation under irrigation. About 2,400 acres in the vicinity of Jamieson and 400 acres near Harper now receiving an inadequate water supply are included in the project. The average construction cost is about $125 an acre.

The climate and soils of the project are adapted to the production of all temperate-zone crops and fruits with yields equal to those obtained on the Boise project. The main crops that can be profitably grown under irrigation are alfalfa, the small grains, Indian corn, red clover, potatoes, and many others of minor importance. Topography is generally excellent. A soil survey by the Bureau of Soils indicates deep and fertile soils over the greater part of the project. A detailed classification of the land on the

basis of three classes of profitably productive land indicates one-half of all the land to be of the first class and the balance divided between second and third class. Branch lines of the Union Pacific Railroad are at a maximum distance of 4 miles from the irrigable land. The town of Vale, county seat of Malheur County, Oreg., especially will benefit by the construction of this project, and several smaller communities will grow and profit thereby.

The 28,350 acres requiring a full water supply is in its natural state adapted only to grazing stock and even then only for a short period in each year, due entirely to to low rainfall in that region. Dry farming has been tried but failed. With an ample water supply for irrigation this area will sustain a highly intensified agriculture and make homes for from 400 to 500 additional families. In addition to this it will rehabilitate the Warm Springs irrigation district, having an irrigable area of about 32,000 acres, thus saving the investments already made by many American farmers therein.

PROBABLE RETURN TO RECLAMATION FUND OF COST OF CONSTRUCTION

The next declaration required is that the cost of construction will probably be returned to the reclamation fund. This is interpreted to mean that it will be returned within the period fixed in the contract with the Vale, Oregon, irrigation district, which is in 40 years from the time the public notice that the works are completed is issued by the Secretary.

The average construction cost is estimated at about $125 an acre, making the yearly construction payment about $3.10 an acre. The estimated yearly crop income is $37.50 an acre. It would seem that this would enable construction and operating costs to be paid without hardship to the settlers.

Some of the causes of delinquencies in repayment which have occurred on existing projects will be averted on the Vale project. One is the injurious effect of land speculation, which will be prevented by requiring the large private landholdings to be subdivided and sold to settlers at a fair price. Provision will be made for giving the farmers practical advice in farm development and in working out a crop program. Settlers on the public lands of the Vale project will be selected, as provided in recent legislation. Such selection is destined to be an important factor in the development and solvency of future projects. It is recognized that the feasibility of reclamation depends on securing suitable settlers. This fundamental requirement for the success of Federal reclamation has been stressed by this department during the past two years. It is a vital element in all calculations and forecasts.

Settlers will begin the farm development of this project under the following favorable conditions: Increase in agricultural production in the Nation is not keeping pace with increase in population. They will realize at the outset that their farms must be intensively cultivated and will be helped to organize for cooperation in production and marketing.

The favorable conditions heretofore recited and the newly established policy of the bureau jusitfy the belief that this project will return the cost thereof.

Because this is regarded as one of the projects best suited to the needs of settlers and appropriate for development under the reclamation law, I recommend its approval and the issuance of the necessary authority to this Department to make contracts for its construction, and to proceed with the work.

Very truly yours,

HUBERT WORK.

Approved October 21, 1926.

CALVIN COOLIDGE,
President.

It takes from 20 to 30 per cent more feed to produce a quart of milk from poor cows than it does from good cows.

Cutting alfalfa in the Milk River Valley, Montana

Contract Between the United States and the Truckee-Carson Irrigation District

Providing for the transfer of the management of the irrigation works of the Newlands project, Nevada, to the district and for the repayment of construction charges by the district

THE Secretary has recently approved a form of contract to be entered into with the Truckee-Carson irrigation district for the transfer of the management of the irrigation works of the Newlands project, Nevada, to the district and for the repayment of construction charges by the district.

The district comprises about 78,000 acres of irrigable lands of the Newlands project, about 44,000 of which are under water-right application, about 20,000 acres of which have vested water rights by reason of irrigation antedating the inception of the project and the remainder not being under water-right application.

The owners of land under water-right application are to have the option either to continue on the basis of payments fixed in their existing contracts, or to modify such contracts so as to be permitted to complete their payments within a longer period of time, as permitted by the act of Congress of May 25, 1926 (44 Stat. 636).

The contract is to transfer to the district the custody of the entire project, including Lahontan and Tahoe reservoirs and the lands withdrawn or purchased in connection with the reservoirs. The district is to agree to care for and operate the project in a careful manner and in such away that the transferred works shall remain in as good and efficient condition for the development, diversion, and distribution of irrigation water and for the development of power as is the case at the time the works are turned over to the district.

All those water users who desire an extension of time within which they may pay charges that are delinquent at the date of the contract are to make application for such privilege. Delinquent construction charges so extended are to be payable within 15 years, with interest at the rate of 6 per cent per annum. Delinquent operation and maintenance charges when extended are to be payable within 5 years, with interest at the rate of 6 per cent per annum.

In the contract the district is to assume the payment of the construction cost of the project, as reduced by the adjustment act of May 25, 1926 (44 Stat. 636). The district is to act as fiscal agent of the United States for the collection of construction charges from the owners of lands under water-right application who do not consent to amend their applications to conform to the proposed district contract.

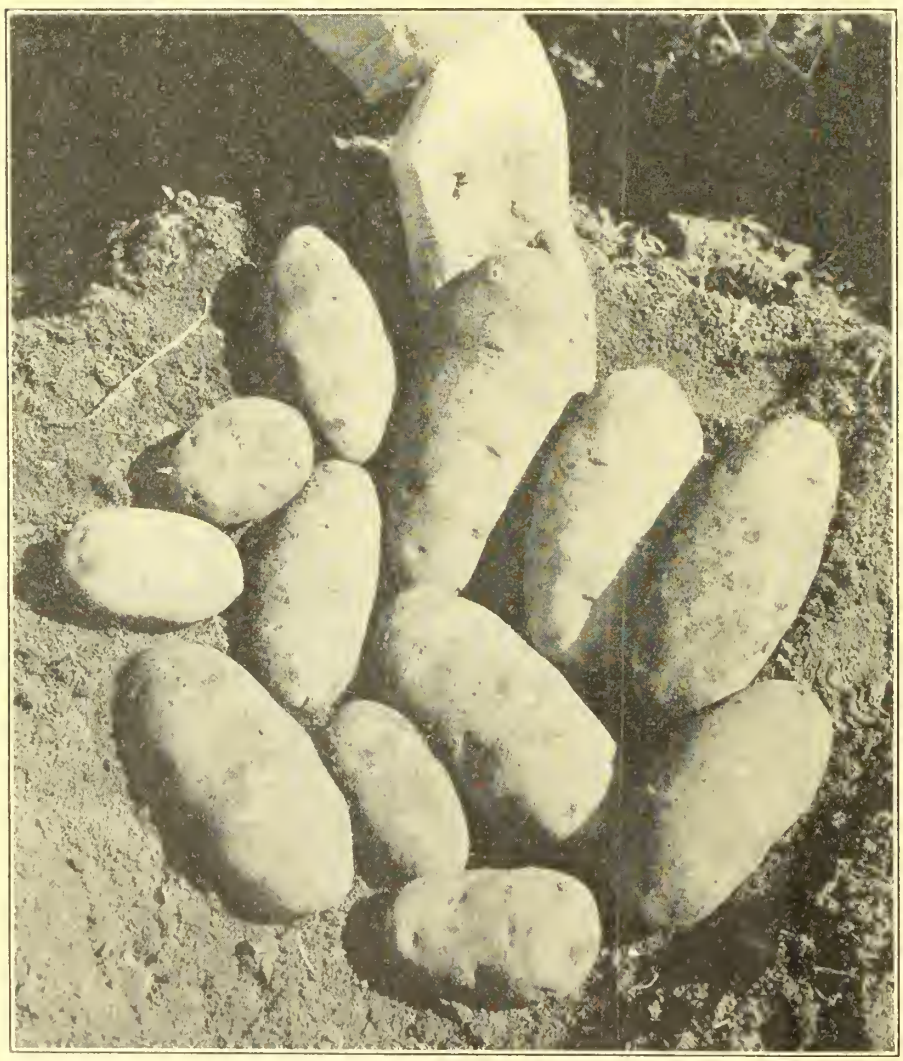
The period of time within which the construction charges not due at the date of the contract may be paid is fixed in the contract in the following language:

"(*a*) Each consenting application landowner, the first payment on whose contract matured on or before December 31, 1916, may complete the payment of his unaccrued and unpaid construction charges in equal semiannual installments within 40 years from the date of the first payment which matured under his application.

"(*b*) Each consenting application landowner and each nonapplication landowner, the first payment of whose construction charge matured or matures later than December 31, 1916, and prior to January 1, 1937, may complete the payment of his construction charges in equal semiannual installments, the last of which shall be payable not later than July 15, 1957.

"All owners of nonapplication lands and/or of application lands, the first payment of the construction charges on which may mature subsequent to January 1, 1937, must complete the payment of their construction charges in such number of installments, of such amount per installment per irrigable acre, and on such due dates from the district as may be here after fixed by the Secretary."

The form of contract provides for the payment of interest at the rate of 6 per



Just spuds, but the kind that mean money to the grower

cent per annum from the due date to the date of payment upon all charges which are not paid when due.

The operation and maintenance equipment owned by the United States at the time that the district takes over the project is to be turned over to the district so far as desired by the district board of directors. The district is to make payment therefor in 15 equal annual installments.

In order that the Government may know that its investment in the project is protected, the manager employed by the district after the project is taken over by the district is to be and remain satisfactory to the Secretary of the Interior during the period preceding full, payment of the construction charges.

The district is to keep a careful record of its financial and other transactions and this record is to be accessible to the employees of the United States. The Secretary may also cause to be made from time to time an inspection of the transferred property, and the district is to bear the cost of such inspections.

The district, as required by State law will apportion the benefits of the contract to the various tracts of land in the district, and after the confirmation by the court of such apportionment the liens reserved to the United States in the patents issued under the reclamation laws will be released, under the provisions of section 2 of the act of Congress of May 15, 1922 (42 Stat. 541), as to consenting application land.

Article 24 of the proposed contract provides for joint liability, and on account of its importance, is quoted below in full:

CHARGES A GENERAL OBLIGATION OF THE DISTRICT

"The district is obligated to pay to the United States the full amounts herein agreed upon according to the terms stated regardless of individual default in the payment of any assessment levied by the district, but it is understood and agreed that when construction assessments on any tract of land in the district have been paid in an aggregate amount equal to the full amount of such land's construction charges and of all the items mentioned in this agreement, such tract of land (hereinafter referred to as paid-up land) shall thereafter be liable for construction assessments for the purpose of meeting the obligations of the district under this contract only in the event that the district is delinquent in its payment to the United States, and/or only to the extent that assessments are levied to meet estimated or existing delinquencies in the payment of charges, and may be assessed at a lesser rate than the rate applicable to lands of similar class which are not paid up in full, if such lesser rate, together with the district's other collections are sufficient to meet the district's obligations, or estimated obligations to the United States, and in the event of such delinquencies on the part of the district and/or the collections of construction assessments from such paid-up lands it shall be the duty of the district to refund to the owners of such paid-up lands the construction assessments collected therefrom in excess of the total construction charge pertaining thereto, or so much of said excess as can be paid out of the funds available as soon as there are sufficient funds available in the treasury of the district, and not required to pay the district's obligations to the United States, either under this agreement or other agreement or agreements, or the cost of the operation and maintenance of the transferred works, and the maintenance of the district organization."

The United States is to expend the maximum sum of $150,000 in repairing Derby Diversion Dam and in the enlargement of Truckee Canal. The district is to make payment to the United States in 30 years of the amount expended by the United States in such repair and enlargement work.

The execution of the contract is to be authorized by the electors of the district and confirmed by the courts. This will enable the court to investigate judicially any alleged irregularity connected with the proceedings and to determine in advance if such is the case and the proceedings were regular and the contract valid.

Riverton Project Offers Opportunity

Opening to entry of 40 farm units of public land on the Pavillion division of the Riverton irrigation project in Wyoming, for which water will be available in the irrigation season of 1927, was announced recently at the Interior Department.

The farm units range in size from an irrigable area of 25 acres up to 112 acres. The farm units were originally a part of the Wind River, or Shoshone Indian Reservation, and in addition to the reclamation charges entrymen must pay $1.50 per acre at the local land office in Lander, Wyo. An initial payment of 50 cents per acre must be made at the time of entry and 25 cents per acre each year for four succeeding years.

Applicants for the farm units must also qualify before the Riverton Examining Board as to industry, experience, character, and capital, and must have had at least two years' actual experience in farm work and practice. In addition, each applicant must have at least $2,000 in money free of liability or its equivalent in livestock, farming equipment, or other assets.

Ex-service men of the World War have a preference right of entry until March 3, 1927, provided that they are qualified to make entry under the homestead laws. As the construction charges for the Riverton project have not yet been fixed, irrigation water will be furnished to settlers on these farm units during the irrigation season of 1927 and 1928 at, 1 per acre fo reach irrigable acre of land in the farm unit, which will entitle the entryman to 2 acre-feet of water per acre for each of the irrigation seasons. Additional water will be furnished at the rate of 50 cents per acre-foot.

George Strohm Grows Record Late Potatoes

For many years the idea has prevailed that the soils of the Umatilla project, Oregon, were not well adapted to the growing of late potatoes. Last year George Strohm, one of the successful water users on the project, did very well with a small patch of late potatoes, but many believed it was more or less luck.

This year, in order to prove that he could really grow potatoes, Mr. Strohm planted 1.4 acres to Netted Gems. He dug 59,534 pounds of marketable potatoes, which he sold for $1,041.85, or at the rate of $1.75 per hundred. A yield of 709 bushels per acre is considered remarkable for the project.

Early potatoes are grown on the project with success and some profit, and if there are, as there seem to be, soil adapted to growing late potatoes, production should be encouraged. They would provide an increase in the farmers' income, even though large acreages were not planted to the crop.

The extra yield due to the practice of crop rotation is a profit that may be credited to the managerial ability of the farmer.

Cultivation aids both rotation and fertilization; rotation aids in rendering fertilizers more effective; and fertilizers increase the value of rotation.

Reclamation Project Women and Their Interests

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

Holiday Spirit

WHO doesn't look forward to Christmas Day of all the days of the year? The spirit of the season grips one long before the cherished day arrives. Each and every one of us is thinking of some pleasure we can make for those near and dear to us and for those who have no one to think of them. Home ties are strengthened and we feel happiest when we have made those around us happy.

Like Thanksgiving Day, many a farm home will be the setting for homecomings and family reunions. This is where the housewife plays her most important rôle, and in the hope of being helpful in planning your holiday menus, the following suggestions are given of making the same food you have been preparing during the year a little differently.

Sweet potatoes may be substituted for white potatoes in the make-up of the menu. They have much the same food values as white potatoes, but contain a somewhat larger percentage of sugar and have a higher caloric value.

The general methods of cooking sweet potatoes—baking, boiling, and frying—may be varied almost endlessly by combinations with different seasoning or with other foods. In the North sweet potatoes are for the most part cooked rather simply, while in the South, where the supply is more abundant, they often are candied with various sirups and flavorings and used in making bread, cake, pie, and pudding.

The different ways of frying are just as successful with sweet as with Irish potatoes. Cut into strips, lattices, or chips the raw potatoes may be fried crisp and brown in deep fat; left-over boiled or baked ones may be sliced and sautéed, or they may be mashed, formed into cakes or balls, or mixed with egg for croquettes and fried.

HAM SMOTHERED IN SWEET POTATOES

1 slice smoked ham cut into sizes for serving.
3 cups raw sliced sweet potatoes.
1 tablespoon butter or ham fryings.
2 tablespoons sugar.
1 cup hot water.

Broil the pieces of ham lightly on both sides and arrange them to cover the bottom of the baking dish. Spread the sliced sweet potatoes over them and sprinkle with sugar. Add the hot water and extra fat. Cover the dish and bake slowly until the ham is tender, basting the potatoes occasionally with the gravy. Brown the top well.

SWEET POTATO PIE

1½ cups boiled riced sweet potatoes.
2 tablespoons butter.
¼ cup sugar.
1¾ cups milk.
½ teaspoon ginger.
½ teaspoon salt.
2 eggs.

Mix the above ingredients in the order given and bake in one crust.

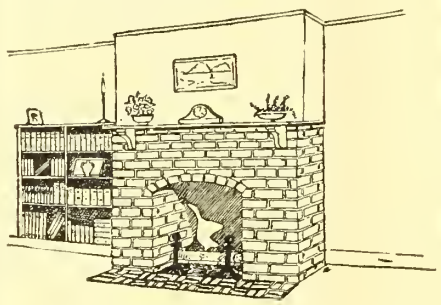
SWEET POTATO PUFF WITH MARSHMALLOWS

To 2 cups of hot riced sweet potatoes add 3 tablespoons of butter, ½ teaspoon salt, pepper to taste, and ½ cup of hot milk. Beat the mixture well. Then beat 2 eggs separately, add yolks to the potato mixture, cut and fold in the stiffly beaten whites. Place the mixture in a buttered baking dish and place a layer of marshmallows close together over the top and brown in a slow oven.

SWEET POTATOES WITH APPLES

3 sweet potatoes.
4 apples.
½ cup sugar.
3 tablespoons butter.
Cold water.

Wash and cook the sweet potatoes in skins. Cook them for 15 minutes in boiling salted water. Cut the potatoes and apples in slices, place them in alternate layers in a buttered baking dish, and sprinkle sugar over each layer. Add a little water and bake until the apples and potatoes are soft.



Chicken Rizotto

From the Italians comes the suggestion for a rice and chicken dish which is both savory and economical. In fact, it is an excellent way of extending the flavor of a small quantity of left-over chicken into a substantial dish for another meal. The carcass of a cold roast fowl or bony pieces left from the first serving of chicken fricassee can be used in this way.

Pick the meat from the bones of the left-over chicken and stew the bones in enough water to make a quart of broth, adding any left-over gravy or sauce that will furnish chicken flavor. In a large skillet cook slowly in two tablespoons of butter an onion which has been minced finely, but do not let the onion brown. To this add the quart of chicken broth, and when it boils up rapidly sprinkle in slowly three-fourths of a cup of rice which has been washed free of surface starch. Cover the skillet, and allow the rice to simmer in the broth for about 25 minutes, or until the grains swell and become soft. Shake the skillet from time to time to keep the rice from sticking, but do not stir it unless absolutely necessary. By the time the rice is done it will have absorbed practically all the broth and the grains will be large and separate. Then add the small pieces of chicken which were picked from the bones, turn the mixture onto a platter, and sprinkle it generously with grated cheese. The Italians use Parmesan cheese, but any of the American varieties hard enough to grate will be satisfactory. Mushrooms, either fresh or canned, are also an excellent addition. This is bound to appeal to American palates.

Fireside Entertainment for Grown-ups and Young

POP CORN

Hand poppers are inexpensive and, if the man of the house is handy, may be made at little or no cost and with very little effort.

For good results in popping, the main requisites are good corn and a hot fire. In popping, certain precautions may be observed to advantage.

Do not take too much pop corn at one time, not more than enough to barely cover the bottom of the popper one kernel deep. Hold the popper high enough above the fire or heat to keep from burning the kernels or scorching them too quickly. The right degree of heat for best results in popping should make good corn begin to pop in 1½ minutes. This should give the maximum volume increase in popping. If it begins to pop in less time or if a large quantity of corn is put into the popper, it will not pop so crisp and flaky. If it takes much longer for the popping to begin, the heat is probably not great enough or the pop corn is of poor quality, or there may be other interfering causes, such as drafts of cold air.

To preserve the snowy whiteness of the popped kernels, the flame should be kept from striking them. This can be done by placing a plate of iron or a stove lid

between the corn and the fire if a wire popper is used or by using a pan popper if popping directly over a flame.

If the pop corn is in first-class condition and the heat properly applied, 1 pint of unpopped corn should give 15 to 20 pints of popped corn.

HOME USES

Pop corn usually is popped to be eaten at once, or it may be made into pop-corn balls, craekajack, or other forms of popeorn eonfection, some good recipes for which follow. A common way of preparing it is by popping and sprinkling it with salt or adding salt and melted butter.

CHOCOLATE POP CORN

2 teacupfuls of white sugar. 2 ounces of chocolate.
½ cup of corn sirup. 1 cup of water.

Put these ingredients into a kettle and cook them until the sirup hardens, when put in cold water. Pour over 4 quarts of crisp, freshly popped corn and stir well to insure the uniform coating of the kernels.

SUGARED POP CORN

Make a sirup by boiling together 2 teacupfuls of granulated sugar and 1 teacup of water. Boil until the sirup strings from the spoon or hardens when dropped in cold water. Pour over 6 quarts of freshly popped corn and stir well.

POP-CORN BALLS

1 pint of sirup. 2 tablespoonfuls butter.
1 pint of sugar. 1 teaspoonful vinegar.

Cook till the sirup hardens when dropped into cold water. Remove to back of stove and add ½ teaspoonful of soda dissolved in a tablespoonful of hot water and then pour the hot sirup over 4 quarts of freshly popped corn, stirring till each kernel is well coated, when it can be molded into balls or into any desired form.

Curtains for the Bedroom

Here are bedroom eurtains that combine daintiness and attractive color along with the essential utility features. Sometimes in the desire to gain an artistic effect the usefulness of curtains is overlooked. All points can be combined in attractive durable curtains. Like everything else, it's all in the knowing how.

The eurtains in this picture, for instance, let in plenty of light and air. The section shirred on rods and attached to the lower sash gives privacy when needed and goes up with the sash when it is raised at night. The straight gathered valance and the straight side draperies are easy to make and hang, and the fabric is a good quality washable marquisette, white with yellow dots. Even though soot and dust settle, their traces can be quickly washed out and the curtains put up looking as fresh as new.

Notice that the side draperies come to the bottom of the "apron" or board that finishes the window casing at the bottom. Also the valance is about one-sixth as long as the draperies.

Attractive corner in a bedroom

These curtains are also in harmony with the other furnishings of the room. Their lines reflect those of the simple painted bookshelves topped with a pair of plain brass candlesticks. The candles are soft yellow to match the dots in the eurtain fabrie and in other accessories of the room.

Co-operation!

What a magic expression!
Open my breast—
There you will find the inscription
Right across my heart in letters of crimson
Engraved CO-OPERATION.

Hark!
You troubled world;
Listen!
Gaze across the continent
From Louisiana to Montana,
From Maine to California;
See beacon lights arising,
Illuminating a new white way,
And from the selfishness and greed of yesterday
Mighty hordes of awakened American producers
Are ushering in the dawn of a new day.

Producers and consumers together,
Marching side by side,
Co-operating with one another
To rid the world of every parasite.

BENJAMIN BROWN,
Director of Sales, Utah Poultry Producers' Cooperative Association, Salt Lake City.

Irrigation Service Regulations for Rio Grande Project

Approved by Department of Interior, November 11, 1926

IN general.—Water is delivered from the Rio Grande Federal irrigation project, pursuant to the provisions of all existing contracts between the United States and the district, of the act of June 17, 1902 (32 Stat. 388) and acts amendatory thereof or supplementary thereto, and of the regulations of the Department of the Interior promulgated thereunder.

Execution of application.—If the application is signed for the owner of the land by some other person, the latter shall immediately furnish evidence satisfactory to the district, of his authority to so execute the application.

Error in application.—The use of irrigation water on any land other than that shown in the application is prohibited, and the right is reserved by the United States to withhold service on this application until correct irrigable area is submitted by landowner. Applicant will pay charges to the district on the basis of the correct area.

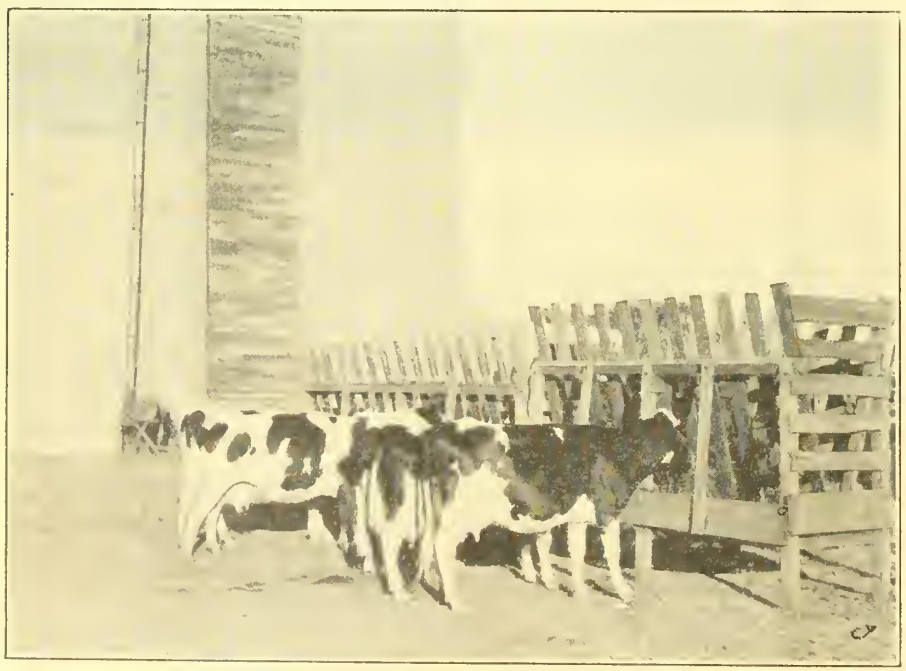
Water charges.—The charges to be paid by the applicant on account of each season, will be announced by the district and will be collected by district levy and assessment, as provided by contract between United States and district.

APPLICATION FOR AND KIND OF SERVICE

Water service outside district.—Owners of lands located outside boundaries of the irrigation district limits will apply to offices of Bureau of Reclamation at Las Cruces, N. Mex. or El Paso, Tex., for special annual water application for irrigation service and irrigation district offices will refer such application to above offices.

Classes of service.—There are two classes of water service, one permanent, the other temporary. Land certified by the United States as subject to the payment of construction charges has a permanent right to the use of water from the project. All other land receives water on a temporary basis. The furnishing of water under this application to land of the latter class shall in no event be construed as a basis for continued delivery or a permanent right, and water may be refused for such lands at the end of any irrigation season.

Ditches to be kept clean.—The ditches of the applicant shall be kept clean and in good condition by the applicant, and upon failure to meet this requirement the United States may refuse the delivery of water until the condition is corrected to the satisfaction of the superintendent of the project. If a community ditch is not kept clean and in good condition, the United States shall have the right either to so refuse the delivery of water or, at its option, to clean the same and charge the cost thereof against the water users thereunder.



Registered Holsteins at the feeding rack, Rio Grande project, New Mexico-Texas

Government to control irrigation works.—The United States shall have full control over all ditches, gates, and other structures required to deliver water, and the superintendent of the project shall have the right, in order to secure economical and efficient service, to establish and enforce such rules in connection therewith as he may deem appropriate.

Operation and maintenance of structures.—In so far as topographic and practical conditions permit, irrigation water for lands directly served by project canals will be delivered through one turnout, or delivery box, for individual tracts of 40 acres or less, the cost of such service being included in the established minimum charge. Should the use of additional turnouts be desired, a charge covering the cost of operating and maintaining such added structures will be made.

DELIVERY AND USE OF WATER

Delivery of water.—Request for water shall be made in writing or by telephone to the proper employee of the Bureau of Reclamation at least 48 hours in advance. Notwithstanding the fact that advance notice is required, the United States reserves the right to deliver all water under similar applications in the order in which requests are received, or follow a plan of rotation approved by the Superintendent of the project until all orders of a given date have been filled. Water will be delivered at the customary place to be there received by the applicant, and conveyed to his land at his expense. In case water is delivered into a community ditch, the water users of the ditch shall appoint an alcalde or superintendent, who will order the required water. When more than one water user is on a sublateral or a community ditch, and request is made for irrigation service for all water users thereon, the amount of water delivered will be prorated among all the water users according to the acreage irrigated or on other basis that will insure efficient delivery and equitable charges. The United States reserves the right to deliver all water under similar applications in the order in which requests are received, or follow a plan of rotation approved by the Superintendent of the project. Water may be refused as long as any district assessment or charge against the land described in the application remains delinquent, or upon failure of applicant to observe any of the requirements of these regulations.

Improper use of water.—The water delivered to an applicant shall not be used on land other than that described in the application, nor shall it be permitted to collect or run upon other land or be wasted in any manner. The running of waste or other water into drainage ditches will not be allowed, except by special permit. Whenever an applicant desires to cease irrigating prior to the termination of the period for which he has ordered water or prior to the completion of an irrigation, he shall notify the Government ditch rider that he is about to discontinue the use of water. If in any such case he turns or permits water to be turned back into the source of supply, all water so released will be charged to the applicant the same as if used until discovered and placed elsewhere. Water users are responsible for water after it has been delivered for their land, either at the land or to sublaterals or other portions of the irrigation system operated by them, and for damage to either irrigation or drainage ditches owned by the United States or to adjoining properties and improvements thereon, due to their carelessness in handling water. Damage to property of the United States caused by improper handling of water by the applicant or his employees must be repaired by the applicant at his own expense, and in case of failure the applicant shall be liable to the United States for the amount of damage.

Water for subdivisions.—Delivery of irrigation water to all portions of subdivided tracts will be contingent upon submission to the project superintendent of a clear written understanding between purchaser and seller as to the rights and conditions of use of existing canals and laterals in order that no portions will be without facilities for water service.

Quantity of water.—The water furnished shall be limited to the quantity which may be used beneficially upon the land described in the application, or such part thereof, to be determined by the superintendent of the project, as shall constitute a proportionate share per acre of the water supply actually available at any time for all of the area being at that time watered from the same source of supply. Water shall be run only during the irrigation season, the limits of which shall be fixed by the boards of directors of the El Paso County water improvement district No. 1 and Elephant Butte irrigation district. In case said boards can not agree the superintendent of the project shall fix the limits.

Leaching water.—Water service for the purpose of flooding lands for the dissolution and removal of alkali will be furnished only to lands which have good drainage and which have been properly prepared by plowing, the construction of borders, and compliance by applicant with such other requirements as may be necessary in the opinion of the Bureau of Reclamation to reclaim the land. The district will issue no contracts for such service until report on conditions is made and approved by Bureau of Reclamation.

WATER SHORTAGE AND WASTE

Shortage of water.—On account of drought, inaccuracy in distribution, or other cause there may occur at times a shortage in the quantity of water provided for herein, and while the United States will use all reasonable means to guard against such shortages, in no event shall any liability accrue against the United States or the district, their officers, agents, or employees, for any damage, direct or indirect, arising therefrom.

Waste and seepage water.—The United States reserves the right to collect for use on said project all waste and seepage water coming from the land described in the application. The applicant releases the United States, its officers, agents, and employees from every claim for damage, direct or indirect, arising by reason of the presence of waste or seepage water on said land.

Water-delivery statements.—Statements of the quantity of water delivered shall be furnished by the United States to each applicant. Any applicant who questions the accuracy of any such statement shall within 30 days notify the Government superintendent of irrigation of his claim, which shall thereupon be promptly investigated and proper adjustment made. Unless such notice is given within the prescribed time no claim for adjustment shall be considered.

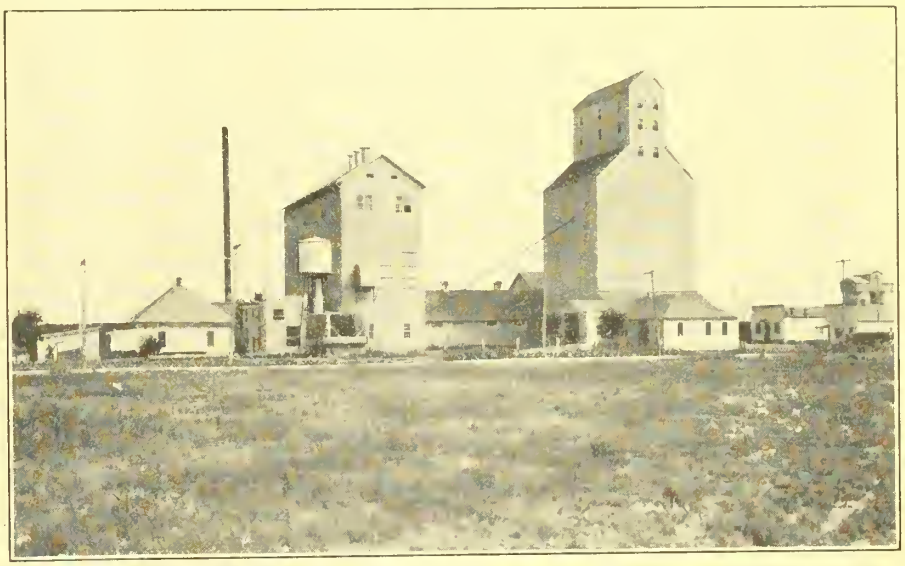
Liens.—A lien in favor of the district for all charges incurred under this application is hereby fixed against the lands described in the application and irrigated by the water so furnished. Said lien may be foreclosed in the manner that other similar liens are foreclosed. This provision is cumulative, and in addition to other remedies now provided by law or otherwise. In case the crop for which water is furnished under this application shall be harvested prior to the time fixed for payment, the entire unpaid amount shall become due and shall be paid within 10 days after the harvesting of such crop and before the removal of the same from the county.

"Winning of the West" Meeting in Los Angeles

A "Winning of the West" conference was held recently in Los Angeles at which representatives were present from the States of Washington, Oregon, Utah, Nevada, California, and New Mexico.

The principal topic of discussion was the necessity for cooperation and for a united front in regard to western reclamation matters. The conference favored immediate and united action by the West in support of the Swing-Johnson bill and consequent development of the Colorado River, as it was declared that the success of the Colorado River development economically and financially would stimulate Federal reclamation work in all parts of the West.

The question of a permanent organization was left in the hands of a committee of which Thomas E. Campbell, former Governor of Arizona, was made chairman.



Flour mill on the Lower Yellowstone project with a daily capacity of 500 barrels

Resolutions Adopted by Sixteenth Annual Oregon Reclamation Congress

Hood River, Oreg., October 16, 1926

BE it resolved, That since we have seen from the State engineer's report that 25 of the 29 projects in Oregon are in a hopeful condition, and that 19 of them are meeting their obligations and payments, and that since we believe from the trend of the settler movement and general agricultural interests of the State, that these interests are at the turning point toward success, we express our confidence and declare our faith in the future and essential importance of reclamation in Oregon and in its solid and intrinsic value. We ask for and challenge cooperation of the best minds in this State, and we pledge the best within us to help work out problems of legislation. We recognize the necessity of accurate evaluation of properties in approaching adjustment of the problems of districts in financial straits. We recognize proper methods of cultivation and production in irrigation and marketing methods as outlined in the state-wide and county agricultural conferences of the Oregon Agricultural College, believing that this will be instrumental in assisting the settler to meet his obligations.

Whereas this congress believes that the potential power resources and available electrical supply to the reclamation projects and other interests of Oregon as superior service at rates as low as may be obtained anywhere else on the Pacific coast, and

Whereas our examination does not indicate that the so-called housewives' bill on the November ballot will serve these purposes; be it

Resolved, That the Oregon Reclamation Congress disapproves the housewives' bill as inimical to reclamation interests.

It having been brought to the attention of this congress by the press of this State that the Secretary of Interior and Commissioner of Reclamation have approved the feasibility of the Owyhee and Vale Oregon projects, and have recommended to the President of United States the expenditure of appropriations of these projects, and have caused the President to certify the expenditure of the aforesaid appropriations, now be it

Resolved, That the Oregon Reclamation Congress here assembled in annual convention does hereby commend and indorse such action and expresses its belief that the care used by the aforesaid officials in recommending these projects has tended to further the cause of reclamation within the State of Oregon and to restore public confidence in Federal reclamation within this State, and we also urge the Secretary of the Interior to proceed with the construction of other Oregon projects.

The Oregon Reclamation Congress is keenly interested in seeing the arid lands of Oregon brought under irrigation.

The Congress of the United States has several times appropriated money for the building of the Baker project, but as yet work on the same has not been started.

It is the desire of this organization, in annual convention assembled, that work on the Baker project be started at once. And therefore be it

Further resolved, That copies of this resolution be sent to the Hon. Hubert Work, Secretary of the Interior, to Hon. Louis C. Crampton, chairman Interior Department Appropriations Committee, to the Oregon delegation in Congress, to the press, and that copy also be spread upon the records of this meeting.

Resolved, That the legislative committee present to the next Legislature of the State of Oregon a bill authorizing the State securities commission to enter into contract with the Secretary of the Interior or any irrigation district organized under State law, to assist the Secretary of the Interior or said irrigation districts in promoting the settlement of the projects or divisions after completion, and in the securing and selecting of settlers; the amount of money to be used for purposes of settlement subject to appropriations in future by the legislature.

Whereas the Deschutes project comprises a body of land of approximately 140,000 acres lying in Jefferson, Crook, and Deschutes Counties.

Whereas this has been investigated by both the State and Federal Governments and found feasible.

Whereas the Deschutes project can be constructed at a reasonably low per acre cost, is in close proximity to markets, has adequate transportation facilities, with a water grade to tide water ports, and the land is all privately owned, and nearly all cleared, and

Whereas it is in the proximity to large timber resources and electrical development: Therefore be it

Resolved, That the Oregon Reclamation Congress indorse this project and urge that the Congress of the United States appropriate funds with which to construct it in the very near future.

On October 16, 1926, the irrigation congress at Hood River, Oreg., adopted the following principles of needed legislation to assist in working out the irrigation district situation in Oregon:

1. That the State be not called upon to assume the liabilities of irrigation districts.

2. That the control of all reclamation matters be vested in the State irrigation and drainage securities commission.

3. That provision be made to prevent pyramiding of taxes so that settlers will be protected and the obligations of each limited to a definite fixed sum.

4. That legislative machinery be provided to permit and encourage the pooling of all interests involved on any project wherein default has occurred, to the end that constructive cooperation may be secured.

5. That such amendments be made to our present irrigation district law in the matter of payment of operation and maintenance charges so that the district's officers may have the option of collecting such charges in advance instead of through the county officers, as now provided, and that they have the further option of denying water to the settlers until such charges are paid, provided that such action will not release the land from the lien of operation and maintenance charges once levied

6. That on any new irrigation district projects which may be undertaken, and on existing projects, as far as possible, assessments should be made in proportion to the benefits to be derived from the water right supplied.

7. That operation and maintenance charges be based upon a fixed charge for the first unit of water supply and an additional charge based on additional quantity of water delivered.

(Continued on page 211)

Progress in Settlement in Victoria, Australia

THE annual report of the State Rivers and Water Supply Commission of Victoria, Australia, gives interesting facts regarding the progress being made in settling their irrigated land. The following paragraphs are quoted from the report:

The number of successful applicants for irrigation blocks during the year was 195. In addition to this, the extension of storages and supply channels has allowed the settlement of some 300 new settlers in districts newly provided with a domestic and stock supply service. The total in the irrigated areas comprised 13 discharged soldiers, 135 civilians, and 47 approved land seekers from overseas. The lands thrown open for settlement totaled 3,940 acres—3,050 acres from lands held in reserve and the balance, 890 acres, from lands purchased during the year.

The placing of 13 discharged soldiers on irrigation farm blocks practically completes this phase of the commission's work of repatriating discharged soldiers. In other respects, however, the work of repatriation is continuous, the commission having undertaken to furnish the soldier settlers not only with advice in irrigated culture, so as to obtain adequate returns for their labor and financial outlay, but also to continue an adequate system of advances for the purchase of stock and carrying out of permanent improvements to their holdings. Altogether 2,181 discharged soldiers have been placed on irrigable blocks. Of this total, 343 obtained their farms under section 20 of the closer settlement act, as explained in previous reports.

With the extension of the Goulburn Channel system, further areas will be made available for intending settlers as required. The commission has in hand for this purpose about 30,000 acres of suitable land, purchased before the construction of the works. Included in this total are some 1,300 acres near Kyabram available for immediate occupation and 10,000 acres at Katandra, which will be served by the East Goulburn Channel, the enlargement and extension of which are now in progress; also about 3,300 acres at Calivil, near the Loddon River. The lands in reserve and temporarily leased also include a balance of about 10,000 acres of the irrigable portion of Red Cliffs Soldier Settlement on the River Murray, 3,000 acres at Maffra partly subdivided, and 3,000 acres of lands at Hallam and Narre Warren, which will be made available for settlement as occasion demands and as soon as the progress of the works permits.

PROGRESS OF IRRIGATED CLOSER SETTLED DISTRICTS

The development of irrigation in all parts of the world is one of slow but sure growth, and although in some countries there has been some slight retrogression on account of the post war slump in markets for agricultural produce, it is gratifying to note that in this country irrigation development has continued to make satisfactory progress.

A striking example of this is noticeable in the Bamawm Closer Settlement Estate in the Rochester district. This estate, which comprises an area of 13,400 acres, was prior to its purchase for closer settlement under irrigation used for cereal growing and sheep raising, and although considered closely settled under dry-farming conditions supported only 21 families. In 1910 this Bamawm area was purchased by the Government and in 1912 subdivided into 180 blocks of an average area of 70 acres. The size of the individual holdings varies with the quality of the soil and ranges from a few acres for workmen's holdings to 200 acres for mixed farming, where the soil is not of the best quality. Almost immediately after settlement, and before the settlers had time to establish themselves, they had to face the dry visitation of 1914–15, which caused them heavy losses. The period 1915–1919 had then to be spent by the settlers in consolidating their position by effecting improvements and raising the quality of their herds. During this period it was necessary for the commission to assist the settlers by advances, while at the same time the arrears of installments due increased, reaching a maximum of £25,000 in 1919. As a set-off, however, the settlers' improvements during this period increased from £42,642 in 1916 to £71,600 in 1919, and since then there has been a steady decrease in the amount owing, while further improvements have been made, making a total value of permanent improvements of £140,412. In addition the settlers' stock and implements bring the total value of their assets to over £275,000. The value of the land has likewise increased by at least a further amount of £100,000. Thus today the settlement is in a very satisfactory condition, as the subjoined figures show.

The stages in the progress made by the district from 1910, when it was used mainly for cereal growing and supported 21 families, and now, when it supports 176 families, are shown by taking the progress at two different periods, 1916 and 1925, thus:

	1916	1925
Land—Purchase money due by settlers	£127,500	£105,960
Advances—Repayments due by settlers	£29,500	£17,568
Value of improvements, stock, implements	£72,758	£275,000
Population	501	1,182
Citrus groves—acres	396	816
Deciduous orchards—do	376	624
Lucerne, cereal, and fodder crops—acres	6,757	11,020
Cattle	769	2,073
Horses	550	670
Sheep	3,274	6,950
Pigs	1,542	8,982
Poultry	3,167	24,000

It will thus be seen that during the past 10 years there has been a most marked increase in the value of assets with a corresponding decrease in amounts owing, and this improvement should be even more pronounced from this on, as settlers begin to get the full benefit of developed orchards and increasing number of stock.

Other irrigation districts which contain a number of soldier and overseas settlers are progressing along similar lines, but because of their more recent settlement are naturally not yet in the same stage of development as those of the somewhat earlier settlers referred to at Bamawm.

In the United States five settlers applied for and secured farm units on three of our reclamation projects. On some projects no public land is available for entry.

Resolutions Adopted By Oregon Reclamation Congress

(Continued from page 210)

8. That the foreclosure of delinquent tax certificates follow the form or practice now followed by the county courts in the foreclosure of delinquent general taxes, to the end that the procedure may be simplified and the cost to the irrigation district lessened.

9. That an immigration department be created for the purpose of assisting in the colonization of all projects, the same to be under the direction of the State engineer, an addition to his department.

The above principles were adopted unanimously by the irrigation congress held sitting as a committee of the whole, and the report of the committee was then adopted by the congress in regular session.

Yakima Orchard Produces Fine Yield

Packing 28,000 boxes of Jonathan apples from the Gilbert Orchard Co. ranch near Harwood, Wash., was completed recently. This tonnage came from 39 acres and represents a yield of 717 boxes an acre. The orchard contains 157 acres, 39 of which are in Jonathans. The owner of the ranch is H. M. Gilbert, president of the Tieton Water Users' Association and one of the successful farmers on the Tieton division of the Yakima project.

Columbia Basin Project to be Studied

IN a report submitted recently to Secretary of the Interior Work a special committee recommends that the agricultural and economic phases of the proposed Columbia Basin project in eastern Washington be studied by selecting six typical tracts of approximately 5,000 acres each. These tracts are typical of the soil conditions, topography, state of development, and climatic conditions of large areas comprising the Columbia Basin project.

The Columbia Basin consists of about 1,750,000 acres of land susceptible of irrigation from the Pend Oreille and Spokane Rivers in the State of Washington.

This proposed project has been investigated by many engineers and groups of engineers. Homer J. Gault, for many years an engineer in the Bureau of Reclamation, was selected with the approval of the Secretary of the Interior to conduct the field work in 1923. His report was submitted in March, 1924. A board of eminent engineers reviewed this report and submitted their findings in February, 1925. Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, and Hon. John H. Edwards, Assistant Secretary of the Interior, reviewed all the reports and came to the conclusion that further information was needed before undertaking such a gigantic scheme. The selection of these tracts and the study of them that is to follow is the initial step in obtaining that information. The report of the special committee appointed for this purpose, comprising Dr. C. L. Waller, vice president, Agricultural College of the State of Washington, Mr. George Severance, professor of farm management, Agricultural College of the State of Washington, Mr. R. K. Tiffany, hydraulic engineer, State of Washington, Mr. A. T. Strahorn, soil surveyor, United States Department of Agriculture, and Mr. George C. Kreutzer, director of reclamation economics, United States Bureau of Reclamation, follows:

The undersigned committee had conferences and inspected the proposed Columbia Basin project in eastern Washington from August 28 to August 30, 1926, inclusive, for the purpose of tentatively selecting three tracts of land of approximately 10,000 acres each which when studied in detail would give economic and agricultural information more or less representative of the project as a whole.

The inspection disclosed a wide variation in soil, topography, and rainfall conditions which affect present and future land utilization. The eastern portion of the project has a more or less uniform soil type, but in the southern portion of this area its surface is rolling to rugged, in the central portion it is smooth, and in the north gently rolling. This large area is generally farmed to wheat and is owned in tracts of from 320 to 640 acres. Some farms are much larger. Two tracts were selected to present typical conditions of this large body of land—one shown on the attached map as No. 5 on rolling to rugged topography and the other shown as No. 2 on the smooth land.

West and north of Pasco is a large body of light soil generally covered with sagebrush. Some of the benches are smooth and some of the lighter soils have a more irregular surface. Very little farming is done in this section because of low rainfall. Tract No. 4 was selected in this vicinity.

In the vicinity of Othello and extending north and south is a large body of more shallow soil. Some is cultivated and some is abandoned. The surface is generally smooth. A study of tract No. 3 will give information on this general type of soil and the questions of ownership and land utilization.

In the general vicinity of Moses Lake is a soil varying from a sandy loam to a loam generally underlain by gravel, cobbles, and bowlders. Irrigation is practiced near the lake by means of pumping. The conditions which apply in this vicinity are typical of a large area and hence tract No. 1 was selected.

In the northwestern portion of the project, in the vicinity of Quincy, the land is smooth and soil similar to tract No. 2, but it is practically all abandoned, no doubt due to the low rainfall. It presents a different problem from tract No. 2, because it has no agriculture. This tract can be studied cheaply because no topographic surveys will be needed. It is shown as tract No. 6.

The committee believes that the final location of these tracts be left until those intrusted with making the investigations can study conditions on the ground. Your committee could only, in the limited time, designate their general locations.

If the size of the tracts is reduced from 10,000 acres to nine sections the cost of the investigations will be similar and can be kept within the allotted funds.

This Lower Yellowstone farmer believes in pure-bred hogs

Damage Claim Allowed

A contract of employment was entered into by the Bureau of Reclamation and C. E. Stone for the hire of a teamster and two horses for use in cutting hay on the Grand Valley project. The team belonged to Miss Anna Ott, who also owned a mower loaned to and used by Stone. The mower driven by Stone clogged and when the team was set to back the mower a clip came off the neckyoke. One of the horses was injured so badly that it died. The Comptroller General found that the injury to the horse was caused by the use of the mower by the United States with knowledge of its defects in connection with the survey, construction, operation and maintenance of the irrigation project. Claim was accordingly allowed. (Comp. Gen. Dec. (A-14693), July 29, 1926, citing 4 Comp. Gen. 713.)

Success in growing hogs depends largely on proper management, which in turn is facilitated by the use of suitable equipment.

Experimental Arch Dam Tests

THE Bureau of Reclamation is cooperating with the Engineering Foundation, which includes the four founder societies of civil, mechanical, mining, and electrical engineers, and the United Engineering Society, in the construction and testing of a concrete arch dam located on Stevenson Creek, a tributary of the San Joaquin River about 60 miles east of Fresno, Calif., which was especially constructed for this purpose.

J. L. Savage, designing engineer in the Denver office of the bureau, is a member of the committee having the testing of this dam in charge for the Engineering Foundation, and Engineer Ivan E. Houk, also of the Denver office, is alternate member of this committee.

The dam as constructed is of a single-arch type with vertical upstream face and constant upstream radius of 100 feet. The gorge in which the dam is constructed is sharply V-shaped in granite rock. The water supply for making the tests is furnished from an outlet of the main supply conduit of the Southern California Edison Co. directly above the dam site.

PURPOSE OF TESTS

The purpose of making these tests on a full-sized structure is to obtain precise information concerning the stresses, movements, and changes of volume of thin arch dams, the theory of which is not in completely satisfactory condition.

Three main values will be measured in connection with the testing of this dam. These are deflection, deformation, or strain, and temperature. The deflection measurements are made from five steel towers 5 feet square, extending the full height of the dam. Deformation is measured by means of 150 Bureau of Standards carbon disk electric telemeters buried in the concrete of the structure. Temperature measurements are made with a coil of wire which will provide an electrical index of the temperature at each telemeter.

DAM TO BE RAISED

As originally contemplated, the dam has been completed to a height of 60 feet, at a cost of $110,000, contributed by about 50 different parties, including bankers, manufacturers, engineers, and power companies. The tests have been made of the dam at the present height of 60 feet, and it is proposed to construct the dam to a total height of 100 feet at an additional outlay of approximately $30,000 in order to complete the tests. The height will be increased gradually by 10-foot intervals until the dam completely gives way under the increasing water pressure.

Already 13 tests have been made of this dam with heights varying successively from 20 to 60 feet, by 10-foot intervals. Many of these tests, especially measurements of the reservoir when empty, were made at night when there was less liability of temperature changes during the long hours required for recording the hundreds of measurements.

The testing staff is now working up the notes of the tests thus far made preparatory to a preliminary report. The experiments have proceeded in a satisfactory manner, and it is believed that much useful knowledge will be assembled that will be of value in the future design of arch concrete dams.

Bolivian Irrigation May Prove Feasible

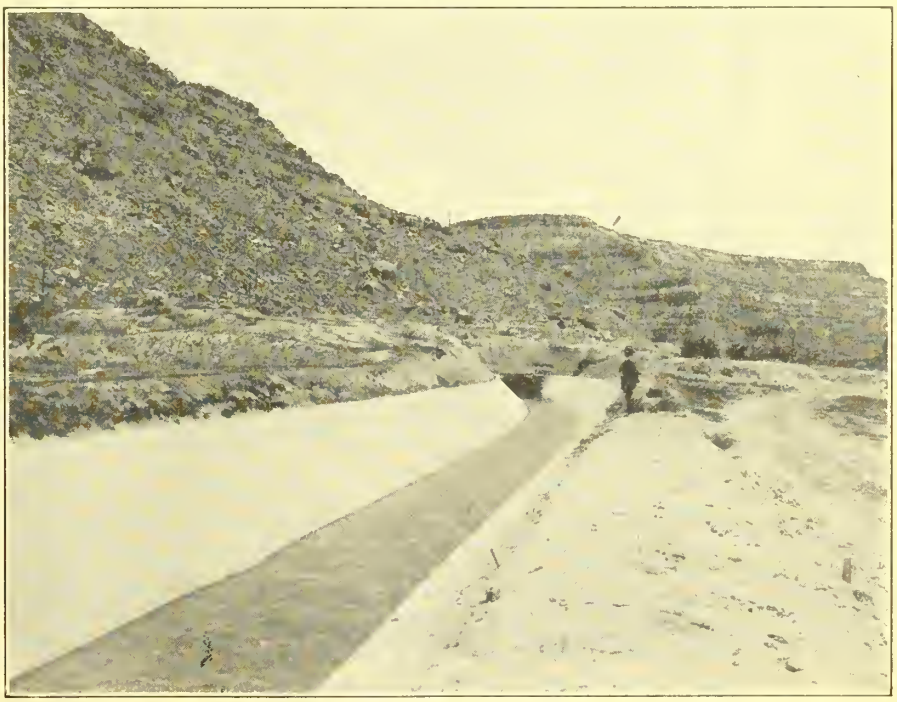
Prof. David Weeks, of the University of California, who was engaged by the Bolivian Government to investigate the possibility of converting the Altiplano, the high plateau region of Bolivia, into desirable farming and grazing land through irrigation, is reported to be optimistic as to the possibility of converting the Altiplano into a desirable region for agricultural settlers. He is quoted as of the opinion that the absence hitherto of available water can be remedied by modern irrigation and that the land can be made as fertile as the best. The one great difficulty appears to be the complete lack of fuel, but it is believed that with the existing resources of water it will be possible to generate sufficient electrical energy to provide the needed heat and power.

Farm Bureau Federation Approves Southern Plan

Commissioner Mead has received a letter from Mr. S. H. Thompson, president of the American Farm Bureau Federation, stating that the board of directors of the federation at a recent meeting indorsed the proposed study by the Bureau of Reclamation of planned rural development in the Southern States.

Good cattle make a basis for good loans. Poor cattle constitute a hazardous proposition for both the producer and the banker who loans the money.

At Yuma the silt content of the Colorado River is estimated to average 7,000 parts per million and the total solid burden to amount yearly to 160,000,000 tons.



Tunnel and lined section of high line canal, Grand Valley project, Colo.

An Apple for Each Season

Learn to pick the right varieties

THE following schedule indicates the right time to use certain varieties of apples:

King David and Winter Banana are the first to go to market. The King David should be eaten in September and early October, while Winter Banana in October or not later than early November. The tonnage of these two varieties is light.

JONATHANS COME FIRST

The first boxed apple that becomes available in quantity in the fall is the Jonathan. It is the apple for the months of September to December. Usually it should go into consumption by the first of the year or not later than February 1. It is a general utility apple that is good for cooking and for eating out of hand.

The Grimes is an apple for November and December and the Stayman should be used in December, January, and February. The season for the Spitzenburg extends from November to January. The White Winter Pearmain is at its best from December to March. The Rome, which is preeminently the best baker, is a good storage apple and is available from November to March.

LONG SEASON FOR DELICIOUS

The season for the Delicious opens in November and extends to March. While it is true that selected lots may be held in cold storage until in May, that is rather too late for the average lots, as there is ordinarily a loss in flavor and crispness when held beyond April 1. However, it is not unusual for it to be held that long.

WINESAPS KEEP WELL

The Winesap may be held the longest in cold storage. It is not unusual for this variety to be in excellent condition, if handled right, in June and July. However, it is desirable to clean up on this variety in May or before the new apples begin to reach the markets. The season extends from January to May. The Arkansas Black has practically the same season as the Winesap. It may be offered from February to May. The Black Twig should be consumed in the months of December to February.

The Newtown is known as a late winter variety, but should not be held as long as the Winesap. It may go on the market from January to April. It is excellent for cooking, baking, and for eating out of hand.

Honey exhibit of H. H. Keck, a water user on the Minidoka project, Idaho

Honey Production on the Minidoka Project

Henry H. Keek, of Paul, Idaho, a water user on the Minidoka project, sends in the accompanying illustration of his honey exhibit at the recent grange fair in Rupert.

Mr. Keek settled on the Minidoka project in 1904 and was one of the first beekeepers on the project, going into the business in 1910. He has had bees ever since, and states that the bee industry on the project is coming to the front more and more every year.

The honey flow this year was good, but short, owing to the dry season. However, from about 400 colonies Mr. Keek produced a carload of good, heavy bodied, water-white honey.

His exhibit was designed to show the varied uses of honey as food in the home, for cakes, candy, cookies, doughnuts, jellies of all kinds, preserves, and canned fruit. No sugar was used in any of his exhibit material.

The color scheme of his exhibit was canary yellow and white, with natural fresh sweet clover, red clover, and alfalfa blossoms at the corners of the booth and about the base.

Organization Activities and Project Visitors

DR. ELWOOD MEAD, Commissioner of Reclamation, is planning to accompany the Commission on Reclamation and Rural Development on its trip in December to study selected properties in six Southern States.

George C. Kreutzer, Director of Reclamation Economics, has returned to his headquarters in Washington, D. C.

Sr. Ludovico Ivanissevich, civil engineer, chief of the zone of Cuyo and sanitary officer for the Republic of Argentina, was a recent visitor at the Denver office to obtain information concerning the irrigation projects. He plans to visit American Falls Dam and the Salt River and Rio Grande projects.

S. W. Nicholdsen, senior engineer of the irrigation service of Punjab, India, spent several days in the Denver office after his inspection of a number of the irrigation projects.

Thomas R. Smith, junior engineer, has been transferred from American Falls Dam to the Denver office.

C. H. Pease has resigned as secretary-manager of the Lower Rio Grande Water Users Association. He has been employed by Cameron County to represent the interests of the Delta before the department and before Congress in Washington in the matter of insuring permanent water rights on the Rio Grande through a treaty with Mexico and effective river control. Mr. W. W. Houser, the present president of the association, will fill both positions of president and secretary-manager until a suitable candidate can be found as successor to Mr. Pease.

J. B. Bond, manager of the Boise project, has resigned to accept a position with the J. G. White Co. in Mexico. He is suceeeded by William H. Tuller, former assistant manager. Frank J. Hanagan, treasurer of the project, has been elected secretary as well, taking over the duties of C. R. Kollerborn, who has resigned.

W. L. Whittemore, superintendent of the Strawberry Valley project, has resigned to accept a position with the State of Tennessee on hydraulic investigations and development. Kenneth Borg, senior hydrographer, has been designated acting superintendent until the project is turned over to the water users' assoeiation.

Lorenzo Lepori, civil engineer of the Argentine Republic, has been visiting a number of the projects.

Stan Spacek, engineer of the Czechoslovakian Government, visited a number of the irrigation projects recently after completing the installation of the Czechoslovakian building at the Sesquicentennial Exposition in Philadelphia.

F. S. Replogle has been appointed as senior engineering draftsman in the Denver office by transfer from the Department of Agriculture.

L. H. Benster, assistant engineer, has resigned his position in the designing section of the Denver office.

C. C. Elder, assistant engineer, has continued his hydrographic work on the Rio Grande and tributaries between Embudo and San Marcial, N. Mex., making stream-flow measurements, collecting silt samples, installing and reading drainage wells, and conducting evaporation measurements.

Colonel Jackson, Major Finch, and Major Arthur, Army engineers, visited the Yuma project recently in connection with a study of protection work on the lower Colorado.

Superintendent W. G. Elliott, of the Ambursen Dam Co., arrived at the Stony Gorge Dam site, Orland project, during the latter part of October to plan the early erection of a construction camp. Other visitors to the dam site included S. O. Harper, general superintendent of construction; J. L. Savage, designing engineer; and S. W. Stewart, president; E. W. Burroughs and L. A. Robb, vice presidents; and Office Engineer Rockwell, of the Ambursen Dam Co.

W. W. Snyder, drag-line operator, has been transferred from the Grand Valley project to the Newlands project to operate a drag line on drainage excavation.

Prof. Duff A. Abrams, director of research department of the United States Portland Cement Association, Chicago, and F. H. Richardson, W. B. Cheek, and Dr. R. H. Bogue, of the same association, with headquarters at Salt Lake City, Denver, and Washington, D. C., respectively, spent several days on the Uncompahgre project making the annual examination of the concrete blocks at the North Mesa siphon seep bed.

M. C. Cutting, feature writer for the Country Gentleman, was a recent visitor on the Minidoka project.

Edwin L. Rose, electrical engineer, and C. J. Moody, project manager, Flathead (Indian) project, have been gathering data on the Minidoka project concerning rural distribution of electrical energy to water users.

Herman Krueger and C. H. Davis, of the Shoshone project, and J. B. Lamson and Val Kuska, agricultural development agents, of the Chicago, Burlington & Quincy Railroad, spent several days in the Washington office in connection with the negotiation of a contract with the Deaver irrigation district for repayment on a crop-production basis.

A. C. Cooley and O. F. Cook, of the Department of Agriculture, held a conference recently on the Rio Grande project with project, irrigation district, and agricultural college officials on the proposed farm and crop survey of the project.

J. L. Savage, designing engineer, has been making experiments on the Klamath project to determine a satisfactory method of finishing gunite lining.

Messrs. Partridge and MacBean, of the California-Oregon Power Co., held a conference recently with Hydrographer H. K. Smith, of the Klamath project, in regard to a proposed snow survey of the Upper Klamath Lake watershed.

An exhibit of choice apples on the Uncompahgre project, Colorado

R. E. Pratt, representing the Utah-Idaho Sugar Co., has been looking over the Belle Fourche project to determine its suitability for the establishment of a sugar factory.

W. G. Harper, of the Department of Agriculture, who has been assisting on the soil survey in the lower valley, Yakima project, has been transferred to work in Utah.

P. C. Vilander, timekeeper and cost keeper on the Shoshone project, has resigned to accept a position as instructor at the State Agricultural College at Manhattan, Kans.

H. F. McPhail, engineer in the Denver office, has been making an inspection of the power system and assisting in locating and remedying trouble at the Deaver substation, Shoshone project.

H. M. Schilling, superintendent of the Umatilla project, Oregon, has been assigned as superintendent of the Huntley project, Montana, to succeed A. R. McGinness, superintendent, who has resigned to take effect early in December.

Hon. W. G. Swendsen, Commissioner of Reclamation of Idaho, has resigned to accept a position with the Amalgamated Sugar Co. His resignation has been accepted with regret by Governor Moore.

Utah Water Commission Lauds Engineer Green

The special committee of the Utah Water Storage Commission has written a letter to Engineer William M. Green, who recently resigned from the bureau, expressing appreciation of his services and regret at his resignation. Copy of the letter was sent to Commissioner Mead and is printed below:

Having been specially designated for that purpose, it is our privilege to record the deep and lasting regret of the Utah Water Storage Commission at the loss it is sustaining in your severing your connection with the United States Bureau of Reclamation.

The close association which the commission has enjoyed with you the past few years in working on Utah's water problems has given all its members a high regard for your technical ability, sincerity of purpose, and constant zeal in cooperating with it in every way in your power. Brought into close contact with you under circumstances which might at times have led to friction, we have experienced none of the petty differences which could so easily arise, and we have been met on all occasions with the broadmindedness of wide knowledge and the unfailing courtesy of a gentleman.

We realize the promise of your new connection justifies the severing of the old, and our best wishes for your full success go with you into your new field. As a group of individuals the commission asks your acceptance of a small visible token of its appreciation of the association now ending. We also desire to let Doctor Mead have a copy of this letter.

With kindest personal regards,

Very sincerely,

W. W. Armstrong.
Richard R. Lyman.
Geo. M. Bacon.

Southern Planned Rural Development

A CONFERENCE to discuss plans for the investigation of unoccupied, unsettled, and abandoned lands in the South with the view of reclaiming them through settlement was held in the Office of the Secretary of the Interior recently.

Secretary Work presided over the meeting, which was attended by a number of Senators from southern States, leading officials of railroads, and several prominent settlement experts of the South.

Congress recently authorized the expenditure of $100,000 for the investigation into the development of areas of unsettled lands, and $15,000 of this amount was appropriated for expenditure during the present fiscal year. Methods to be adopted by the Reclamation Bureau of the Interior Department in conducting these investigations were the subjects under discussion.

Commissioner Elwood Mead, of the Reclamation Bureau, stated at the conference that as a result of cooperation on the part of southern States six typical areas have been selected by them in different sections of the South to be studied with a view of developing a comprehensive and definite Federal policy to be reported to Congress. Senators from southern States, railroad officials, and other settlement experts present at the conference gave their approval of the plans outlined by the bureau.

Those present at the conference included: Senator Overman, of North Carolina; Senator Tyson, of Tennessee; Senator Harris, of Georgia; Howard Elliott, chairman of the Northern Pacific Railroad; Lincoln Green, assistant to the president of the Southern Railroad; W. P. Kenly, vice president of the Atlantic Coast Line Railroad; Daniel C. Roper, of South Carolina, former Commissioner of Internal Revenue; Hugh MacRae, of Wilmington, N. C., founder of the experimental colonies of Castles Haynes and St. Helena in North Carolina; Copley Amory, expert in reclamation economics of the Bureau of Reclamation; and George C. Kreutzer, director of reclamation economics.

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Project	Office	Superintendent	Chief clerk	Fiscal agent	District counsel	
					Name	Office
Belle Fourche	Newell, S. Dak.	F. C. Younghlutt	R. C. Walher	R. C. Walher	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. 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. 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.
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	W. L. Whittemore	H. R. Pasewalk	H. R. Pasewalk	J. R. Alexander	Montrose, Colo.
Sun River	Fairfield, Mont.	G. O. Sanford	H. W. Johnson	F. C. Lewis	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.
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.
Umatilla, McKay Dam	McKay Dam, Oreg.	R. M. Conner [6]			B. E. Stoutemyer	Portland, Oreg.
Kittitas	Ellensburg, Wash.	Walker R. Young [6]	E. R. Mills		do	Do.
Sun River, Gibson Dam	Augusta, Mont.	Ralph Lowry [6]			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	
Owyhee	Boise, Idaho	R. J. Newell	
Vale	do	do	
Payette division, Boise	do	do	
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.

Hampshire ewes and lambs on sweet clover pasture, Belle Fourche project, South Dakota