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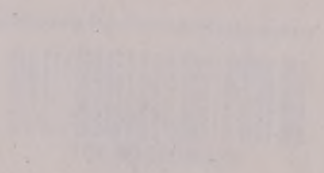
PROCEEDINGS
NINETEENTH
NATIONAL IRRIGATION
CONGRESS

HELD AT CHICAGO, ILLINOIS, U.S.A.
FROM SEPTEMBER 24, 1911



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OFFICIAL PROCEEDINGS

OF THE

NINETEENTH
NATIONAL IRRIGATION
CONGRESS

HELD AT CHICAGO, ILLINOIS, U. S. A.
DECEMBER 5-9, 1911

EDITED BY ARTHUR HOOKER
SATTERLEE AND BINNS, OFFICIAL REPORTERS

F. No. 26786



CHICAGO

R. R. DONNELLEY & SONS COMPANY

1912



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Alc. Nr. 3684/51

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OFFICERS
of_the
Nineteenth National Irrigation Congress

- B. A. FOWLER.....President
Phoenix, Arizona.
- FRED W. FLEMING.....First Vice-President
Kansas City, Missouri.
- L. NEWMAN.....Second Vice-President
Great Falls, Montana.
- A. G. WATSON.....Third Vice-President
Pueblo, Colorado.
- JOHN FAIRWEATHER.....Fourth Vice-President
Fresno, California.
- B. C. BUFFUM.....Fifth Vice-President
Worland, Wyoming.
- R. INSINGER.....Chairman Executive Committee
Spokane, Washington.
- ARTHUR HOOKER.....Secretary
Spokane, Washington.
- DR. E. McQUEEN GRAY.....Foreign Secretary
Albuquerque, New Mexico.
- AUGUST WOLF.....Director of Publicity
Spokane, Washington.

Board of Governors

R. INSINGER, Chairman.	R. R. McCORMICK.
B. A. FOWLER, Vice-Chairman.	W. G. DeCELLE.
ARTHUR HOOKER, Secretary.	W. S. HOPEWELL.
Dr. W J McGEE.	

Executive Committee

Nineteenth National Irrigation Congress.

Arizona	Jos. H. Kibbey	Phoenix
Arkansas	George Sengel	Fort Smith
California	John S. Dore	Fresno
Colorado	W. A. Insinger	Greeley
Connecticut	Miss F. D. Sanford	Derby
Dist. of Columbia	W J McGee	Washington
Florida	Thomas M. Wier	Tampa
Idaho	D. H. Bark	Boise
Hawaii	Ralph S. Hosmer	Honolulu
Illinois	W. G. DeCelle	Chicago
Kansas	R. H. Faxon	Garden City
Louisiana	W. B. Gregory	New Orleans
Minnesota	John T. Stewart	St. Paul
Mississippi	Kurt Grunwald	Hattiesburg
Missouri	F. L. Vandegrift	Kansas City
Montana	David Graham	Belt
Nebraska	D. D. Price	Lincoln
Nevada	G. S. Nixon	Reno
New Hampshire	Edward Percy Stoddard	Portsmouth
New Mexico	W. S. Hopewell	Albuquerque
New York	H. J. Aldrich	Gouverneur
North Carolina	Joseph Hyde Pratt	Chapel Hill
Ohio	E. F. Bohm	Cleveland
Oklahoma	Harper S. Cunningham	Guthrie
Oregon	D. M. Brogan	Brogan
South Carolina	E. J. Watson	Columbia
South Dakota	Samuel H. Lea	Pierre
Texas	J. A. Smith	El Paso
Utah	F. A. Druehl	Salt Lake City
Washington	R. Insinger	Spokane
Wisconsin	Alvin P. Kletzsch	Milwaukee
Wyoming	Thomas Cosgriff	Cheyenne

Honorary Vice Presidents

Nineteenth National Irrigation Congress.

Arizona	John Orme	Phoenix
Arkansas	W. C. Johnston	Fort Smith
California	F. C. Finkle	Los Angeles
Colorado	F. C. Goudy	Denver
Connecticut	F. Coe	Middletown
Dist. of Columbia	F. H. Newell	Washington
Florida	A. W. Gilchrist	Tallahassee
Idaho	F. R. Gooding	Gooding
Hawaii	Walter F. Frear	Honolulu
Illinois	E. T. Perkins	Chicago
Kansas	E. H. Webster	Manhattan
Louisiana	F. C. Quereau	Crowley
Minnesota	E. M. Freeman	St. Paul
Mississippi	T. S. Jackson	Hattiesburg
Missouri	J. N. Anderson	St. Louis
Montana	E. L. Norris	Helena
Nebraska	W. E. Guthrie	Omaha
Nevada	F. G. Newlands	Reno
New Hampshire	O. L. Frisbee	Portsmouth
New Mexico	F. A. Hubbell	Albuquerque
New York	Norman E. Webster, Jr.	New York
North Carolina	Joseph G. Brown	Chadbourn
Ohio	Judson A. Harmon	Columbus
Oklahoma	John Fields	Oklahoma City
Oregon	Will R. King	Portland
South Carolina	Samuel G. Stoney	Charleston
South Dakota	R. S. Vessey	Pierre
Texas	Avery Turner	Amarillo
Utah	John Henry Smith	Salt Lake City
Washington	W. T. Clark	Wenatchee
Wisconsin	J. H. Stout	Menomonie
Wyoming	Bryant B. Brooks	Cheyenne

CHICAGO BOARD OF CONTROL

Nineteenth National Irrigation Congress.

Robert R. McCormick, Chairman, Attorney-at-Law.
W. L. Park, Vice-Chairman, V.-P. Illinois Central.
Arthur Hooker, Secretary.
Harvey C. Vernon, Treasurer, Asst. Cash. Cont. & Comml. Nat. Bank.

COMMITTEE ON FOREIGN REPRESENTATION.

Evans, Dr. W. A., Chairman, Ex-Health Com'r of Chicago.
Allen, Henry A., Consulting Engineer.
Anderson, Bishop C. P., Diocese of Chicago.
Austin, F. C., Pres. Municipal Engineering & Contracting Company.
Bennett, Frank I., Pres. Bitter Root Valley Irrigation Co.
Fallows, Bishop Samuel, Reformed Episcopal Church.
Hibbard, John D., Pres. North American Securities Co.
Knight, Thomas D., Attorney.
MacVeagh, Franklin, Secretary of the Treasury.
Miller, Walter E., 1st V.-P. Fairbanks, Morse & Co.
Porter, George F., Capitalist.
Revell, Alexander H., Pres. Alexander H. Revell & Co.
Roulston, R. J., Pres. Board of Directors, Chicago Public Library.
Shepardson, Francis W., University of Chicago.
Turck, Dr. Fenton B., Physician.
Vaughan, J. C., Pres. Vaughan's Seed Store.
Voorhees, D. W., Peoria, Ill.
Vopicka, Charles J., Pres. Atlas Brewing Co.

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Arnold, Bion J., Consulting Engineer.
Baker, Alfred L., Banker and Broker.
Bogert, Wm. B., Bogert, Maltby & Co.
Buel, Munson P., Pres. Evans, Snider, Buel Co.
Clow, H. B., Pres. Rand, McNally & Co.
Fisher, Walter L., Secretary of the Interior.
Hagar, Edward M., Pres. Universal Portland Cement Co.
Hunt, Robert W., Robert W. Hunt & Co., Engineers.
Kelly, George Thomas, Master in Chancery.
Knight, Frank B., Lidgerwood Mfg. Co.
Lansing, R. U., Mgr. Bond Dept. Nat'l City Bank.
McMullin, Frank R., F. R. McMullin & Co.
Mark, Clayton, V. P. National Malleable Castings Co.
Morton, Joy, Pres. Great Western Cereal Co.
Riley, Harrison B., Pres. Chicago Title & Trust Co.
Ringley, Fred J., Pres. The Fred J. Ringley Co.
Wood, Henry C., Attorney.

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 Dixon, George W., Sec. Arthur Dixon Transfer Co.
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 Lydon, William A., Pres. Great Lakes Dredge & Dock Co.
 Manss, William H., McKinney, Hodge & Manss.
 Mudge, H. U., Pres. Rock Island Railway.
 Nicholson, Geo. T., V. P. Santa Fe Railway.
 Patterson, L. B., V. P. Nat'l Packing Co.
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 Stillwell, Homer A., Butler Brothers.
 Upham, Fred W., Pres. City Fuel Co.
 Wallace, H. U., Consulting Engineer.

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 Kaufmann, N. M., Pres. Congress Hotel Co.
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 Eastman, Sidney C., Master in Chancery.

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Hall, Richard C., Pres. Duck Brand Co.
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Lane, Francis M., Editor Nat'l Land & Irrigation Journal.
Letts, Frank C., Pres. Booth Fisheries.
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Shamel, Clarence A., Editor Orange Judd Farmer.
Smith, Willard A., Pres. The Railway & Engineering Review.

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Lansing, R. U., Vice-Chairman, Mgr. Bond Dept. National City Bank.
Alden, G. W., Mgr. McMyler Interstate Co.
Arnold, Bion J., Consulting Engineer.
Austin, F. C., Pres. Municipal Engineering & Contracting Co.
Baker, Alfred L., Banker and Broker.
Bennett, Frank I., Pres. Bitter Root Valley Irrigation Co.
Dixon, Geo. W., Sec. Arthur Dixon Transfer Co.
Evans, Dr. W. A., Ex-Health Commissioner of Chicago.
Falkenau, Victor, Pres. Falkenau Construction Co.
Hagar, Edward M., Pres. Universal Portland Cement Co.
Hibbard, John D., Pres. North American Securities Co.
Johnson, Jas. W., General Electric Co.
Kaufmann, N. M., Pres. Congress Hotel Co.
Knight, Frank B., Lidgerwood Manufacturing Co.
Loeb, Albert H., Treas. Sears, Roebuck & Co.
Lydon, Wm. A., Pres. Great Lakes Dredge & Dock Co.
Manss, W. H., McKinney, Hodge & Manss.
Mark, Clayton, Vice-Pres. National Malleable Castings Co.
Nicholson, Geo. T., Vice-Pres. Santa Fe Railroad.
Park, W. L., Vice-Pres. Illinois Central.
Patterson, L. B., Vice-Pres. National Packing Co.
Perkins, E. T., Pres. Edmund T. Perkins Engineering Co.
Powers, Harry J., Proprietor Powers' Theater.
Randolph, Isham, Consulting Engineer.
Revell, A. H., Pres. Alexander H. Revell & Co.
Scott, F. E., Union Ticket Offices.
Sunny, B. E., Pres. Chicago Telephone Co.
Thorne, C. H., Montgomery Ward & Co.
Upham, Fred W., Pres. City Fuel Co.
Vopicka, Charles J., Pres. Atlas Brewing Co.

MEETING PLACES AND LIST OF OFFICERS

of the

NATIONAL IRRIGATION CONGRESSES—1891-1912

First Congress—1891. September 15—17.

Place.	Officers.
Salt Lake City, Utah..	C. C. Wright, California.....President Gov. Arthur L. Thomas, Utah....Ch. Ex. Com. Wm. E. Smythe, San Diego, Cal.....Secretary

1892.

No meeting of the Congress.

Second Congress—1893.

Los Angeles, Cal.....	J. S. Emery, Lawrence, Kan.....President Wm. E. Smythe, San Diego, Cal..Ch. Ex. Com. Fred L. Alles, Los Angeles, Cal.....Secretary
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Third Congress—1894.

Denver, Colo.....	Elwood Mead, Cheyenne, Wyo.....President Wm. E. Smythe, San Diego, Cal..Ch. Ex. Com. Fred L. Alles, Los Angeles, Cal.....Secretary
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Fourth Congress—1895.

Aibquerque, N. Mex..	Geo. L. Cannon, Salt Lake City, Utah....Pres. E. R. Moses, Great Bend, Kan....Ch. Ex. Com. Fred L. Alles, Los Angeles, Cal.....Secretary
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Fifth Congress—1896.

Phoenix, Ariz.....	C. B. Boothe, Los Angeles, Cal.....President E. R. Moses, Great Bend, Kan..Ch. Ex. Com. Jas. H. McClintock, Phoenix, Ariz....Secretary
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Sixth Congress—1897.

Lincoln, Neb..... (No Proceedings Printed.)	C. B. Boothe, Los Angeles, Cal.....President E. R. Moses, Great Bend, Kan....Ch. Ex. Com. F. J. Mills, Boise, Idaho.....Secretary
---	---

Seventh Congress—1898.

Cheyenne, Wyo.....	Jos. M. Carey, Cheyenne, Wyo.....President Jos. M. Carey, Cheyenne, Wyo...Ch. Ex. Com. O. E. McCutcheon, Saginaw, Mich...Secretary
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Eighth Congress—1899.

Missoula, Mont.....	Dr. S. B. Young, Salt Lake City, Utah....Pres. C. B. Boothe, Los Angeles, Cal..Ch. Ex. Com. H. B. Maxson, Reno, Nev.....Secretary
---------------------	---

Ninth Congress—1900.**November 21—24.**

Chicago, Ill.....	Elwood Mead, Cheyenne, Wyo.....	President
	Geo. H. Maxwell, Chicago, Ill.....	Ch. Ex. Com.
	H. B. Maxson, Reno, Nev.....	Secretary

1901.

Buffalo and Colorado Springs selected. No Congress held at either place.

Tenth Congress—1902.

Colorado Springs, Colo.	Thos. F. Walsh, Washington, D. C....	President
	C. E. Wantland, Denver, Colo.....	Ch. Ex. Com.
	H. B. Maxson, Reno, Nev.....	Secretary

Eleventh Congress—1903.**September 15—18.**

Ogden, Utah	W. A. Clark, Butte, Mont.....	President
	Fred J. Kiesel, Ogden, Utah.....	Ch. Ex. Com.
	H. B. Maxson, Reno, Nev.....	Secretary

Twelfth Congress—1904.

El Paso, Texas.....	W. A. Clark, Butte, Mont.....	President
	C. B. Boothe, Los Angeles, Cal....	Ch. Ex. Com.
	A. W. Gifford, El Paso, Texas.....	Secretary

Thirteenth Congress—1905.

Portland, Ore.....	Gov. Geo. C. Pardee, Oakland, Cal....	President
	C. B. Boothe, Los Angeles, Cal..	Ch. Ex. Com.
	Tom Richardson, Portland, Ore.....	Secretary

Fourteenth Congress—1906.**September 3—8.**

Boise, Idaho	Gov. Geo. C. Pardee, Oakland, Cal....	President
	Montie B. Gwinn, Boise, Idaho....	Ch. Ex. Com.
	H. B. Maxson, Reno, Nev.....	Secretary

Fifteenth Congress—1907.**September 2—7**

Sacramento, Cal.....	Gov. Geo. Chamberlain, Portland, Ore....	Pres.
	W. A. Beard, Sacramento, Cal....	Ch. Ex. Com.
	D. H. Anderson, Chicago, Ill.....	Secretary

Sixteenth Congress—1908.**September 29—October 3.**

Albuquerque, N. Mex...	F. C. Goudy, Denver, Colo.....	President
	F. C. Goudy, Denver, Colo.....	Ch. Ex. Com.
	B. A. Fowler, Phoenix, Ariz.....	Secretary

Seventeenth Congress—1909.**August 9—14.**

Spokane, Wash.....	Geo. E. Barstow, Barstow, Texas....	President
	W. A. Beard, Sacramento, Cal....	Ch. Bd. Gov.
	B. A. Fowler, Phoenix, Ariz.....	Secretary

Eighteenth Congress—1910.**September 26—30.**

Pueblo, Colo..... B. A. Fowler, Phoenix, Ariz.....President
 R. Insinger, Spokane, Wash.....Ch. Bd. Gov.
 Arthur Hooker, Spokane, Wash.....Secretary

Nineteenth Congress—1911.**December 5—9.**

Chicago, Ill.....B. A. Fowler, Phoenix, Ariz.....President
 R. Insinger, Spokane, Wash.....Ch. Bd. Gov.
 Arthur Hooker, Spokane, Wash.....Secretary

Place and Officers Selected for the Twentieth Congress—1912.

Salt Lake City, Utah..Francis G. Newlands, Reno, Nev.....President
 R. W. Young, Salt Lake City, Utah Ch. Ex. Com.
 Arthur Hooker, Spokane, Wash.....Secretary
 Congress Address, Salt Lake City, Utah.

OFFICIAL CALL

NINETEENTH NATIONAL IRRIGATION CONGRESS

To the People of the United States, Greeting:

The National Irrigation Congress will hold its nineteenth session in Chicago, Illinois, U.S.A., December 5-9, 1911.

Place of Meeting.

It is fitting that this great agricultural and industrial development agency should at this time hold a great meeting in Chicago, one of the world's most important industrial and commercial centers. The lands available for private settlement, long thought unlimited, are practically exhausted, so that continued extension of settlement must depend on the reclamation of land by control of the water supply; and Chicago is the clearing-house for the western country involved in the new era of land development.

The peculiar fitness of Chicago for this meeting inspired the invitation and actuates a strong Board of Control who have undertaken to make the nineteenth meeting of the National Irrigation Congress the most successful in its history.

Here where East and West meet the Congress will point with pride to that empire-building which made the "Great American Desert" a country of happy homes and of bounteous productivity.

To the landless and homeless the Congress will bring glad tidings of opportunity for lands and homes on the millions of acres reclaimed under the spirit awakened by western irrigation.

Never more important than now, when the population of the country is so rapidly increasing, were the objects of the Congress, expressed in its motto, "Save the forests, store the floods, reclaim the deserts, make homes on the land."

Personnel.

The personnel of the National Irrigation Congress will be as follows:

The officers of the Congress.

The President of the United States.

The Vice-President of the United States.

The members of the Cabinet.

Members of the United States Senate and House of Representatives.

Governors of States, Territories, and Insular Possessions of the United States.

Members of Federal, State, Territorial, and Insular Irrigation, Water and Conservation Commissions.

State Engineers and Commissioners of Agriculture and Horticulture.

The Mayor of each city or town having a population of over one thousand.

Chairmen of general and special committees.

All permanent delegates of the Congress.

Delegates appointed under the provisions of the constitution as follows:

Delegates.

Fifteen Delegates appointed by the Governor of each State or Territory.

Ten Delegates appointed by the Mayor of each city of the United States of more than twenty-five thousand population.

Five Delegates appointed by the Mayor of each city in the United States of less than twenty-five thousand population and over one thousand.

Five Delegates appointed by the chairman of each Board of County Commissioners or County Supervisors in the United States.

Two Delegates appointed by the Mayor from each incorporated town having a population of less than one thousand.

Two Delegates duly accredited by each regularly organized association devoted to Irrigation, Agriculture, Horticulture, and Engineering.

Two Delegates regularly accredited from each College and University.

Two Delegates duly accredited by each Chamber of Commerce, Board of Trade or Commercial Club.

Early Action Important.

Appointment of delegates should be made early as possible to facilitate the organization of state delegations. Notices of appointment giving full name, post-office address, and occupation of each delegate should be forwarded to the Secretary of the National Irrigation Congress at Chicago.

Permanent Delegates.

While the policy of the Congress is shaped at each session by the state delegations the continuity of the organization and the efficiency of its work are influenced largely by the Permanent Delegates provided for by Article VI., Section 2, of the Constitution; and members interested in the permanency of the Congress are earnestly invited to become Permanent Delegates.

Foreign Representatives.

All foreign governments have been invited to send representatives to the Congress. The hearty responses from foreign governments at previous congresses have made the foreign representation an important feature of the organization. The increasing interest promises large representation this year.

Visitors.

The presence of visitors, including ladies, is specially appreciated, and their attendance is encouraged.

Addresses.

The Program will include addresses and papers by:

Experts in Irrigation, Drainage, and Forestry.

Foreign Delegates.

Governors of States and Territories.

Senators and Representatives in the Federal Congress.

Public officials and eminent citizens.

Statesmen and scientists.

Industrial and financial leaders.

Officials of Federal and State Irrigation projects.

Officials of private irrigation enterprises.

Leaders in drainage reclamation.

Discussion.

It is planned to make this a practical, live Congress, and to secure the desired results from the consideration and discussion of the questions in which the Delegates are interested, it is necessary that the

Delegates come prepared to discuss briefly and to the point the questions which come before the Congress. Discussion is an important factor of the program, and will be encouraged.

Governors' Session.

The Governor of each State and Territory in the Union, together with his staff, has been invited to be present on Governors' Day, for which a session of the Congress will be set apart.

Special Features.

No previous Congress has offered the many opportunities afforded by the coming nineteenth meeting.

Chicago is the center of a vast territory with millions of people "land hungry" and eager to learn of opportunities to secure homes on the land.

The Congress will tell of the wonders accomplished through reclamation and the great work remaining to be done. Ocular demonstration of the truth will be found at the United States Land and Irrigation Exposition at the Coliseum, November 18th to December 9th.

Provision has been made for giving exceptional attention to drainage, both in connection with irrigation projects and for the reclamation of swamp and overflow lands in the humid as well as in the more arid portions of the country.

The International Live Stock Exposition will be held December 2d to 9th.

The Chicago Grand Opera will delight and entertain the music lovers.

The great city will be in holiday attire in fitting celebration of the wonders accomplished through the Chicago spirit "I Will."

Railway Rates.

Delegates should notice particularly the opportunity this trip will give to visit numerous places of national interest. Full information can be secured from the railroads, or from the Secretary of the National Irrigation Congress at Chicago.

Information.

During the time of the Congress an Information Bureau will be conveniently located for the benefit and information of delegates and visitors, and every endeavor will be made to give them the best attention and accommodation.

Information relative to the Nineteenth National Irrigation Congress, program, rates, hotels, and other data will be furnished upon request from the office of the Secretary of the National Irrigation Congress, 214 Hotel La Salle, Chicago, Illinois.

May we enroll you as a fellow laborer in the great constructive work to which the Congress is devoted.

Chicago, Illinois, October 16, 1911.

THE NINETEENTH NATIONAL IRRIGATION CONGRESS.

By B. A. Fowler, President.

ARTHUR HOOKER, Secretary.

THE EXECUTIVE COMMITTEE,

By R. INSINGER, Chairman.

THE BOARD OF CONTROL,

By ROBERT R. McCORMICK, Chairman.

T E N T A T I V E
Official Program

Nineteenth National
Irrigation Congress



December 5-9, 1911
Chicago " " Illinois

Meetings

Morning Sessions: Auditorium Theatre, 56 East Congress Street

Afternoon Sessions: (Except Friday) Orchestra Hall, 220 South Michigan Avenue

Evening Sessions: Tuesday, Orchestra Hall; Wednesday, Art Institute; Friday, Auditorium Theatre

REGISTRATION HEADQUARTERS: AUDITORIUM THEATRE

TENTATIVE PROGRAM

NINETEENTH NATIONAL IRRIGATION CONGRESS

December 5-9, 1911

Chicago, Illinois

TUESDAY MORNING, DECEMBER 5. AUDITORIUM THEATRE.

10 o'clock.

Music.

Call to Order, Hon. R. Insinger, Chairman Executive Committee.

Invocation, Bishop C. P. Anderson.

Introduction, of Hon. R. R. McCormick, Chairman Board of Control.

Response—Chicago's Interest in the National Irrigation Congress, by Chairman McCormick.

Music.

Introduction, of Hon. B. A. Fowler, President of the Congress.

Music.

Welcome to the State, by Dean Davenport, of the Agricultural College, University of Illinois, Representing His Excellency, Governor Deneen.

Welcome to the City, by Hon. William H. Sexton, Corporation Counsel, Representing His Honor, Mayor Harrison.

Communication, from the President of the United States.

Response on behalf of the Congress, by President Fowler.

Report, of the Executive Committee.

Adoption of Rules, for the Congress.

Announcement, concerning Committees, instructions to State Delegations concerning appointments to be made by them.

TUESDAY AFTERNOON. ORCHESTRA HALL

2:30 o'clock.

Music.

Achievements of the National Irrigation Congress, by ex-Governor George C. Pardee, Past President of the Congress, Chairman State Conservation Commission (California).

Constructive Work of the Reclamation Service, by Dr. F. H. Newell, Director of the U. S. Reclamation Service.

Magnitude of Irrigation Interests, by R. P. Teele, in charge Irrigation Statistics, Bureau of the Census.

Discussion.

State Irrigation, by Senator William E. Borah (Idaho).

Government Irrigation in Montana, by Hon. Fred Whiteside, State Senator (Montana).

Irrigation by Private Enterprise, by Major Richard W. Young (Utah).

TUESDAY EVENING. ORCHESTRA HALL.

8:00 o'clock.

Music.

Making the Wilderness Blossom, by C. J. Blanchard, Statistician U. S. Reclamation Service. (Illustrated by stereopticon and moving pictures.)

WEDNESDAY MORNING, DECEMBER 6. AUDITORIUM THEATRE

9:30 o'clock.

Music.

Invocation, by Rev. Frank A. Purcell, D. D.

Drainage as a Basis for Development, by W. L. Park, First Vice-President Illinois Central Railroad (Illinois).

State Aspect of Drainage, by Judge R. V. Fletcher (Illinois).

Reclamation a National Duty, by Hunter C. Leake (Louisiana).

Discussion.

One and Indivisible: Forestry, Irrigation, Drainage, Navigation. The Rivers are the Greatest Asset of the Nation When Regulated for all Beneficial Uses, by George H. Maxwell, Executive Director Pittsburg Flood Commission.

Discussion.

The Uses of the Great Lakes, by Prof. Gardner Williams (Michigan).

Address, by James A. Frear, Secretary of State for Wisconsin.

Discussion.

WEDNESDAY AFTERNOON. ORCHESTRA HALL

2:30 o'clock.

Music.

Pan American Co-Operation in Irrigation and Drainage, by Hon. John Barrett, Director General Pan American Union.

Addresses by Representatives of Foreign Nations:

H. E. Federico Mejia, Minister of Salvador, Salvador.

R. H. Campbell, Director of Forestry, Canada.

Dr. N. Kaumanns, German Agricultural Commissioner, Ger-

C. W. Sutton, Director of Irrigation, Peru. [many.]

W. R. Ross, Minister of Lands, British Columbia, Canada.

Irrigation in Western Asia, by Arthur P. Davis, Chief Engineer U. S. Reclamation Service. (Illustrated by stereopticon.)

WEDNESDAY EVENING. ART INSTITUTE

8:30 o'clock.

Informal Reception at the Art Institute, by the Chicago Board of Control to Delegates and Guests of the Congress.

THURSDAY MORNING, DECEMBER 7. AUDITORIUM THEATRE

9:30 o'clock.

Music.

Invocation, by Bishop Samuel Fallows.

Irrigation and Prosperity, Senator Francis G. Newlands.

The Present State of Irrigation Development and a Forecast of the Future, by Prof. Samuel Fortier, in Charge Irrigation Investigations, U. S. Department of Agriculture.

Irrigation in the Humid States, by Milo B. Williams, Irrigation Engineer, Department of Agriculture.

Discussion.

Appropriation and Riparian Rights—The California Doctrine, by Judge George H. Hutton (California).

Discussion.

Drainage to Develop Commerce and Industry, by Col. A. R. Lawton, Vice-President Central of Georgia Railway Company.

Discussion.

THURSDAY AFTERNOON. ORCHESTRA HALL

2:30 o'clock.

Music.

Principles Underlying Water Rights, by Dr. W J McGee, Expert, Bureau of Soils, Department of Agriculture.

Call of States—Five-minute responses by representatives chosen by their respective delegations.

THURSDAY EVENING

Thursday evening is left open for Committee work and the pleasure of delegates.

FRIDAY MORNING, DECEMBER 8. AUDITORIUM THEATRE

9:30 o'clock.

Music.

Invocation, by Dr. Emil G. Hirsch.

Irrigation Finance, by Norman E. Webster, Jr. (New York.)

Discussion.

Relation Between Irrigation and Dry Farming, by Dr. John A. Widtsoe, President Utah Agricultural College.

Address, by Hon. Gifford Pinchot, President National Conservation Association.

Pumping for Irrigation, by T. U. Taylor, Professor of Civil Engineering University of Texas.

Discussion.

FRIDAY AFTERNOON. AUDITORIUM THEATRE

2:30 o'clock.

Music.

The Underground Waters of New Mexico, by Willard E. Holt (New Mexico).

Discussion.

Vital Phases of Reclamation Work, by E. J. Watson, Commissioner of Agriculture, Commerce, and Industry (South Carolina).

Discussion.

The Roosevelt Dam, by Hon. Dwight B. Heard (Arizona).

Discussion.

Irrigation from Reservoirs, by Horace G. Clark (Colorado).

Discussion.

FRIDAY EVENING. AUDITORIUM THEATRE

8:00 o'clock.

Music.

National Aspect of Drainage, by M. O. Leighton, Chief Hydrographic Branch U. S. Geological Survey. (Illustrated by stereopticon.)

SATURDAY MORNING, DECEMBER 9. AUDITORIUM THEATRE

9:30 o'clock.

Music.

Stream Pollution, by Dr. W. A. Evans, Former Health Commissioner of Chicago.

Address, by Dr. Harvey W. Wiley, Chief Bureau of Chemistry, Department of Agriculture.

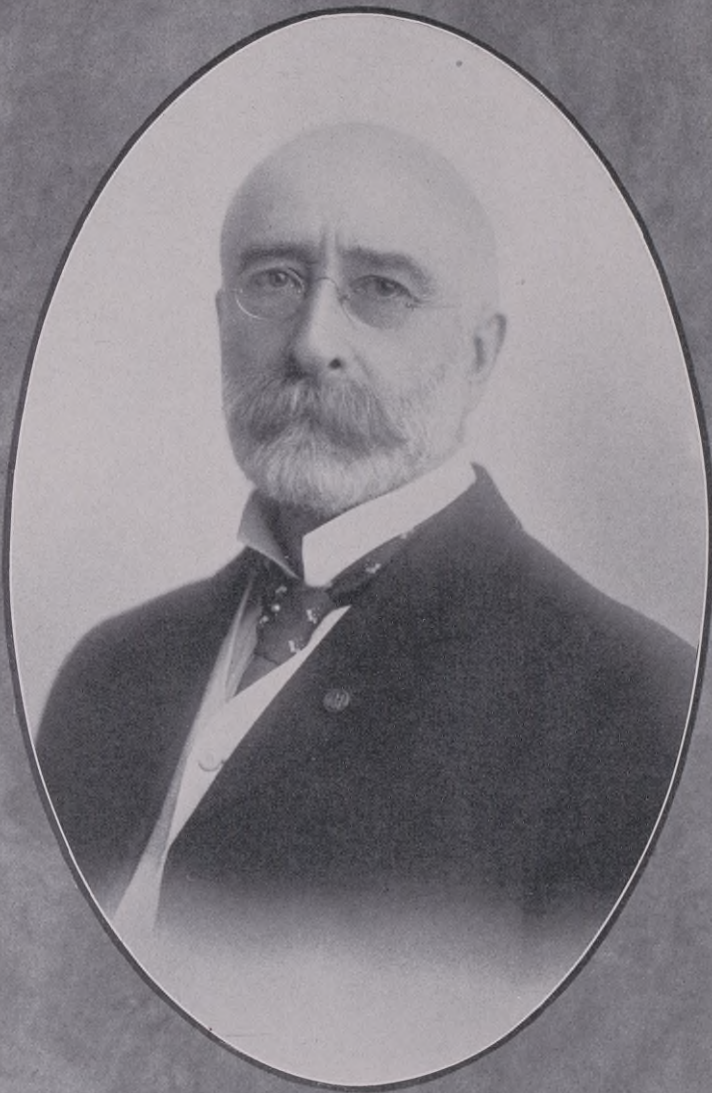
Report of Committee on Resolutions.

Report of Committee on Organization.

Selection of next place of meeting.

Election of Officers.

Adjournment sine die.



BENJAMIN A. FOWLER
President 18th and 19th National Irrigation Congresses

OFFICIAL PROCEEDINGS
OF THE
Nineteenth
National Irrigation Congress

HELD AT
CHICAGO, ILLINOIS
December 5-9, 1911

OPENING SESSION
TUESDAY, DECEMBER 5, 1911
AUDITORIUM THEATRE
10 o'clock A. M.

The opening session of the Nineteenth National Irrigation Congress convened at 10:00 o'clock, Tuesday morning, December 5, 1911, in the Auditorium Theatre, Chicago. A stenographic report of the proceedings follows.

HON. R. INSINGER, Chairman Executive Committee: Fellow Delegates: As Chairman of the Executive Committee, it is my duty and pleasure to call this meeting to order. I hereby declare the meeting of the Nineteenth National Irrigation Congress open, and I will call on Dr. Anderson, Bishop of Chicago, to lead us in prayer.

Invocation by
Bishop Charles P. Anderson
of Chicago

Almighty God, God of our fathers and our God, who has brought us thus forth into a wealthy place and has placed our feet within a large room, watch over, we pray Thee, the destinies of this nation; guide and protect all our deliberative and legislative assemblies; grant that all those who occupy positions of authority may be faithful and conscientious men; and to all Thy people give the spirit of loyalty, true patriotism and law-abidingness. Bless this land with honest industry, good morals and sound learning. May our institutions of learning be themselves taught of Thee, and may those who learn be made wise unto salvation.

Bless this Congress that is here and now assembled; prosper all its plans that are consistent with Thy will for the temporal and spiritual welfare of Thy people. Bring to naught the councils of those who would make plans contrary to what Thy providence orders. Direct this Congress in all its doings with Thy most gracious favor and further it with Thy continual help, that its work being begun in Thee may be continued and ended in Thee.

For Christ's sake. Amen.

CHAIRMAN INSINGER: Ladies and Gentlemen: It is not necessary for the Chairman of the Executive Committee to make any remarks. Later on I will submit for the Executive Committee our annual report.

I now take pleasure in introducing to you Hon. R. R. McCormick, the Chairman of the Board of Control, of Chicago. We all understand and know the great debt of gratitude we owe to the Board of Control of Chicago and to Mr. McCormick, its Chairman. I take much pleasure, therefore, in introducing Mr. McCormick.

Address by

Hon. R. R. McCormick

Chairman Board of Control

CHICAGO'S INTEREST IN THE NATIONAL IRRIGATION CONGRESS

Mr. Chairman, Ladies and Gentlemen:

I am informed that when various cities were competing for this honorable convention among the arguments put forth for Chicago was the excellence of its stores, and it was urged that the delegates could find many accommodations here, and likewise the boosters of other great cities claimed that their stores were equally good or better; whereupon, some man suggested that even if you could not get anything you wanted in the stores in Chicago, all you had to do was to go to Springfield, and the legislature of Illinois would sell you the whole State. (Laughter and applause.)

Let us not take that remark too seriously, but let us all regret that such a remark can be made about any state in the Union. It is because remarks of this kind are common talk throughout the state, that Chicago and Illinois are particularly glad to have you come here and look at us and see us and know us and convince yourselves that we are not the kind of people that our legislature of a few years ago might lead you to believe.

We believe we are as a whole pretty much like the rest of the Union, honest earnest men, willing to put our shoulders to the wheel, and help any good movement toward patriotism.

We think it particularly fitting that a national movement should hold a convention in Chicago, because Chicago is a great city, very near the center of population of the United States, and the natural center of effort in any great national movement. Chicago is glad to have the Irrigation Congress here. Chicago is glad to meet the men who have worked so hard for the cause of irrigation. Chicago is glad of your success, glad of what you have been doing for the country, but we are more glad of one thing than we are of your great engineering works, than we are of the great help to agriculture which you have achieved: we are glad of the cleanness, the honesty and the uprightness of the irrigation movement. (Applause.) We see in the reclamation laws a vision of the ideal when we compare them with the piti-

able log-rolling, pork barrel rivers and harbors bills that have disgraced this nation year in and year out for generations.

In the early days there was so much of these United States and so little of people that there was not only enough land to go around, but there was more than we could use. But, the land was limited and the people were not, and the people have grown until they have taken up most if not all of the free lands.

In the early days the only great public works we looked forward to were such as might make commerce more easy in the way of improving a great harbor or in the case where such great profit could come in from an engineering work that it would be taken up perhaps as a speculation, but those days have gone by. Our population is getting dense. We are beginning to realize, if only in the smallest way, that pinch of want which drove our ancestors from the mother country. We are beginning to look forward to that time when we shall have need to put in the same intensive cultivation that is necessary on the other side of the Atlantic and Pacific oceans. Hence, we have to look forward to a comprehensive, businesslike conservation and development of all our resources. (Applause.)

In the State of Illinois we have some two or three hundred legally organized municipal drainage districts. In some cases they build levees to keep the river out; in other cases they build ditches to drain the land. They have been built without any general scheme, without thought of the neighbor ten miles away, and frequently the levee district backs up the river onto the higher land, and, of course, the drainage ditch increases the flow on the land below.

We are beginning in this state in our dim way to realize that something must be done along comprehensive lines, and there has been organized in Illinois a Rivers and Lakes Commission, which, while its powers are almost nil, may still serve as a germ, may well be the parent law of some fully comprehensive state commission to look after our local interests in Illinois.

We have gone far enough where we will welcome any kind of a reasonably successful federal law either by the appointment of a commission or otherwise to regulate to its best use all the water which falls upon the surface of our land, bearing in mind irrigation, navigation, drainage, and all the uses to which this water can be put; and the prevention of all the harm which it can do if misused.

Realizing that in order to get the best result one must have comprehensive knowledge through experts of what should be done, we welcome in the greatest sense an Irrigation Congress where experts who have devoted years of their life to the study of this question can spread their information broadcast, recognizing from the bitterness of our own experience that in order to bring any kind of good to the public, the utmost broadminded honesty toward all must be the watchword. We condemn local bickering; we condemn men looking for local advantage; and we look forward to a movement nationwide to bring the greatest financial benefit to the nation and to bring the greatest moral uplifting to its people. (Applause.)

Ladies and Gentlemen, Directors and Executive Committeemen and all, the city of Chicago welcomes you with open arms to a free and open discussion, to earnest study, and to the conclusion which is bound to come, and that is the benefit of all. (Renewed applause.)

CHAIRMAN McCORMICK: I find that there is one more pleasure in store for me, and that is, as Chairman of the Board of Control of Chicago, to introduce to this Congress a man whom I have known but for a few months, but whose character I have come to admire and whose ability I can readily recognize; a man who has devoted so much to this great cause, President Fowler of the Congress. (Prolonged applause.)

PRESIDENT FOWLER: On the program I see that we shall have the pleasure of listening to a little music before the response of the President.

At the close of a selection rendered on the pipe organ by Mrs. Katharine Howard Ward, President Fowler said:

Response by

Honorable B. A. Fowler

President Nineteenth National Irrigation Congress

Ladies and Gentlemen: The businesslike introduction of the honorable chairman of the Board of Control is characteristic of him, I am sure, and I know it comes straight from his heart, because I know something of the man. Hence, it puts me at ease.

To be presented to an audience made up of bankers, merchants, professional men, representatives of all the mechanic arts, men who are to-day making the history of this metropolis of the West, the wonder of the whole world, is a great honor. But, when such an audience includes not only business men, but also farmers and agriculturists, land owners, ranchers, and practical irrigationists, as I see them all here before me and recognize a great many of their faces, men who have come not only from the rich and humid valleys of the Mississippi, the Missouri, and the Ohio, but also from the arid West, the fertile South, and even the rockbound shores of New England; men who have come for a single purpose, as you have been coming year after year and year after year for the last twenty years, solely for the public good, for universal conservation, then indeed it is a greater honor. (Applause.)

I am glad to recognize so many of the faces that I see before me, and I sorrow to miss many of the familiar faces of those who have met with me for years in these annual gatherings.

The record of this organization in the past has been one of action and achievement, and we may confidently predict a like record for the future.

I want to extend to all the delegates a very cordial greeting. Some of you belong to the old guard, so-called, who have been laboring for the last fifteen or twenty years, year after year, giving of their time and their money freely, inspired by a great national idea. Others of you belong to the newer and to the later recruits. I wish I could meet you all personally, and it will be my pleasure to meet as many of you as I may.

The program prepared for this Congress is rich in material, broad in scope, practical, interesting, and instructive. You have a great feast before you. In the consideration of many of the questions that will come before us it is inevitable that there will be sharp differences of opinion and diverse judgments. Even so—and I touched upon this same subject last year, only more in extent than I shall this year—even so, let us remember that patience and courtesy beget the same in return; that those are characteristics of gentlemen everywhere, and that the Golden Rule applies equally in the sharpest debate.

And now, Mr. Chairman of the Board of Control, allow me as the official representative of this organization to express to you the grateful appreciation that the delegates feel, and the national officers in particular, having come in contact with you and your assistants many times during the last year in the preliminary work, for the complete provision you have made, not only for our comfort, but also for the easy and rapid transaction of business. If you had done more, we should have been embarrassed. If you had done less, we should have been disappointed. We have now before us the rich fruitage of many

months of labor, unity of purpose, and rare executive ability.

You have done your part well. The Board of Control, the Honorable Chairman, and all his lieutenants, you have done your part well. It is now up to the Congress itself to make another record. (Applause.)

PRESIDENT FOWLER: The Secretary has some announcements which he will make to the Congress.

SECRETARY HOOKER: As you are all aware, the National Irrigation Congress met last year at Pueblo, Colorado, and, although the Congress comes to another place for its meeting this year, Pueblo and the people of Colorado have not lost their interest in the Irrigation Congress. It gives me great pleasure at this moment to call upon Mr. Schmidt to speak a few words showing the spirit of Pueblo. (Applause.)

Presentation of GAVEL TENDERED BY PUEBLO, COLORADO

MR. C. B. SCHMIDT, Commissioner of Immigration of the Rock Island Lines: Mr. President, I am commissioned to address you personally, and the Congress through you.

A thousand miles west of us, at a point midway between the Pike's Peak range and the Greenhorn Mountains of Colorado, where the muddy waters of the Arkansas River debouch upon the plains, there to be harnessed to their high mission of making the erstwhile desert blossom as the rose and to contribute to the sustenance of the nation, there stands the City of Pueblo, up to within a year ago chiefly known as the Industrial Workshop of the Rocky Mountains. The volume of smoke discharged through the hundreds of smokestacks of the smelters and steel works were looked upon as the sole barometer of Pueblo's prosperity. The work of the waters of the river were little thought of. The thousands of busy hands that produced the smoke and kept the furnaces aflame were the city's principal asset.

How now? The National Irrigation Congress came along last year and held its Eighteenth Annual Session at Pueblo, under the roof of the great Mineral Palace. This meant the dawning of a new era for the smoky city of the Rocky Mountains. Water and Irrigation has since become the battle-cry of the Pueblo people. The three big "I's," standing for "Irrigation—Immigration—Industries," have been inscribed upon the banner of Colorado and Pueblo, and this is what the Eighteenth National Irrigation Congress has done for Pueblo and Colorado.

The Pueblo citizens have commissioned me, one of their former fellow-workers, to present to you, Mr. President, this gavel, the emblem of your authority, as a souvenir of two congresses over which you have been called to preside, and also as a token of the high esteem in which you are personally held by the citizens of Pueblo. (Prolonged applause.)

In its make-up and ornamentation it typifies the resources of mountain and plain within the county of Pueblo, and its workmanship is that of Pueblo artisans. It is meet that a handsome presiding officer should wield a handsome emblem of his office. (Applause.)

The Pueblo people wish you, Mr. President, good health and a long continued useful life in the interest of the great national cause with which you are so conspicuously identified. (Applause.)

After the applause which greeted the presentation of the gavel to President Fowler, he responded as follows:

PRESIDENT FOWLER: The chair has been so overcome and shocked by the recent events of the last few minutes that he is nearly

speechless, but the chair does wish to say that he appreciates more than words can express this indication of the good feeling toward himself on the part of the citizens of Pueblo who did such magnificent work last year. Your chairman has been sincerely gratified to have been informed from time to time during the last year of the good results that came to Pueblo and the other sections of Colorado from the holding of this Congress in Pueblo.

Under such circumstances the chair is in a hard place and will simply say that this presentation sheds a whole lot of light upon conditions upon the platform, because the president instructed the secretary to see that he had a good large gavel—not a little one that he could smash all to pieces the first or second time he struck the table—and the secretary very quietly said: "I will see that later you have one big enough." (Laughter.) He evidently was in the secret and the chair was not. The chair had no inkling whatever that this was to come.

This gavel, I wish to say to the audience, has on one side in silver "Pueblo"; on the other side "Chicago." On one side of the handle is inscribed: "Science bids the Desert drink." On the other side of the handle: "Presented to Benjamin A. Fowler from Pueblo, Colorado, Citizens." I will endeavor to put this to good use. (Applause.)

PRESIDENT FOWLER: The first memorandum on the list of the president was to follow the suggestion of the Honorable Chairman of the Board of Control, and ask the delegates who are here present to mass themselves together as much as they possibly can. The Chairman of the Board of Control informed me that this was a very difficult hall to speak in, and we have come here for a purpose. We want to carry out that purpose while we are here, and we want to return to our homes having accomplished some things for the good of the country and inspired by the meetings that we have from day to day during the week to move forward to a better work, not only for our own localities, but a broader work for the entire nation, along the line of national irrigation, than we have ever accomplished before. (Applause.) So, for your own good and for our good and for the good of the Congress and the good of your community and the good of the country, come down and get together. (Renewed applause.)

I have received letters and telegrams from a number of delegates stating that they will not be able to get here this morning. In some cases they will arrive this afternoon and in other cases they will not reach here until to-morrow.

I have the pleasure of presenting to you Dean Davenport, of the Agricultural College of the University of Illinois, representing His Excellency, Governor Deneen.

Address by

E. Davenport

Dean of the Agricultural College, University of Illinois, Representing
His Excellency, Governor Deneen

WELCOME TO THE STATE

Mr. President, Ladies and Gentlemen: It is greatly to be regretted that the welcome of the Chief Executive of so great a state as this should have to be delegated to another. But that frequently happens, because the Governor is a very busy man with many things to do, and therefore I am commissioned by him to assure you of your

very warm welcome inside the borders of this commonwealth. Beyond that assurance I have no commission from the Governor, and in the few words that I shall say in addition I am not attempting to represent that officer.

I am sure this welcome rests upon three or four very evident facts touching the business of this Congress. I read upon your letterhead that the conservation of the forests is one of your aims. I only wish that more forests were left to be conserved. I have myself seen within my own lifetime the destruction of the great body of American forests east of the Sierra Nevadas. It is too bad. It ought not to continue.

I see you propose also to conserve the floods, and I suppose that is, because we have learned in recent years, perhaps also in recent months, that the limiting element of human population is not room, nor land, nor even the fertility of the soil, but water. Water, the amount of water which we may obtain and use, is what will decide ultimately the density of human population in this land.

Here, then, are two great pieces of conservation which this body is undertaking; and Illinois will always welcome to its borders any congress or any body of men who devotes itself to so high and noble a purpose.

I was glad the temporary chairman emphasized that other word, however, development, which is more than conservation. A thing which is simply saved is of little use. I see you propose to make the desert blossom as the rose, and I hope you will. You certainly can.

I welcome the officers of a Congress such as this in this great business, partly in order to see the work done, and, partly, I am bound to say, from the fact that when it is undertaken by bodies such as this, the element of speculation will be somewhat controlled. I may say to you that the eyes of the young men of this country are upon you as to how and in what manner and for what purpose you develop the desert areas of this great country. If, in the development of these desert regions the broadest dictates of national welfare guide the work, then all is well. But if our deserts are to be developed merely for the pecuniary advantage of certain speculative individuals, then all is far from well.

Now as I read the signs of the times, and as I see the reflection of things in the West, I am sure that you understand that this thing upon which I have laid my finger lightly is one of the problems which you must consider and solve—that is, how to develop the desert regions of this great country as a national enterprise and not exploit the desert, as I am sorry to say some of the people have exploited other portions of this great country.

Again, you are welcome because you undertake to provide homes for the homeless, and in this connection I have only to offer this suggestion, that as this great work is to go forward without exploiting the land, so it ought to go forward without exploiting the landless.

The remark was made the other day in another national convention that the "back to the land" movement had reached in some senses the hysterical stage, and nothing could be truer. In another great national movement now in progress in this great city to consider the means whereby this country can be further developed, the fact has been brought out that many people are better off upon the land than they would be in the cities. Let us remember another fact, that many people are better off in the cities than they could be on the land. No man, and much more no woman, is to be enticed to the land when he or she has nothing but a little money which may be abstracted from the individual.

These are all large questions. All these are questions which must be considered by bodies of men in the light of national welfare, and not by small movements and by a few people here and there.

So I bid you welcome to this great state. I have only one more word to add. When the King of England and the Emperor of all the Indias desires to enter the city of London, he must get formal permission of the Lord Mayor of that great city. And so the Governor of the state has directed me to assure you of your welcome to this commonwealth.

You have still to recognize Chicago. You will find Chicago a good city. I am sure your sojourn here will be a comfortable one, because the spirit of this city is like the spirit of your enterprise. It is progressive and looks to the future and not to the past. This is the city that the next morning after the Great Fire rebuilt itself, the greatest piece of conservation through development that this country has ever seen. So this is a good place right here where you are to consider the great questions that must confront a national congress of this kind. I thank you. (Applause.)

PRESIDENT FOWLER: I remember very well eleven years ago when the ninth session of the Irrigation Congress was held in Chicago, we had the pleasure of being welcomed to the city by Howard S. Taylor, city prosecuting attorney, representing the mayor. I now have the pleasure of presenting to you Hon. Edward T. Wade, assistant corporation counsel, representing His Honor, Mayor Harrison, in welcoming this Congress to the city.

Address by

Edward T. Wade

Assistant Corporation Counsel, Representing His Honor,
Mayor Harrison

WELCOME TO THE CITY

Mr. President, Ladies and Gentlemen: I noticed with much interest the inscription on the gavel that was presented to your honorable president reads: "Science bids the Desert drink." Let me be just as pithy and, I hope, just as effective when I say to you, ladies and gentlemen of the Nineteenth National Irrigation Congress, that Mayor Harrison bids you welcome.

After hearing the eloquent remarks of the two estimable and esteemed gentlemen who have preceded me in extending a welcome to you, I fear that if I address you at any length I would be wearing this welcome out, and I do not propose to do that.

I am reminded of the story of a good old Irish clergyman who was far-famed for his eloquence in Ireland, but who had the habit of talking at great length, and, on the particular occasion of which I speak, the good old minister had chosen for his subject the different places the prophets should have in sacred history. For one hour he discoursed as to the place the major prophet should occupy in sacred history, and his congregation was sure he was about to conclude. And then for another hour he spoke about the place the minor prophet should have in sacred history, and the congregation was quite sure that that would be the end, and then he said: "Now, my brothers, I have given to the major prophet his place in sacred history, and I have given to the minor prophet his place in sacred history. Now, to what seat shall I assign Malachi?" And one old Irishman got up and said: "Reverend Sir, if there do be no objections, Malachi can have my seat, for I am going home."

Now, I do not propose to have anyone within the range of my voice surrender his or her seat to any Malachi.

Ladies and gentlemen, the Mayor bids me say to you that it is at a great sacrifice that he is not here to welcome you. In view of the illness that has been in his family for years, it has been his purpose to spend two or three months on the western coast, and for that reason he has been immensely interested in everything that your irrigation congresses and that you men who are responsible for the development of the reclamation service have done.

In conclusion, let me say to you that he wishes you well while here, that he extends to you every hospitality that the people of the city of Chicago can give to you and that he wishes you great success in your efforts and in your deliberations. I thank you. (Applause.)

PRESIDENT FOWLER: The western coast will extend a very cordial welcome to the Mayor of Chicago. I notice that from time to time the Easterner comes to a point where he has to desert the climate of the East—the killing climate of the East—and seek a more salubrious climate where he can breathe ozone and restore his jaded faculties and recruit his physical strength. We always welcome them, because among that class usually is the best blood that the East produces. It naturally gravitates toward the West.

I have a communication here from the President of the United States. It reads as follows:

Communication from
William H. Taft
President of the United States

Though I shall have to be in Washington at the time the Nineteenth National Irrigation Congress is in session in Chicago, I am very glad to take this means of assuring the friends of irrigation of my continued interest in the subject and my belief in the importance of going forward without a halt in the work of bringing under cultivation and making habitable by man the arid regions of the United States.

I am strongly in sympathy with the general purposes of the Irrigation Congress, and earnestly hope that its session this year may be fruitful of great good for the cause of irrigation.

With cordial greetings to the delegates who will be assembled, believe me,

Sincerely yours,
(Signed) WILLIAM H. TAFT.

PRESIDENT FOWLER: The next order of business on the program is a response on behalf of the Congress by the President.

Address by
Benjamin A. Fowler

President Nineteenth National Irrigation Congress

I desire to address the Representative of the Governor, the Representative of the Mayor, the Distinguished Guests who are here present, and especially those from foreign countries, Fellow Delegates, Ladies and Gentlemen: At, and since, the Eighteenth Irrigation Congress at Pueblo, Colo., last year, the question has been asked many times, "Why should the Nineteenth Irrigation Congress cross the Mississippi River into a humid country to hold its sessions?"

The Irrigation Congress comes to Chicago because here, in its broadest sense, is the source of supply and center of distribution for

the arid West; here is the greatest railroad center on this continent; the greatest inland port in volume of business; the second greatest commercial center; and the financial center of the West; here Art, Science, Music, Education, Civics, find their most devoted followers; here invention, the mechanic arts, and the infinite manifestations of human energy are seen on every hand; here agriculture, commerce, manufactures, and the marvelous skill of man have combined to construct a most amazing municipality, the wonder of the world; here have been financed scores of western irrigation projects which have successfully brought under cultivation hundreds of thousands of acres of barren and desert land; have made thousands of happy, prosperous homes; have built up new communities, new towns, new cities; have created new assets and increased by millions the wealth of the nation; and last, but not least, have returned a generous, adequate interest and profit to conservative investors.

Here the East meets the West, and not far away the mighty Mississippi flows majestically to the Gulf, bearing on its tawny bosom life, productivity, wealth—an impressive illustration of the power and efficiency of united effort. From the northern boundary of our domain, even from the Canadian border and the Lakes of Minnesota, the "Father of Waters" comes down to meet the Ohio with its rich freightage of mining, agricultural, and manufactured products from the Middle and Central States. Farther along, the turbid Missouri pours in its wealth of moisture, the contribution of the Rocky Mountains and the Great Plains, while the Tennessee, the Arkansas, the Red, and other tributaries complete Nature's greatest river system, which unites by bonds far stronger and more enduring than steel or bronze the commercial interests of the grandest federation of States this world has ever seen.

Here, indeed, is a lesson for us, and let us ponder it well. It is this: "In union there is strength." Whenever the people of the North and the South, the East and the West unite on any policy, question, or project, their power is irresistible, and success is already won.

So there is every reason why this year we should come to Chicago, outside though it be of so-called arid America and in a humid region.

We of the West are proud of Chicago. We need you and you need us. We need the capital, character, intelligence, brawn, and brain of the farmer, capitalist, business man of the East, North, and South, of the valleys of the Mississippi, Missouri, and Ohio, to help in developing the buried resources, raw material, and agricultural and commercial possibilities of the West. While to every such man Dame Nature beckons and offers a home, financial independence, soil of surpassing fertility, climate superb, and a future.

New England, with its rock-bound coast and granite hills, is beautiful. There lie my ancestors of the last two or three hundred years—sturdy men and women, who helped to mold the national character.

The Middle States with their vast mining and manufacturing resources are a mighty element in our body politic.

Virginia and the South, Ohio and the Northwest, with their fertile fields and natural resources, are great revenue producers.

But there is a greater fascination and a greater charm in the unlimited opportunities of the great West with its mineral and timber wealth, its cattle and alfalfa, its citrus fruits, its fertile valleys, and the grandeur of its mountains; but, above all, in its spirit of independence, in its fervid patriotism, in the quality of its citizenship. There is, too, a fascination and a constant delight in the consciousness of being a potent factor in local development and creation; of living in an ozonic atmosphere of construction, municipal upbuilding, and civic uplift. In short, there is joy and daily inspiration in life, growth, and perennial expansion. No longer do the people of the East indulge in cheap wit and sarcasm at the expense of the West. "Alkali Ike,"

the concept of a diseased brain, and the "Arizona Kicker," with its misrepresentations and coarse wit, all at the expense of the West and Southwest, have had their day, and let us hope, have been buried forever.

Slowly, but surely, "Westward the star of empire takes its way." Slowly, but with equal certainty, the center of population moves westward. From New England across the continent, the pioneer has blazed the trail, carried the church and "little red schoolhouse," planted them on hill-top and in valley, and crossed the Western prairies and the Rocky Mountains, where is now developing the highest type of manhood, womanhood, and civilization.

The harnessing of the floods of our great Western rivers and compelling them to turn death to life, desolation to beauty, desert to garden, barrenness to fertility, poverty to wealth, and degradation to civilization, was, but a few years ago, considered a wild fancy. Nevertheless, we ourselves have seen all of this accomplished by the pioneer and United States Reclamation Service, and the end is not yet. To quote the late Governor Johnson, of Minnesota, there are still in the West, "Homes for the homeless; food for the hungry; work for the unemployed; land for the landless; dangers for the brave; an unknown world to conquer; and room for all."

The early records of the Irrigation Congress are to-day, in the light of the present, of peculiar interest. The First Congress met at Salt Lake City, September 15-17, 1891, more than twenty years ago. It was a serious body of men from the Pacific coast and Rocky Mountain states, inspired by a great idea. Among them no delegate was more active and influential than Hon. Francis G. Newlands, of Nevada, who for many years has ably represented his State in Congress and whose name is inseparably, and justly, linked with the National Irrigation Act. Governor Thomas, of Utah, delivered an eloquent and prophetic address of welcome. Near the close he said: "The question of ceding the lands to the States is not a new one. In 1837 a measure was introduced in Congress to cede the public lands to the new States. In the rich valley of the Mississippi, and in other sections of the country, the question of the swamp lands was solved by the action of Congress in ceding them to the States. These lands were granted for purposes of reclamation, and because their condition was such that it would entail an annual expense to bring them under cultivation. This is the condition of the arid land to-day, only the problem so much more difficult and the expense so much greater, that if a proposition were made to have it met by the general Government, the great body of Congress, unfamiliar with irrigation, would recoil before it." The essence of the resolutions adopted at this Congress was "the granting in trust, to the States and Territories, needful of irrigation, all lands now part of the public domain within such States and Territories, excepting mineral lands, for the purpose of developing irrigation." On this question, the sentiment of delegates in the years succeeding the First Congress was about evenly divided. For five years the battle was waged until the Sixth Congress at Phoenix, the first that George H. Maxwell, of California, attended and in which he took strong ground in opposition to State cession of public lands, as above, and in favor of the National Irrigation policy. From that day he became the Apostle of Irrigation by the Federal Government, and for six years an acknowledged leader carried on the propaganda in every section, from the Atlantic to the Pacific, until the passage of the National Irrigation Act closed a nation-wide campaign, won a magnificent victory, and buried forever the State cession policy of the First Irrigation Congress.

At this time, we may with profit recall the fact that the Ninth annual meeting of this Congress was held at Central Music Hall in this city, November 21-24, 1900, from Wednesday evening to Saturday

afternoon—nine busy meetings. Hon. Elwood Mead, then of Wyoming, now of Australia, where he is filling a large place in the irrigation development of a new world, was President, and George H. Maxwell, Executive Chairman. A letter from Theodore Roosevelt, then Governor of New York, was received and read amid great enthusiasm. City Prosecuting Attorney Taylor, of this city, for Mayor Harrison, delivered an address of welcome, which was eloquently responded to by Mr. Maxwell. And that we may see the Congress from the viewpoint of eleven years ago, may I condense briefly from his address, as follows:

"For the first four or five sessions of this Congress practically no tangible results were accomplished. The reason is not far to seek. It has no definite purpose or policy. At Phoenix, Arizona, in 1896, the Congress gradually began to evolve a distinct and positive object as a reason for its existence, namely, to enlist the Federal Government in the solution of the great problem of the reclamation of arid America. Three years later at the Missoula, Montana Congress it had become a declaration. And, my friends, when you have a definite principle and purpose, and have the confidence of the people that you are loyal to that purpose, you can secure all the strength and influence you want. That so many have come from the far West, and from western States, to attend the deliberations of this Congress, is due to the fact that by coming they believed they would uplift and strengthen the cause of National Irrigation."

And so the battle was won. From that day, the National Irrigation idea grew, and spread, and multiplied, through the heroism of the "old guard," who for years unselfishly, freely, contributed of their time, money, and ability for a national principle. Some have gone to their reward, others still live. In a few years all will be dead and forgotten, but their achievements will go down as a rich heritage to coming generations. This is too often the reward of pioneers, patriots, and workers for the public good, and if any such, having done public or semi-public work, look for, or expect, full compensation this side of heaven, they are quite likely to be sorely disappointed.

As the construction work of the United States Reclamation Service goes on, the reason for the existence of this Congress is demonstrated and emphasized. No one will deny, but for the Irrigation Congress, both the Irrigation Act and the Reclamation Service had never been, and the history of the arid West would read very differently from what it does to-day. And yet, even the people and localities in arid America which are most benefited by this law have to-day little comprehension of this fact. Not many of them realize that these monumental structures of masonry and concrete which the Federal Government is now constructing, destined, as they are, to play such an important part in contributing to the wealth, happiness, and prosperity of the arid West, are all the tangible results of the vigorous propaganda which for years before the passage of the National Irrigation Act this Congress carried on for Irrigation, Forestry, and Reclamation in the face of general ignorance as to the facts, sectional prejudice, and hostile criticism. Then it was considered an iridescent dream, and treated accordingly by the great majority everywhere. But the idea contained a living germ, a vital principle, which steadily grew and flourished. In time, far-seeing men began to advocate it. Statesmen and orators enlisted in its ranks and eloquently emphasized the benefits to accrue, not alone to arid America, but to the entire nation.

Thus briefly have I sketched the connection between the Irrigation Congress of 1891 and the Congress of 1911, in order to make clear the tremendous obligation which the arid West is under to this organization, inspired only by public spirit and whose sole aim is the public good.

SUGGESTED AMENDMENTS TO THE NATIONAL IRRIGATION ACT.

More than nine years have passed since the Irrigation Act became a law and the Reclamation Service was organized. As anticipated by its friends, the Act has in practice demonstrated some weaknesses, which could not be foreseen, but ought now to be corrected:

1. The time limit of ten years in which to return to the Government in equal annual payments, the cost of construction of a project, is now recognized as too short and the necessity of an extension is generally understood and admitted by everybody.

2. Theoretically, irrigated lands under any Government project ought to furnish the best of security for a conservative mortgage loan, at a low rate of interest. But what is the fact? Outside capital shies at such loans because, in case of foreclosure, the Act operates against the mortgagee and prevents him, as a "non-resident," from securing title. This ought to be remedied in the interest of both mortgagor and mortgagee.

3. Experience has shown that, when any project is nearing completion, acreage property has so appreciated in value that the opportunity for the speculator, as such, or the large capitalist, has gone forever. When that time comes there should be no unnecessary limitation on the buying, selling, alienation or transferring of lands. This will expedite the cutting up of larger holdings, multiply the number of small homes, bring in new, outside capital and work to the interests of the entire community. Then the owner should no longer be required to live on or in the vicinity of his land. I call the attention of the delegates to these acknowledged weaknesses in the Irrigation Act, with the hope that they may be given the consideration which their importance deserves and proper resolutions regarding same be adopted.

SWAMP LAND DRAINAGE.

While Forestry, Irrigation, and Reclamation have furnished the legend, "Save the Forests, Store the Floods, Reclaim the Deserts, Make Homes on the Land," yet there is another phase of reclamation which has not been neglected. Few of the Government, or the more important private, irrigation projects but have also to face the problem of drainage, a fact which has naturally brought this Congress into close sympathy with swamp land drainage, as embodied in its resolutions of past years.

Of the land area of the United States (about one billion, nine hundred twenty million [1,920,000,000] acres) more than half is either too dry or too mountainous for settlement. Nearly all of the remainder has now passed into private hands, so that "Uncle Sam" is no longer "rich enough to give us all a farm." Indeed, the Federal Government has already undertaken to eke out the supply of land for homes by irrigating the fertile valleys of the arid West. Some seventy-five million (75,000,000) acres have been, or may be, reclaimed by Irrigation; these lands are so richly productive that they will sustain a population of seventy-five million (75,000,000)—equal to that of the United States in 1900.

In addition to the land area available for reclamation through irrigation, there are in the United States some eighty million (80,000,000) acres of swamp and overflow land not now available for settlement but susceptible of reclamation by drainage. These wet lands are distributed throughout every State, though the more important areas lie along the Gulf and Atlantic Slopes, with considerable areas in the Pacific States. They are generally of great fertility, and if reclaimed by drainage would sustain a population of over ninety millions (90,000,000)—equal to the present population of the entire country. These wet lands of the United States are justly regarded by competent authorities as a rich resource and should be utilized as need for homes on the land increases with our growth.

While not yet settled or cultivated, save locally in a small way, most of the wet lands have been ceded to States and have passed into private ownership. In some cases they are so situated that they may be drained by private enterprise or by the States. But by far the greater portion of the area (for example, in the lower Mississippi region), is so located that drainage projects would necessarily affect several States so that the drainage problem is essentially an interstate problem involving Federal action perhaps in co-operation with the States.

To every thoughtful citizen it is clear that one of the great public needs of the day is the extension of reclamation over the wet lands of the country; and it is important that the requisite action be taken by State Legislatures and the Federal Congress, in co-operation with private owners, at an early date.

A powerful agency in shaping thought and concentrating public effort, exists in this Irrigation Congress; here we have a voluntary organization of citizens that may justly be said to have originated the Irrigation Act (which Theodore Roosevelt declared the most beneficial Act of his entire administration), out of which grew the Reclamation Service, and to have done much during the past twenty years toward inspiring and expanding the Forest Service. This influential body has announced in its Official Call for the Congress, that "Provision has been made for giving exceptional attention to Drainage, both in connection with irrigation projects and for the reclamation of swamp and overflow lands in the humid as well as in the more arid portions of the country."

Under this authorization, the Board of Control have invited public attention especially to the drainage of our wet lands as a means of national growth and continued prosperity. The attendance of citizens interested in swamp and overflow lands has been cordially invited; and officials of States containing such lands have been earnestly urged to appoint delegates in the interest of the development of this great, but hitherto neglected, resource. It seems peculiarly fitting for the interests represented in the wet lands to combine with the interests represented in the arid lands, especially in moving for Federal legislation required to develop the former effectively. For while the wet lands are widely distributed, the greater areas are confined to so limited a portion of our territory as to render most desirable the same sympathy and support of the Great West in which the Irrigation Congress has grown up, as the arid West received from the South in support of the Irrigation Act.

Thus far no attempt has been made to formulate a policy looking to the reclamation of our wet lands by drainage; but it is hoped that the deliberations of this Congress will lead, or, at least, point the way to adoption of a wise mode of procedure, both by the States and by the Federal Government.

The success of the movement for reclamation of wet lands by drainage cannot be assured without the hearty co-operation between all the States, but especially between the States of the South and West. The two sections must pull together. Any effort to divert this Congress from its primary purpose would arouse a spirit of hostility and antagonism; on the other hand, every effort to enlarge the understanding and enlist the support of western representatives would be helpful to the South. Should it be found feasible to create a Committee on Drainage, it ought to include representatives of the West no less than of the South, and its report in 1912 would undoubtedly be of greater force if submitted in a western city in such terms as to insure western support.

The Swamp Land Drainage crusade, embracing as it does, more than eighty million (80,000,000) acres of wet land in thirty-five States of the Union is a proposition so big, involving so many millions of

dollars and such vast interests, individual, State, and national, that it must inspire the biggest brained men interested in its development. Again and again by resolutions has this Congress called the attention of the Federal Government to the crying need for such national action. Personally, I do not know any western man who is not willing and anxious to contribute in every way to arouse the entire nation, but especially the Federal Congress, to a full realization of what the drainage of these wet lands would mean to thousands of homemakers; what the increase of taxable wealth would mean to the nation at large by making land, now dormant and of little or no value, worth from fifty to one hundred dollars per acre; what a necessity now exists for removing from many sections conditions which that eminent authority, Dr. Evans, ex-Health Officer of this city, says "serve to spread foci for diseases and radiate a pall of inefficiency on those who live on nearby lands," this annually costing thousands of valuable lives and making more thousands unprofitable to themselves, the State, and the Nation. In other words, this is a superb question of National Conservation which will readily appeal to patriotic and public-spirited citizens, North, East, and West, as well as South. "In union there is strength." Let us all pull together.

THE REAL GIFT OF IRRIGATION.

While the benefits derived from irrigation are often stated in measurable terms by acres of land brought under ditches, by bushels or tons of product, and by increased population of arid States—all this, great though it be, fails to express the full measure of the benefits; for the chief gift of irrigation lies in the raising of standards of excellence.

Through irrigation new standards for fruit have been set. Apples grown on irrigated land have a richness of color and flavor, a perfection of form and fullness of size that have been a revelation to the world. To-day the apples of irrigated orchards supply the tables of aristocracy, and even royalty, throughout all Europe, and the European demand is so great that apple-producing New England, New York, and Michigan can seldom get sight of our irrigated fruits. Western cherries, too, grown on irrigated lands and shipped to the East under an almost prohibitive transportation tax, are largely displacing the local product, though sometimes fulfilling their real destiny of inspiring orchardists to strive for corresponding improvement in their own standards. The prune and the apricot of irrigated lands equally rise above the standard set in humid countries. But the brightest jewel in the crown of the Goddess of Production is the irrigated orange of California and Arizona—the most perfect fruit of all the earth, luscious beyond compare, because of continuous sunshine which develops the saccharine, and by reason of growth and gradual ripening with the right quantity of water supplied when needed, so that the vital energy of the plant goes into the enrichment of juicy pulp with a minimum of waste. Not all lands and climates are adapted to citrus fruits, but wherever they grow these are made better by efforts of producers to imitate the standards originally set in irrigated lands.

While fruits are better known than other irrigated products, they are no more striking than the more commonplace products of the field, which are not, to the same extent, revolutionizing the markets of the country and the world, only because the profits on fruits are so much greater. Yet for the sake of their horses, hogs, cattle, and poultry, irrigators grow alfalfa, which under irrigation in western America has revolutionized forage production, multiplied the acre-yield of nutriment for stock, and tempted farmers of almost every eastern State into experiments, both with this jewel of the meadow itself and the improvement of other forage plants to meet the standard it sets.

Nor does the tale more than begin with the raising of standards

in products. Standards in methods of cultivation and care of fruit and vegetable, melon, and forage, soon follow and are even more stimulating to the intelligence and energy of men. Largely through the experience of irrigators, we are beginning to realize that what the country needs is not more acres in cultivation but more yield per acre cultivated; not more farms but more productive farms; not more orchards but more fruitful orchards; not bigger homesteads but happier homes, in which a little land gives a richer and more enjoyable living than that drawn from poorly tilled and larger acreage. Experts tell us that America's production of foodstuffs is not keeping so far ahead of population but that exports are declining and prices are rising. Yet, if we are to maintain our lead among the nations of the earth, we must prepare to feed twice, thrice, yes, ten times our present ninety-three millions, and this can only be done by so striking the soil that it will burst into multiplied fruitfulness, as burst the rock into water under the stroke of Moses' rod.

Toward this end the irrigated lands are moving more than all others; the irrigator soon learns that his water supply, rather than his land, measures his wealth, and turns his energies from miles of furrow to square rods of fruitage; it is he who first learned that one acre is better than two, because it drinks only one-half the water yet gives back twice the product. It is no miracle that new-settled acres in the land of sunshine and of irrigation ditches are valued at \$1,000 and \$2,000, and even more, while few farms or orchard lands in long-settled States have reached that many hundreds. This is due first to improvement in quality of products, but, second, and in even greater degree, to better methods of mixing brains with the soil and setting standards that are bound in time to spread afar and bless the entire country.

Even this hardly passes the threshold of Irrigation's gifts in higher standards. The improvement in method both demands and inspires larger vision, broader intelligence, and a more intensified individuality. And these, in turn, are still further fostered by that concentration of social life which follows a reduction in area and multiplication in the yield of homesteads. Under ideal irrigation, farms are small and neighbors near. A schoolhouse may be needed by the quarter-section instead of the township and a church by the section instead of the quarter county; so that schooling, public meetings, and social gatherings are all made convenient and thereby naturally become larger factors in daily life; the rural mail route is easily maintained because the patrons are many; the telephone may go into every house at little expense because there are many homes to each mile of line; while the same electric energy developed, it may be under a local or community project, will, without detracting one unit from its primary object, irrigation, not only lessen the "wear and tear" on the farmer, in the field and in the dairy, but also lighten the burdens and the drudgery of the housewife as well, thus contributing a maximum of revenue from a minimum of human vitality and energy; and, hence, in a multitude of ways conserving and uplifting, instead of exhausting and debasing, this and other generations. If humanity is to blossom all over this country, if this land of free institutions is to attain its manifest destiny, population must become concentrated, not in cities but on producing areas. This demands readjustment of social customs, social ideals, social standards, and the way for this social readjustment is opening through the influence of irrigation and the example of irrigated lands.

Take the rural road as an illustration. With the settlement of this country, roads soon grew up as means of ready communication between the settlers' families, whose very lives were often dependent on intercommunication; and the common ways virtually became the first public property in the Colonies, and, ever since, the road tax has ranked foremost among our taxes, whether met by tolls or by assess-

ment. Now the amount of the tax, and the weight of the burden on any community, is measured by the length of the road per family; and the goodness or badness of the road is fixed by the amount of tax the community can bear. Under irrigation, the homesteads are small, and hence are many for each mile of road, instead of one or two, as is the case in some rural sections. Consequently, the tax per capita is reduced, and yet the returns suffice to make better roads, to raise the standards of road-making, and thus secure cheaper movement of commodities from farm to town and back; easier movement of persons from house to house; better cared-for harness and vehicles; higher grade of draft animals and roadsters; superior standards of living; an improved taste and refinement in the growing generation; a better manhood and womanhood; cleaner social sentiments, and nobler ideals in daily life. Indeed, the common road strikes the keynote to our social progress, and no one can study the growth of road-making in the arid region, without realizing that the newer States have already attained to high standards, and that the solution of the road problem of the country at large is destined to be inspired by the standards developed under irrigation.

Nor does all this measure the gift of irrigation in the highest standards. When the dry lands were first explored, many there were who learned by bitter experience that their established standards of relative values were worthless, and that the absolute, fundamental value, the measure of life itself, lay in the water, without which no living being, animal or thing can survive. Many suffered the most horrible form of death, that from thirst. But the lesson was not lost on the survivors, who thus learned that not land but water, is the ultimate value, and that not gold, but human sympathy, and mutual support, and eventually solidarity, are the real riches, the very ends of existence. Thus new conceptions of human rights, new views of human law, grew up in the strong glare of desert sunshine; and there are those who to-day declare that the highest standards of equity and law, the clearest ethical conceptions, the soundest sense of relative values to be found among men, have arisen, and are still rising, in the arid portions of the country where irrigation sustains life, and that these standards are gradually spreading throughout the nation. One of America's students of human progress holds that civilization itself is the outgrowth, the inevitable and necessary offspring of the desert, through conditions operating on human conduct and thereby on the human mind. Yet even to the practical man of the day who takes time to observe and think it must be clear that standards of equity and legality are still arising in our own arid regions, and still influencing our national growth and character. To-day, as never before, burning questions confront the American people. These will begin to approach settlement soon after being raised and will be settled right; and no other section of the country can contribute more to right settlement than the arid region, vivified by irrigation, in which human life and the things most necessary for its maintenance are brought into direct connection and relation, and in which human sentiments and emotions are balanced with natural resources and conditions. The organisms of the desert are different from those of humid lands, in that they have been adjusted to more rigorous surroundings; their vitality is more intense and tenacious, and in like manner the human individuals and families of the one-time deserts have evolved, and are evolving, a clearer understanding of the essentials of existence than those of regions in which the relations between man and nature are less rigid. With the new relations arise new customs, new conceptions, new standards of righteousness among men; and these are bound to spread. Consequently, while the area is broad and the acres are many with which irrigation has enriched our country, the other gifts of irrigation are still greater, for it has given us new and better standards, industrial, social, legal.

mental, moral; and the perfect apple and luscious orange of the irrigated orchard, admirable as they are in themselves, may fitly be regarded as nothing more than symbols of the more elevated standards of human life traceable, after all, to the real gift of irrigation to humanity. (Applause.)

MR. CHARLES F. FISHBACK, of Chicago: Mr. President and Delegates, there are many thousands of people here and in the neighboring states, who would like to read this admirable address. Of course, extracts from it will doubtless be in the newspapers, and it will be published in the proceedings of this convention; but it seems to me that something more should be done. If possible, I think a large number of copies of this address should be struck off within the next day or two, so we can have them at hand at the entrance of the building during the sessions of the Nineteenth National Irrigation Congress, so that all who may desire may have a copy of it to take home and read. I believe if this address were put in the hands of Mr. Perkins, the chairman of our local committee on publicity, an arrangement could be made to print it, and I move that the president be requested to place the manuscript of this address in the hands of Mr. Perkins, so that many thousand copies may be stricken off during the sessions of this congress. I think a great many copies could be distributed to good advantage at the Land Show at the Coliseum building, so that the visitors there may have them to take home.

The motion was duly seconded and unanimously carried by a viva voce vote.

PRESIDENT FOWLER: The Chair will be very happy in putting the manuscript into the proper hands, as the Congress has just voted.

JUDGE HUTTON, of Los Angeles, Cal.: I move the letter from the President of the United States be answered by the proper officers of this Congress.

PRESIDENT FOWLER: I will say that we need not take any vote on that account, because that is customary with the Congress, and I will assume there will be no objection on the part of any delegate to the suggestion made by Judge Hutton.

The next order of business on the program, and I see our time is limited, is the report of the Executive Committee.

CHAIRMAN INSINGER: Mr. President, if it is convenient to all of us, I would suggest that we have the report this afternoon instead of this morning; if that meets your approval I so suggest.

PRESIDENT FOWLER: If there is no objection on the part of any delegate, as suggested by the chairman of the Executive Committee, the report of the Executive Committee will be taken up the first thing this afternoon.

Next is the adoption of rules for the Congress.

JUDGE HUTTON, of California: I move that the rules of the preceding Congress be adopted for this Congress.*

The motion was seconded.

PRESIDENT FOWLER: I think it is usual to adopt the rules of the preceding Congress, and that they shall be in force until others are substituted by this Congress itself.

The motion was carried by a viva voce vote.

PRESIDENT FOWLER: The next order of business is announcement concerning committees and instructions to state delegations, concerning appointments to be made by them. There is one thing all the delegates should attend to at the earliest possible moment. Each delegation should get together, select a chairman of the delega-

*These rules may be found in the appendix.

tion, select a member of the delegation to respond to the call of states, select the honorary state vice-president and also a member of each of the three standing committees, Credentials, Permanent Organization, and Resolutions. Those matters should be taken care of by each delegation as soon as it conveniently can, and report made to the Secretary of the Congress not later than to-morrow forenoon.

You should first select a chairman and secretary for the delegation; next select a speaker for the state when it comes to the call of states. Time will be given one afternoon on the program, and each state will have five minutes in which to respond to the call of the states.

I will say that the meeting held last year was in the evening, and, as you will remember, it was a very interesting meeting. Some of the five-minute talks were perfect gems, and it was so interesting we did not adjourn until long after eleven o'clock.

You should also select an honorary state vice-president of the Congress. You should select one member each of the three standing committees, Credentials, Permanent Organization, and Resolutions.

MR. HOLT, of Las Cruces, New Mexico: If the delegates will call at the Secretary's headquarters, at the Auditorium Theater, they will be provided with cards which give all the committees and the order in which they will be elected.

PRESIDENT FOWLER: The suggestion is a good one, that there are cards already prepared by the Secretary, I presume, for that very purpose. I will say that unfortunately the President was not aware of that fact, owing to another fact, that upon arriving here he was compelled to go to bed and stay in bed for two or three days. Otherwise he could not have been here to-day.

MR. R. H. FAXON, of Garden City, Kansas: I would like to inquire whether it is contemplated to begin the committee work earlier than to-morrow afternoon.

PRESIDENT FOWLER: I should not think it would be possible, Mr. Faxon.

MR. FAXON: My reason for inquiring was the thing that will naturally suggest itself to all members heretofore on committees on resolutions, and that is that it has been an almost interminable task, and the earlier the work is begun the better. Personally I was wondering whether any particular time had been set, or whether it might be advanced somewhat.

PRESIDENT FOWLER: No time has been set except the general time of to-morrow after the morning session. When the members of the committees have been reported to the Secretary of the Congress and then announced from the platform, so that the different states will know who will be on the various committees, then an announcement will be made calling the committees together for business.

MR. FAXON: Is it a fixed rule of the Congress, or is it a matter to be determined from time to time? I understand it is a constitutional duty devolving upon the President to form temporary committee organizations.

PRESIDENT FOWLER: The constitution requires the President to appoint a temporary chairman of the three standing committees.

MR. FAXON: That is a constitutional provision then?

PRESIDENT FOWLER: It is a constitutional provision, yes. The Secretary has some announcements.

SECRETARY HOOKER: Reference has been made to the card reports of action to be taken by the state delegations. These cards are here on my desk, and I believe you can also obtain them at the registration headquarters. These cards provide for the selections to be made by the state delegations. For your information I will state

that they do not mention the representative of the state who will respond on the call of states later on. That is not included on this card.

If the delegates upon organizing will fill these out and return them to the Secretary's desk as early as possible, it will enable us to compile our records and facilitate the committee work.

We have a notice here that the Colorado delegation will meet at 2:15 o'clock at Orchestra Hall for the purpose of organizing; it is signed by the secretary of the Colorado delegation.

The California delegation will meet and organize at the close of this meeting at the first box at the left of the stage.

Registration headquarters will be retained permanently in the Auditorium Theatre, although the afternoon meetings of the Congress, with the exception of Friday, will be held at Orchestra Hall. Friday afternoon's meeting will be at the Auditorium and the other afternoon meetings will be at Orchestra Hall. Registration headquarters will be maintained here. We have a postoffice, at which will be found mail addressed to delegates. Telegrams will be delivered here and announced from the platform, and if uncalled for here will be left at the postoffice. It would be well for delegates to make a practice of calling there once a day on the chance that there may be communications for them.

MR. SAMUEL H. LEA, of South Dakota: I wish to announce that the South Dakota delegation will meet at the South Dakota standard immediately after the session.

MR. T. U. TAYLOR, of Texas: I wish to announce that the Texas delegation will be called to order here immediately after the session. Several announcements similar to the foregoing were made.

MR. GALBRAITH, of Idaho: I move that all states meet at their respective standards, and any state expecting to meet at any other place may be announced by the Chair.

The motion was seconded and carried by a viva voce vote.

PRESIDENT FOWLER: Before we adjourn I wish to impress upon the delegates here the fact that the afternoon meeting is to be at Orchestra Hall. Do not allow yourselves to forget that during the recess.

The Congress here adjourned to meet at 2:30 o'clock at Orchestra Hall.

SECOND SESSION

TUESDAY, DECEMBER 5, 1911

2:30 o'clock P. M.

ORCHESTRA HALL

President Fowler called the Convention to order at 2:45 P. M.

PRESIDENT FOWLER: Gentlemen, the time is far past for calling the afternoon session to order. As you will remember, this morning we cut out a part of the program for lack of time, and the first thing to come before us this afternoon is the report of the Executive Committee, which will be made by the chairman of the committee, Mr. Insinger, of Spokane.

CHAIRMAN INSINGER, of Washington: Mr. President and delegates: Since the last meeting the Executive Committee has met a number of times. All the members of the Executive Committee, or the Executive Commissioners, from the different states, have been supplied during that time with a report of what was going on, and we have, by doing that, kept all of the different states in touch with what the national organization was doing. We have, as was stated this morning, built up the national organization and made it stronger.

Before making the regular official report of the Executive Committee, I would like to take this opportunity to draw your attention to one special point; the constitution provides for a kind of membership called permanent membership. This membership was instituted two years ago at the seventeenth meeting of the Irrigation Congress, and any man becomes a permanent member by contributing a small amount of money to the organization each year. This gives us a small working fund, because the organization continues each year and has work between sessions; so it is desirable that we have a large number of permanent members, not only from the fact that they are permanent members, but by contributing a small amount, they keep the treasury alive, and if later during the session it is the pleasure of the President to appoint, perhaps, a special committee to take up this matter, I for one would be very glad to see something done to make the permanent membership a more usual thing in this organization than it now is, for I believe it will make the organization stronger and richer.

In presenting to you, Mr. President and delegates, the report of the Executive Committee, I am going to do, as I did last year, and depend upon the splendid voice and delivery of my friend, Dr. McGee, and ask him to read it to you, with your permission.

The report of the Executive Committee was presented and read by Dr. W J McGee as follows:

REPORT OF THE EXECUTIVE COMMITTEE of the NINETEENTH NATIONAL IRRIGATION CONGRESS

Pursuant to announcement from the Chair just before adjournment of the Eighteenth National Irrigation Congress, the Executive Committee for the Nineteenth Congress met in the Mineral Palace, at Pueblo, 2:45 p. m., September 30, 1910; and Mr. R. Insinger, of Spokane, Washington, was unanimously chosen temporary chairman. On roll call there were found present members of the committee from Arizona, California, District of Columbia, Connecticut, Illinois, Kansas, Missis-

issippi, Montana, Nebraska, New Mexico, Ohio, Oklahoma, South Dakota, Utah, Washington and Wyoming.

The committee proceeded to organize by electing Temporary Chairman Insinger permanent Chairman, and choosing Mr. Arthur Hooker as Executive Secretary; and on motion of Governor Kibbey, of Arizona, the Chairman was empowered to select three members-at-large for the Board of Governors to act in conjunction with the President, Secretary and Chairman of the Executive Committee, together with the prospective Chairman of the Board of Control.

By unanimous vote the Board of Governors was then instructed to act on behalf of the Executive Committee, to report their actions promptly to all members of that committee, and to exercise full power until or unless a meeting of the Executive Committee should be deemed necessary.

The Chair announced his appointees for members-at-large of the Board of Governors as Col. W. S. Hopewell, of New Mexico; Dr. W. J. McGee, of the District of Columbia, and Mr. W. G. DeCelle, of Illinois; and in announcing the initial meeting of the Board of Governors for the same evening, he invited the attendance of all members of the Executive Committee remaining in the city—an invitation accepted by several, so that the first meeting of the Board of Governors, held in California Headquarters at the Congress Hotel in Pueblo on September 30, was substantially a meeting of the Executive Committee.

By reason of frequent and complete reports from the Board of Governors, no occasion for ad interim meetings arose; and pursuant to a former call, conformably to the constitutional provision, the next meeting was held in Hotel La Salle, Chicago, Illinois, beginning 5:00 p. m., December 2, 1911.

At the initial session of this meeting a draft of the preliminary program submitted by the Board of Governors was received and informally discussed, no other business being transacted; there being present (including members of the Board of Governors) representatives from Arizona, Colorado, District of Columbia, Illinois, New Mexico, Ohio, South Dakota and Washington.

An adjourned session for the transaction of general business was held in Hotel La Salle 11:30 a. m., December 4. Representatives (including the Board of Governors) were present from Arizona, California, Colorado, District of Columbia, Illinois, Mississippi, New Mexico, Ohio, South Dakota, Texas and Washington. In addition to the transaction of routine business, the Report of the Board of Governors (including the program for the Nineteenth Congress and proposed amendments to the Constitution) was adopted; and a committee was appointed to prepare a draft of this report to be submitted at an adjourned session in the Auditorium Parlor at 9 a. m. December 5.

ORGANIZATION OF THE CONGRESS

Proceeding along lines discussed at the Fifteenth Congress and taken up at the Sixteenth, the organization of the national body has gradually been made more definite, with the object of insuring its perpetuity and increasing its influence as a power for the good of the semi-arid region and the country as a whole. Experience shows that the transaction of current business by a duly empowered Board of Governors subordinate to the Executive Committee relieves the responsible committee members from anxiety and labor, and more or less frequent meetings; while the prompt reports sent by the officers to each member of the Executive Committee, both by letter and in the form of printed records, keep alive the interest and enthusiasm of the entire committee.

It will be recalled that in the interests of more permanent organization considerable changes were made in the Constitution at the Spokane Congress, and that a few were made also at the Pueblo Con-

gress; and with a view to the same end and also to the simplification of procedure in transacting necessary business by the Congress at large, a few additional changes in the organic law are reported and recommended to the favorable consideration of the Congress.

BOARD OF GOVERNORS

The Board of Governors report six meetings for the transaction of business, chiefly growing out of the arrangements for the Chicago Congress. At all of these meetings (which comprised over twenty sessions, some held jointly with the Board of Control) a majority of the Board were present, and at most of the sessions the entire Board participated.

BOARD OF CONTROL

In accordance with the invitation extended at Pueblo, and in conformity with the Constitutional provision, citizens of Chicago organized a local Board of Control toward the close of 1910; the Board was finally organized with Mr. Robert R. McCormick as Chairman, Mr. Harvey C. Vernon as Treasurer, and the Secretary of the Congress as Secretary, with Messrs. E. T. Perkins, Frank E. Scott, W. L. Park, John C. Shaffer and Dr. W. A. Evans as chairmen of sub-committees and members of the Executive Committee of the Board.

The energetic and efficient action of the Board of Control is attested by the arrangements for the present Congress, which speak for themselves. Neither the public nor all of the delegates to our successive Congresses realize how largely the success of any meeting depends on the local Board, whose members commonly work quietly and take no conspicuous part—even when they participate at all—in the public deliberations; yet, to their fidelity and zeal the success of the entire meeting is largely due. Accordingly, it is a special pleasure thus publicly to acknowledge our great debt to the business men and the commercial and other organizations of Chicago who formed and sustained the Board of Control.

PROGRAM

The program for the Nineteenth Congress was prepared by the Board of Governors with the active and effective co-operation of the Board of Control. It was received by the Executive Committee at the session held December 2 and adopted at the adjourned meeting on December 4, and is now in the hands of delegates.

It will be observed that while the customary greater number of addresses provided pertain strictly to irrigation, a number deal with other uses of the waters and with social, sanitary and other conditions arising in connection with these uses. In large measure, these extensions have grown out of the ever-widening influence of irrigation on our national life. As time passes it is increasingly apparent that irrigation, which began in a small way in special localities, is opening a new chapter in our industrial development, if not, indeed, a new era in our history, for it is not so much our breadth in land and our wealth in minerals that measures our strength as the water supply, on which alone rest the productivity and habitability of the country. In fact, the control of water for irrigation in arid valleys is extending into the more humid States, where the right use of water at just the right time is increasing production, and thence to regulation of the natural movement of the waters in such manner as to afford domestic and municipal supply, develop power, promote navigation, and remove the excess from swamp and overflow lands. With this extension in the control and use of the natural waters of the country, the National Irrigation Congress is, and should be, in hearty sympathy, for it was this organization more than any other agency that initiated the advance and fostered its early progress. Irrigation prepared the way for better use of our

natural wealth in waters; the advance has been more rapid than the most enthusiastic pioneers dared to dream, and it is no longer possible, even if it were advisable, to limit the movement for so controlling our waters as to most richly benefit the entire country. Neither is it possible or desirable to narrow the scope of discussion in the Congress of the constantly increasing industrial and social interests attending better use of waters. These considerations influenced the Board of Governors in the selection of speakers and subjects, and the program, as a whole, accordingly marks the widening field of irrigation. As shown in the President's address, irrigation's best gift is improved standards, social and ethical, no less than industrial, and it is in a peculiar degree the province of this Congress to make those better standards known.

In their report (which is appended and made a part hereof) the Board of Governors explain the relatively large space given to the subject of drainage and the unexpectedly limited space devoted to irrigation securities and other financial aspects of irrigation.

PROPOSED AMENDMENTS TO THE CONSTITUTION

As the field of the National Irrigation Congress widens and its interest grows it is constantly necessary to render more definite and unmistakable the provisions of the organic law, and at the same time to provide so far as may be for the perpetuity of the organization. It was for this reason that considerable changes in the Constitution were made at Spokane, and lesser changes at Pueblo, while a few are now proposed. It should be noted that the changes incorporated and explained in the following paragraphs are designed either to rectify verbal errors or to simplify provisions which have occasioned uncertainty and embarrassment in the past. No substantially new legislation is embodied in the proposed changes; they are essentially formal in character and purpose.

It may be noted that essential changes in the provisions for voting have been submitted to the Executive Committee, and have led to a recommendation that our successors create a special committee to consider this subject with a view to action at the next Congress.

The amendments now proposed and recommended for favorable action by the Congress are as follows:*

ARTICLE V

Amend Section 1 by substituting in the first clause for the words "consisting of" the word comprising; so that the clause shall read: There shall be an Executive Committee comprising one member from each State selected by the delegation thereof.

Amend Section 1 further by substituting in the third clause for the words "President and Secretary" the words **President, Secretary, and all Ex-Presidents of the Congress**; so that the clause shall read: **The President, Secretary and all Ex-Presidents of the Congress shall be ex-officio members of the Executive Committee.**

ARTICLE VI

Amend Section 4 by substituting in the last clause for the words "two days" the words **the day**; so that the clause shall read: **The entire program, including allotments of time to speakers and hours for daily sessions, shall be referred to the Executive Committee for ratification not later than the day before the opening of each session of the Congress.**

*The proposed amendments are printed as altered by the Congress on December 5, 1911 on motions offered by Messrs. Fairweather and Insinger, and in the form in which they were adopted by the Congress. A further amendment to Article VI was adopted by the Congress at the morning session December 9. The revised constitution appears in the appendix.

ARTICLE VII

Amend Section 1 by substituting in the clause numbered (5) for the words "and from each college and commercial body" the words from each college, and from each commercial body and club concerned with public interests which has been duly organized not less than one year; so that the clause shall read: (5) two delegates from each incorporated town having a population of less than one thousand, from each regularly organized association devoted to irrigation, agriculture, horticulture and engineering, from each college, and from each commercial body and club concerned with public interests which has been duly organized not less than one year.

Amend the same section further by inserting in the clause numbered (8) after the word "committees" the words members of the Executive Committee, Honorary Vice-Presidents, members of the Board of Control; so that the clause shall read: (8) all officers, chairmen of committees, members of the Executive Committee, Honorary Vice-Presidents, members of the Board of Control, and permanent delegates to the Congress.

ARTICLE VIII

Amend by inserting, after Section 1, to form Section 2: Sec. 2. On organizing or soon as may be thereafter, each State delegation will choose a member of the Committee on Resolutions and a member of the Committee on Permanent Organization to act throughout that session of the Congress, and a member of the Executive Committee for the ensuing year whose duties may begin with the close of the session; and in the absence of the member of the Executive Committee for the State at the opening of the Congress for which he was chosen, the delegation may select a substitute.

Amend further by numbering the present "Sec. 2." Sec. 3.

ARTICLE IX

Amend Section 2 by substituting for the words "provided (2), that when a State is represented by less than ten delegates, said delegates, if all present, may cast ten votes for such State; and provided (3), that if a part of the delegation of such State are absent, those remaining may cast their pro rata of ten votes" the words and provided (2), that any State having five delegates or less registered and present shall be entitled to five votes; so that the section shall read, Sec. 2. A division may be demanded on any action by a State delegation or a ballot by an apparent majority of the delegates present; on division or ballot each member shall be entitled to one vote; provided (1), that no State shall have more than twenty votes, and provided (2), that any State having five delegates or less registered and present shall be entitled to five votes.

Amend further by inserting the following to form Section 3: Sec. 3. Any State delegation may divide its vote in the ratio of duly registered delegates present at the time of voting; provided, that such division shall be stated in whole numbers.

Amend further by numbering the present "Sec. 3" Sec. 4.

EXPLANATION OF PROPOSED AMENDMENTS

The purpose of the first amendment in Article V, Section 1, is merely to rectify a verbal error involving a slight inconsistency in the provision of the Section; and the purpose of the second amendment in the same Section is to strengthen the Executive Committee by including within it the Ex-Presidents of the Congress—men whose experience and sound judgment may properly be thus made available in the interests of the organization.

The purpose of the amendment in Article VI, Section 4, is merely to rectify a verbal error (which apparently crept in during the Spokane

Congress) and render the provision of this Section congruous with those of other Articles and Sections.

The purpose of the first amendment to Article VII, Section 1, is partly to qualify the provision concerning commercial bodies entitled to representation by the specification that only those concerned with public interests shall be so entitled, but chiefly to provide for adequate representation from other bodies concerned with public interests though not necessarily commercial in character—e. g., farmers' organizations, women's clubs, associations for civic betterment, etc.

The purpose of the second amendment in the same Section is to establish the right of members of the Executive Committee and Honorary Vice-Presidents to participation in the Congress wherewith they are officiating, whether or not they may be otherwise accredited to that Congress.

The purpose of the amendment to Article VIII is to remove ambiguity and the uncertainty which has been found to arise in delegations as to whether all the committee members shall or shall not be selected at the same time, and to obviate the need on the part of delegations to either have the Constitution before them or be thoroughly familiar with its provisions at the time of organizing. Section 1 as it now stands provides for the organization essential to the integrity of the Congress, and it is accordingly put in mandatory form; but since the Congress is the creature of delegates and delegations, it may be deemed optional with each delegation whether or not it shall exercise its right to take part in that committee work, etc., not essential to the integrity of the Congress, so that the provisions of the proposed Section 2 are put in the directive rather than mandatory form, just as the provisions of the former Section 2 (the proposed new Section 3) are expressed in the permissive form.

The amendment in Section 2 of Article IX is designed to simplify that section and render it easily interpreted by every delegate in the manner shown to be necessary by experience at Pueblo. It will be noted that the third proviso which occasioned embarrassment at Pueblo is entirely eliminated.

The new section in Article IX is designed to meet questions which were found to embarrass and delay procedure at the Pueblo Congress, including the question as to whether the "unit rule" was either authorized or imperative. It specifically limits voting on division of the delegation to those present, and provides a rule for so reckoning the division that it shall (1) be satisfactory to the delegation, and (2) relieve the Secretary or other officer from the burden of complex calculation.

RULES FOR THE CONGRESS

The Executive Committee recommend that the rules for the guidance of the Congress as adopted at the Spokane session and modified at Pueblo be adopted for the present session. These rules are appended.*

ACKNOWLEDGMENTS

In thus reporting the performance of duty assigned, and in transferring to the entire Congress the responsibilities imposed at Pueblo, the Executive Committee desire to express special acknowledgments, first, to the Board of Governors for the faithful and effective manner in which they have discharged their obligations, including that of keeping the members of this Committee fully advised of their actions; and, second, to the Board of Control for the energy and intelligence manifested in the arrangements for the Nineteenth Congress. It is fitting, too, to especially acknowledge our debt to the President, Secretary and other officers of the National organization, for their work, enhanced

*For greater convenience for reference the rules adopted for the Nineteenth Congress are placed in the appendix, following the Constitution.

as it was by unforeseen conditons, has been unremitting, effective, and no less vigorous than discreet. Finally, we acknowledge for ourselves and on behalf of the Congress a deep obligation to the people of this great city—the throbbing heart of the interior—for that measure of interest and support upon which the success of this Congress must depend.

Respectfully submitted,

(Signed) R. INSINGER,

ARTHUR HOOKER,

Chairman.

Secretary.

REPORT OF THE BOARD OF GOVERNORS

Appended as Part of

THE EXECUTIVE COMMITTEE REPORT

The Executive Committee of the Nineteenth National Irrigation Congress:

The Board of Governors have the honor to report progress up to the point of such completion of their work as to permit transfer of their duties and responsibilities to the full Executive Committee.

MEETINGS

The first meeting of the Board was held pursuant to announcement at the organizing meeting of the Executive Committee, the first session taking place in the California Headquarters at the Congress Hotel, Pueblo, Colo., 4:15 p. m., September 30, 1910; there being present, in addition to the Governors, members of the Executive Committee from California, Connecticut, Kansas, Minnesota, Ohio, and Utah. At this session representatives of the City of Chicago, who had extended the invitation to hold the next Congress in that city, were present and outlined the facilities which Chicago possesses for suitably entertaining the Congress, and the facilities appearing adequate and the financial guarantee satisfactory, a contract with them was prepared and in part executed. At a second session, also held in the Congress Hotel at Pueblo on Friday evening, September 30, routine business was transacted.

The second meeting, held pursuant to adjournment and formal call, began in room 1009, La Salle Hotel, Chicago, at 6 p. m., December 1, 1910; there were seven sessions, the last during the afternoon of December 3. In addition to routine business, many details concerning arrangements for the Nineteenth Congress received consideration and action, several sessions being held jointly with the newly organized Board of Control.

A third meeting was held pursuant to formal call in the Commercial National Bank Building, Chicago, in two sessions, the first during the afternoon of December 20, and the second during the morning of December 21, 1910. Various matters touching the relations between the Board of Governors and the Board of Control were considered and determined.

The fourth meeting began, pursuant to call, in room 310, La Salle Hotel, Chicago, at 3 o'clock July 10, 1911. It extended over five sessions, the last during the afternoon of July 13. Several of the sessions were held jointly with the Board of Control, and in addition to

prolonged consideration of the relations between the two bodies, resulting in some changes in the organization of the local Board, the program for the Nineteenth Congress was considered, speakers were selected, and suggestions by delegates concerning changes in the constitution shown to be desirable by experience at Pueblo were considered.

The fifth meeting was held pursuant to call in the La Salle Hotel, Chicago, beginning September 29, and after nearly continuous sitting in several sessions, closed October 3, 1911, some of the sessions being held jointly with the Executive Committee of the Board of Control, of which a reorganization was about this time perfected. Special consideration was given the program, including arrangements for the Nineteenth Congress.

A sixth meeting was held pursuant to call in the La Salle Hotel, Chicago, at 2 p. m., December 1, 1911. There were present all members except Chairman Insinger and Mr. R. R. McCormick, Chairman of the Board of Control. The chief business was the revision of the preliminary program to date and the preparation of this report.

Full minutes of the several meetings were kept, and (up to the last meeting) these were put in print, and, soon as might be afterward, sent to each member of the Executive Committee, and a copy of the complete record thus kept and printed is attached hereto. As the record shows, a quorum of the Board was present at every session, and most of the sessions were attended by every member.

OFFICIAL CALL

The Official Call for the Congress was prepared during the fifth meeting of the Board, and was soon afterward issued in an edition of 35,000 copies. It was sent to State and other public officials, to the members defined in the Constitution, and to various organizations in every State; and it is gratifying to report that the responses have been more numerous than for any previous Congress.

DATE OF THE CONGRESS

By reason of conditions not foreseen at Pueblo connected with the convenience of the Board of Control, it was unexpectedly found desirable to hold the Nineteenth Congress at an unusually late season of the year; and in conformity with custom the date was announced publicly soon after it was determined. Subsequently it was learned that in some cases the lateness of the date interfered with the usual arrangements for railway transportation—a regrettable circumstance, growing out of local conditions, which will doubtless guide future Boards in their arrangements for prospective sessions of the Congress.

PROGRAM

A preliminary draft of the program for the Nineteenth Congress is submitted herewith. It provides for addresses by experts in irrigation and allied matters, for free discussion by delegates, and (with somewhat exceptional fullness) for responses by representatives chosen by state delegations in a Call of States. It has been the aim of the Board to recognize the growing interest in irrigation, not only throughout the semi-arid region, but in the humid portions of the country, in which it is becoming more and more evident each year that better control of the life-giving water is essential to full development of production and population. Accordingly, more space has been assigned to the collateral and incidental aspects of water control for the general welfare than might be appropriate in a strictly irrigation center, although, as usual, the greater number of addresses and papers bear directly on irrigation and immediately concern our semi-arid section.

It is proper to add that in one respect the Governors have been disappointed in arrangements for the program. It was understood at Pueblo that the chief reason for coming to Chicago lay in the evident and growing desirability of bringing together the industrial interests growing out of irrigation in the Western States, and the commercial interests arising in one of our leading financial centers; and it was the constant purpose of the Governors to provide for and secure the delivery of addresses and discussions pertaining directly to irrigation securities and related matters. Unhappily for reasons which need not be recounted—reasons in some cases personal and in others connected with the nation-wide commercial conditions—the several expert authorities consulted generally found it impracticable to participate actively in the Congress, some of them reaching the decision only at so late a day that it was impossible to find suitable substitutes.

DRAINAGE

For some years past the Irrigation Congress has given increasing attention to drainage, as in many cases a necessary complement of irrigation; and at the Pueblo Congress a broad resolution advocating the extension of drainage to the swamp and overflow lands of the country in the interests of the general welfare, was adopted. Largely in conformity with this policy of the organization, partly by reason of a well-founded desire on the part of the Board of Control, exceptional space has been given in the program and doubtless will be in the deliberations of the Congress to the subject of drainage as a live national question. The Governors incline to the view that at the present juncture this is a wise course. Through the efforts of the National Irrigation Congress, more than by any other means, the idea of complete control of the natural water supply for all useful purposes, beginning in the semi-arid region, has extended throughout the length and breadth of the land; and naturally, unless other organizations arise to foster this idea fundamental to our national progress, a duty in this regard would seem to devolve on the National Irrigation Congress. The duty is only the greater by reason of the fact that through experience in the reclamation of dry lands by irrigation, new business methods and new standards have grown up which may well guide progress in drainage and other means of water control in the more humid States.

SPECIAL WORK OF THE CONGRESS

Largely through the efforts of this national organization, the Federal Reclamation Service was initiated and put in operation; and one of the evident duties of the organization is to continue fostering that Federal work and, through the experience of members, so aiding in the direction of its development as to secure the greatest possible benefits both for the West and for the country as a whole. Largely through the inspiration awakened in the successive sessions of this body, various States have been led toward legislative and administrative action promoting the welfare of their citizens; and it is fitting that activity in this direction should continue. Pursuant to a resolution adopted at the Spokane Congress, the Census Bureau, acting under a special enactment of the Federal Congress, undertook a complete census of irrigation enterprise, reported progress at Pueblo, and will at this Congress report results (so far as complete) through Special Agent Teele. In these and other directions, it is gratifying to note, the influence of the National Irrigation Congress in promoting the public welfare seems to be steadily increasing.

AMENDMENTS TO THE CONSTITUTION

Moved by experience at Pueblo, several delegates have proposed minor modifications in the organic law of the Congress, and these have been carefully considered by the Board of Governors both through a special committee and in full session. Certain proposed amendments have been approved, and are submitted herewith. It is recommended that, if approved by the Executive Committee, they be incorporated in the report of that committee and submitted to the Congress at its opening session.

A financial statement is appended.*

(Signed) R. INSINGER,
Chairman.

ARTHUR HOOKER,
Secretary.

CHAIRMAN INSINGER: Mr. President and Gentlemen: I do not know whether the applause was intended for the Chairman or for the gentleman who read it. I think it is due to the gentleman who read it, because, as you all know, Dr. McGee was on the subcommittee which drafted the report after the meeting that we had last Saturday and yesterday. Mr. President, I move you that this report be adopted. I do so to bring it before the House, because there is no intention to prevent any discussion whatever.

The motion was seconded.

PRESIDENT FOWLER: It is moved and seconded that the report of the Executive Committee be accepted and adopted. Are there any remarks on this motion?

MR. JAMES F. PECK, of California: May I ask the reason for making the past presidents ex-officio members of the Executive Board? The reasons, I believe, are included in the report, but were not read.

PRESIDENT FOWLER: The reasons for adding the past presidents to the Executive Committee will be stated by Mr. Insinger.

CHAIRMAN INSINGER: The reasons are rather apparent. At the present time any man who has been president of this organization, and therefore has been identified with it, is often dropped entirely from the working part of the organization, and as he has very valuable knowledge, his services are lost to the organization. For instance, if my friend, the President, will allow me, suppose someone is made Executive Committeeman of a state other than some one person present at this session—if the President will permit me—someone else besides himself. We would lose the valuable aid of President Fowler. We have lost the valuable aid of every president that we have had, because they have not been made Executive Committeemen from their states. So, in order to keep them interested in the work, we propose that they be made Executive Committeemen from their states.

There is no danger of swamping the Executive Committee; there is no danger of doing that. The Executive Committee consists of members from the states represented at the Congress. We have had as many as forty, or a higher number, from the states represented. A few extra names on the committee will not have any undue influence against other states and will add a considerable amount of experience toward the conducting of the work of the Executive Committee.

MR. PECK, of California: May I ask what number there is to be appointed or elected regularly?

CHAIRMAN INSINGER: Every state represented appoints one Commissioner. At the session in Pueblo we had something like forty states represented. Each state elects an Honorary Vice-president, whose title is honorary. He does not take any active part, except

*A financial statement is printed in the appendix.

such part as he sees fit to take in his state, to keep interest alive, as it is the Executive Committeeman who represents the state on the governing board. This year thirty-two states have members on the Executive Committee.

MR. ROBERT M. WOODS, of South Dakota: I move that the motion be amended so that the recommendations made by the Executive Committee for amendments to the constitution be and are hereby adopted as a part of the constitution by this Congress.

PRESIDENT FOWLER: You are aware, perhaps, that there is a motion before the House that the report of the Executive Committee be adopted. That is the idea that is covered by your motion, as I understand it.

MR. WOODS: Yes, so I understand.

PRESIDENT FOWLER: Before that motion is put I think it would be helpful for the delegates present to have me read them the names of the living ex-presidents of the National Irrigation Congress, and those who live in this country. We all know that Elwood Mead is in Australia and is doing good work there. C. B. Boothe, of California, whom we fortunately have with us this afternoon, is ex-president of the Fifth Congress.* Governor Carey, of Wyoming, was the president of the Sixth and also of the Seventh Congress, and I have a letter from him expressing his regrets that he was not able to be here. Senator Clark, of Montana, was president of the Eleventh and Twelfth Congresses. Governor Pardee, of California, was president of the Thirteenth and Fourteenth Congresses. Senator Chamberlain, of Oregon, was the president of the Fifteenth Congress, and Judge Goudy, of Denver, was president of the Sixteenth Congress. Ex-president Barstow, of Texas, was president of the Seventeenth, and that makes up the entire list of those who have been presidents and are now ex-presidents, who would be included in the report of this committee.

Without making any personal reference to myself, I hope I may be allowed to say that when any man has been president for one year of this Congress and has faithfully attended to the duties that devolve upon him, he has undoubtedly gained an experience and a knowledge and a wide acquaintance throughout the country, from Maine to California, that is valuable to the Congress, as well as to himself, and I see no reason whatever why the Congress should lose that experience and that knowledge thus gained, in some instances at the expense of a good deal of money and hard work and faithful observance of the duties of the position—I see no reason why this Congress should lose the advantage of all that accumulated valuable experience. I am only expressing my personal opinion now, but I think there is not one in the house but what will agree with me, that that ought to be subject to the call of the Congress and as I understand the report of the Executive Committee, that is the object, so far as it relates to the past presidents.

Now, the motion is before the Congress. Are there any remarks on this motion?

JUDGE JOHN FAIRWEATHER, of California: There is one section of the proposed amendments, on the voting proposition, that I do not like.

PRESIDENT FOWLER: Spit it out, Judge.

JUDGE FAIRWEATHER: Well, that was what I was about to do. I shall before I get through. A good many of those present know

*This information appears in some earlier official proceedings, but at the Thursday morning session the records of the Congress were corrected to show that C. B. Boothe, of California, was the president of the Fifth and Sixth Congresses, and Governor Carey was president of the Seventh Congress.

that at Pueblo last year we had quite a discussion about the voting proposition. It has caused considerable agitation year in and year out, and here I have suggested an amendment to Section 2 of Article IX on voting. As we vote here, Rhode Island, Connecticut or Massachusetts may have one delegate here and cast ten votes, while a state that has fifteen or twenty delegates can only cast that number of votes. All we ask is justice—

CHAIRMAN INSINGER: Will you allow me to interrupt?

JUDGE FAIRWEATHER: Certainly.

CHAIRMAN INSINGER: A delegation having fifteen members will have fifteen votes. The votes will go according to the number of delegates registered.

JUDGE FAIRWEATHER: To cut it short, I move you that Section 2, of Article IX, shall read that any state having less than five delegates present, or less than ten, shall only cast five votes—or, put it this way: any state having five delegates present—registered delegates—five, or less, shall cast five votes. To make it plain, any state having less than twenty, above five, each delegate registered present shall cast one vote. That is, if there are ten present, they shall cast ten votes; if twelve present, they shall cast twelve votes; if there are sixteen present, they shall cast sixteen votes, and no matter how many are present from any state, they shall not cast over twenty votes. If I can get a second to that motion—and I hope I may. I do not believe it is right—last year we had one delegate present who cast ten votes, while other states present had ten or twelve delegates present and cast only fifteen votes; and I hope the Congress will sustain me in that proposition, to amend section 2 on voting. I think you will understand me. I will state it again; that any state having less than five delegates present shall cast only five votes, instead of casting ten.

PRESIDENT FOWLER: I think we understand you.

CAPTAIN GEO. W. HANCE, of Arizona: Mr. Chairman, I am the only representative from Arizona, and I second the amendment.

DR. W J McGEE, of Washington, D. C.: Mr. President, may I have your ear for a moment, merely to call attention to the fact that the motion by Judge Fairweather does not come up anew to the Executive Committee. You may recall that in reading the report of the Executive Committee a paragraph was devoted to recommendations that have been made to the Executive Committee during the past year for some such changes in the law relating to voting, as Judge Fairweather has stated. I should like to add that Judge Fairweather himself favored the Executive Committee by his presence at the next to the last meeting and made the proposal before the Committee that he has now made and that the committee were in large sympathy with his proposal, and that it was for that reason, and that reason alone, that the Executive Committee have incorporated in their report the recommendations that our successors in office, that is, the Executive Committee for next year, appoint a sub-committee to investigate fully, deliberately, and carefully the whole subject matter of voting, with the idea that at the next Congress a more equitable method than the present one will be adopted, not hastily and inconsiderately, but as the outgrowth of careful deliberation—a committee which ought to act during the year. I merely call attention to this fact as seeming to me, in considerable measure, to meet the point which Judge Fairweather has raised.

MR. C. M. WOOSTER, of California: It seems to me that there is no necessity of waiting in order to prescribe the method of voting, when so fair a proposition as that by Judge Fairweather is presented.

I think we can vote upon that question, and if the Executive Committee can present a better or a more fair status at the next meeting, it can be adopted.

CAPTAIN HANCE: I voted for it four years ago. At that time we had several thousand people. Now we have 205,000, and irrigation has built up that number. The fact of irrigation is the only thing that we have got. I have come here at my own expense. I did not ask anybody to give me a cent. And I think if Arizona has got representative men here, I do not think that we would be entitled to any more votes than other states that are well drained. We ought to all come on an equal footing, to boost the American Nation, and I for one want to see the work carried on. This is the first time that I have ever got up to speak at the Congress, in all of the five times that I have been in attendance as a delegate. I think that I am the only one here—

PRESIDENT FOWLER: I want to say for the relief of Captain Hance that there are half a dozen other delegates here from Arizona. I want now to recognize the gentleman from New York.

MR. E. W. CATCHPOLE, of New York: Mr. Chairman and Gentlemen: I am heartily in sympathy with the statement made by the gentleman on the platform. The experience of other national bodies would indicate that it is well for us to go slow in this matter. I am very much in favor of the plan of taking a year to consider this matter, and devise a plan which will work out best for the interests of this Congress. The Farmers' National Congress and other bodies have had trouble along this same line.

PRESIDENT FOWLER: Let me say, before I recognize Mr. Bohm, that the National Irrigation Congress stands for the fullest expression of its members. The Chair will patiently listen to anything within the bounds of reason, because the Chair believes that there should be no unnecessary cutting off of discussion, for it is only by discussion and the frank expression of the ideas that we have that we can get into the right course and do the right thing.

MR. E. F. BOHM, of Ohio: I want to fortify what Dr. McGee said a few moments ago, having been present myself as a member of the Executive Committee, at which, after full deliberation, it was unanimously decided that this was a matter that should be allowed to wait, not for any ulterior purpose, but because we decided it best, and I think everybody after consideration will agree with us that it is a thing that cannot be decided rightly over night, and it cannot be decided and justice done to it at such a gathering as this. As far as the merits and the principle involved are concerned, I am very much opposed to any such segregation as Judge Fairweather proposes. Without going into specific details, it is unfair. If I may be permitted to cite my own experience, as the chairman knows, I have personally paid my own expenses in traveling across the country five times. As far as my position in representing the state of Ohio is concerned, or the country at large, I believe I am as much entitled to represent Ohio in voting as any other state here represented by twenty delegates.

MR. G. E. CONDRA, of Nebraska: I wish heartily that we might not be in a hurry just now. This is a National Irrigation Congress annual meeting, and I do not think the officers of the Congress want anything but harmony. If those who are to take up irrigation and drainage want the assistance of all the people, don't you think that we would better not start in with a quarrel? Don't you think that we should take the recommendation before us? We stand for national policies. Let us not go to the extent that Ohio, New York, Vermont, and the other states down East would say that we should not do this

or that or some other thing that the states of the West say that we should do.

PRESIDENT FOWLER: Gentlemen, the Chair wants to say a word, and that is, that there is going to be no quarreling in the National Irrigation Congress. There may be honest differences of opinion, and we will air those differences of opinion, and then we will come to a conclusion, but don't let us think for a moment that we are going to lose our patience, that we are going to lose our good feeling or have any quarrel at all. I want to recognize next my friend from California, Mr. Peck.

MR. JAMES F. PECK, of California: I have just a word to say in support of Brother Fairweather's position, and that is this: it occurs that the resolution is offered as a tentative resolution at this meeting. It would not make any difference whether you adopt it at the next Congress or not. It does seem that it was up for discussion at the last meeting, and it seems to be passed up from Congress to Congress. The proposition of Brother Fairweather is to settle it. I know nothing that is coming before this Congress, but the votes that are to be cast should be cast on the basis of equality, without giving any state a preponderance of power in the Congress. These questions are merely coming up so that the next Congress may settle them.

MR. GEORGE AUSTIN, of Utah: I am heartily in favor of the amendment proposed by the gentleman from California. I think it is very fair, that if any state has but one delegate, that it shall have five votes in this convention. There are many here who have come fifteen hundred miles, with strong delegations. What for? To represent their people from that state, and I think that if ten delegates have only ten votes, and one delegate from a state has ten votes, it is a premium to stay home and do our work by proxy. (Applause.)

PRESIDENT FOWLER: The amendment is before the Congress.

A vote was then taken upon the amendment, and the same was carried.

PRESIDENT FOWLER: We now come to the original motion as now amended.

The original motion, as amended, was then voted upon and carried.

PRESIDENT FOWLER: The Committee's report, as amended, is adopted.

CHAIRMAN INSINGER: Mr. President, it has been suggested to me, since the report has been made, that we ought, in justice to the city in which the Congress is held, and I don't mean this particular city, but any city in which the Congress is held, make a provision that the local members of the Board of Control shall be ex-officio delegates to the Congress. I do not think there would be any injustice done to the Congress, but it would often make it more convenient for the people of the city which is the host and who take the trouble to become members of the Board of Control, that they should be ex-officio members of the Congress, when going to see the Mayor, or calling upon agricultural societies, or anything of that kind.

PRESIDENT FOWLER: The President desires to add that they also put up the money, which is also very acceptable and desirable to us.

CHAIRMAN INSINGER: If in the opinion of the delegates present it seems a fair provision, I would like to move that there be added a clause to Section 8, as follows: That all members of the Board of Control shall be ex-officio delegates to the National Irrigation Congress.

PRESIDENT FOWLER: I believe in reciprocity. I think the suggestion made is a good one, and that it would be only proper courtesy on our part, to make the members of the local Board of Con-

trol ex-officio members of the Congress. That does not increase the votes of the state in any way. Perhaps it is not the province of the Chair to argue in this manner, but I only wanted to explain that I think reciprocity and courtesy would demand that we do this.

The motion, having been duly seconded, was upon vote, unanimously carried.

PRESIDENT FOWLER: We were to have a paper entitled "Achievements of the National Irrigation Congress," by ex-Governor George C. Pardee, past president of the Congress, chairman State Conservation Commission of California. I was pained a few hours ago to receive from Governor Pardee the following telegram, and I will explain a little the ground of my disappointment and extreme regret outside of the fact that we all recognize his large ability, his great devotion to the Irrigation Congress, and the work he has done in the past.

I will recall to your minds the fact that a year ago his daughter was killed suddenly in an auto accident. Governor Pardee and his wife have grieved over this great bereavement, and it was a great effort on his part when he finally decided once more to return to the work of the National Irrigation Congress, and wrote me a most tender letter upon that subject, stating that: "Wife and I have finally decided once again to be with you." Now comes a telegram this morning:

TELEGRAM FROM GOVERNOR PARDEE.

"Illness prevents my attendance. There should be no cessation in the good work, and our Congress is the best means to insure its continuance. Its present great influence is an asset which cannot be transferred to any successors. Kind regards to all of my good friends."

(Signed) "GEORGE C. PARDEE."

MR. H. L. MOODY, of Washington: I move you, sir, that a proper telegram be framed and sent by this Congress to Governor Pardee expressing to him our regrets at his inability to be present.

PRESIDENT FOWLER: Motion is made and seconded repeatedly that a proper telegram be sent by this Congress to Governor Pardee expressing the regrets of the Congress at his inability to be with us; a very kind and proper recognition.

The question was put, and the motion unanimously prevailed.

PRESIDENT FOWLER: The Chair will designate Dr. McGee to prepare a proper resolution to be sent to Governor Pardee.

The next paper of the afternoon was to have been on the "Constructive Work of the Reclamation Service," by Dr. F. H. Newell, Director of the United States Reclamation Service. I understand that Mr. Blanchard—is he here in the hall?—was to have a message from Mr. Newell to read to us. Is Mr. Blanchard here?

MR. C. J. BLANCHARD, of Washington, D. C.: I have not received the message yet. There has been some delay in the telegraph service.

PRESIDENT FOWLER: Mr. Blanchard has not received the message. It may come later in the afternoon.

We had on the program, although it is not printed here, a paper by Secretary Fisher of the Interior Department. I received, a day or two before I left for Chicago, a second letter from Mr. Fisher regarding the matter, I having seen Secretary Fisher a few weeks before, in which he says: "Although this is the first week of the National Congress in Washington, and although my work is piling upon me in a way to almost frighten me, yet I shall make every effort to be with you at the Congress." We have received word, however, within twenty-four hours that Mr. Fisher could not be with us at this Congress.

The subject of the next paper is the "Magnitude of Irrigation Interests," by R. P. Teele, in charge of Irrigation Statistics, Bureau of the Census. I have much pleasure in introducing Mr. Teele. (Applause.)

Address by

R. P. Teele

In Charge of Irrigation Statistics, Bureau of the Census

MAGNITUDE OF IRRIGATION INTERESTS

Mr. President, Ladies and Gentlemen: Before reading my paper I want to say that it is principally composed of figures, and it gives the results of the census of irrigation which has just been completed. We have had these figures printed much more in detail than they are given in the paper, and they will be here for distribution to those who are especially interested. I do not suppose there will be enough copies to give everyone a copy, so, if you have only a passing interest, please do not take them, but there should be enough for all who are particularly interested. These printed tables give the results for the whole United States and also by states.*

Last year I outlined to this Congress the plans for taking the census of irrigation, which were just then being put into operation. At that time I expressed the hope that the results would be ready to present to this Congress. That hope is only partly realized, as not all of the data collected has been tabulated and arranged.

It may be well to recall the language of the law under which this work is being done, in order that you may see the scope of the work undertaken and judge of the progress made.

An amendment to the Census law, approved February 25, 1910, contained the following clause:

"Inquiries shall also be made as to the location and character of irrigation enterprises, quantity of land irrigated in the arid region of the United States and in each state and county in that section under state and Federal laws; the price at which these lands, including water rights, are obtainable; the character and value of crops produced on irrigated lands, the amount of water used per acre for said irrigation and whether it was obtainable from national, state, or private works; the location of the various projects and methods of construction, with facts as to their physical condition; the amount of capital invested in such irrigation works."

To date the field work has been completed; the tabulation, except crops, is finished, advance press notices giving the results by states have been issued, and a United States summary has been prepared, to be released to-day. One preliminary state bulletin giving the results by counties with some summarizing and discussion has been issued, and others are being prepared and submitted for publication as rapidly as possible. This series should be complete by the end of January. These bulletins contain little but the figures, but they will be followed by more comprehensive reports, which, under the law, must be completed by June 30, 1912.

The preliminary state bulletins just mentioned are printed in somewhat limited numbers, but it is the intention to supply them to all applicants within the states to which they refer. The preliminary bulletin for the United States will be printed in large enough numbers to be distributed to all applicants.

It will be noted that the law calls for the classification of the returns by the State and Federal laws under which the lands are supplied with water, and again by "national, state, or private works." Consequently all data have been classified primarily by the type of enterprise under which the land is supplied with water. The classifi-

*The principal tables referred to by Mr. Teele are incorporated in the appendix of this volume.

cations used are, U. S. Reclamation Service, U. S. Indian Service, Carey Act Enterprises, irrigation districts, co-operative enterprises, commercial enterprises, and individual and partnership enterprises.

ACREAGE IRRIGATED

The fundamental inquiry in the present census of irrigation, as well as in the two which preceded it, relates to the acreage irrigated. In the table which follows the acreage irrigated in 1889, 1899, and 1909 are given by states, with the increases in the two decades.

TABLE I

STATES	ACREAGE IRRIGATED			INCREASE		
	1909	1899	1889	1899-1909		1889-1899
				Amount	Per cent	Per cent
Arid States.....	13,739,499	7,527,690	3,631,381	6,211,809	82.5	107.3
Arizona.....	320,051	185,396	65,821	134,655	72.6	181.7
California.....	2,664,104	1,445,872	1,004,233	1,218,232	84.3	44.0
Colorado.....	2,792,032	1,611,271	890,735	1,180,761	73.3	80.9
Idaho.....	1,430,848	602,568	217,005	828,280	137.5	177.7
Kansas.....	37,479	23,620	20,818	13,859	58.7	13.5
Montana.....	1,679,084	951,154	350,582	727,930	76.5	171.3
Nebraska.....	255,950	148,538	11,744	107,412	72.3	1164.8
Nevada.....	701,833	504,168	224,403	197,665	39.2	124.7
New Mexico.....	461,718	203,893	91,745	257,825	126.5	122.2
North Dakota.....	10,248	4,872	445	5,376	110.3	994.8
Oklahoma.....	5,402	2,759	.....	2,643	95.8	.....
Oregon.....	686,129	388,310	177,944	297,819	76.7	118.2
South Dakota.....	63,248	43,676	15,717	19,572	44.8	177.9
Texas (exclusive of rice)....	1,428,283	40,952	18,241	123,331	301.2	124.5
Utah.....	999,410	629,293	263,473	370,117	58.8	138.8
Washington.....	334,378	135,470	48,799	198,908	146.8	177.6
Wyoming.....	1,133,302	605,878	229,676	527,424	87.1	163.8

The total acreage irrigated in the arid and semi-arid region, excluding rice, in 1889 was 3,631,381 acres; in 1899, 7,527,690 acres, and in 1909, 13,739,499 acres. The increase from 1889 to 1899 was 3,896,309 acres, or 107.3 per cent, and the increase from 1899 to 1909 was 6,211,809 acres, or 82.5 per cent. While the percentage of increase in the last decade was the smaller, the absolute increase was slightly more than double that in the former period.

In 1889 California stood first with 1,004,233 acres, Colorado second with 890,735 acres, and Montana third with 350,582 acres. In 1899 Colorado had taken first rank with 1,611,271 acres, California was second with 1,445,872 acres, and Montana was still third with 951,154 acres. In 1909 the same three states occupied the highest places with Colorado still first, California second, and Montana third, with Idaho a close fourth.

In the first decade Colorado showed the greatest absolute increase, —720,536 acres, Montana the next largest, with 600,572 acres, and California the third largest increase, 441,639 acres. During the same period Nebraska showed the largest percentage of increase—1164.8 per cent; North Dakota the next largest—994.8 per cent. Neither of these states is wholly arid and they had only small areas irrigated. Of the strictly arid states, Arizona showed the largest percentage of gain—181.7 per cent, and Idaho was next with a gain of 177.7 per cent.

Between 1899 and 1909 California showed the largest absolute

increase—1,218,232 acres; Colorado the next largest—1,180,761 acres, and Idaho the next—828,280 acres. Montana followed very closely with 727,930 acres. Texas shows the largest percentage of increase during this period—301.2 per cent, but the acreage is small. Washington is second in percentage of increase with 146.8 per cent; and Idaho is third with 137.5 per cent.

In addition to the acreage irrigated in 1909, the schedules called for the acreage which existing enterprises were capable of supplying with water in 1910, and the total acreage which these enterprises included. These acreages with those presented in the table previously read have been classified by the type of enterprise supplying water for their irrigation, and the results are presented by states in the printed tables which are here for distribution. These figures are summarized as follows:

Per cent of total acreage irrigated and included in projects represented by the different types of enterprise:

TABLE II

TYPES OF ENTERPRISE	ACREAGE IRRIGATED IN 1909		ACREAGE ENTERPRISES WERE CAPABLE OF IRRIGATING IN 1910		ACREAGE INCLUDED IN PROJECTS	
	Amount	Per cent of total	Amount	Per cent of total	Amount	Per cent of total
Arid States.....	13,739,499	100.0	19,335,711	100.0	31,112,110	100.0
U. S. Reclamation Service...	395,646	2.9	786,190	4.1	1,973,016	6.3
U. S. Indian Service.....	172,912	1.2	376,576	1.9	879,068	2.8
Carey Act Enterprises.....	288,553	2.1	1,089,677	5.7	2,573,874	8.3
Irrigation Districts.....	533,142	3.9	804,951	4.2	1,589,865	5.1
Co-operative Enterprises...	4,646,039	33.8	6,194,677	32.0	8,845,437	28.5
Commercial Enterprises....	1,444,806	10.6	2,416,516	12.5	5,096,337	16.3
Individual and Partnership Enterprises...	6,258,401	45.5	7,667,124	39.6	10,154,513	32.7

In this table the acreage included in the irrigation districts in Ada and Canyon counties, Idaho, for which water is now diverted by the Reclamation Service, has been credited to the irrigation districts. In the same way the acreage served by the old community ditches in New Mexico, for which water is now diverted by the Reclamation Service, is credited to co-operative enterprises. On the other hand, the lands irrigated by old works taken over by the Reclamation Service and now actually operated by that service, as in the Salt River Valley in Arizona, the Truckee Valley in Nevada, and the Yakima Valley in Washington, have been credited to the Reclamation Service.

The most striking fact brought out by this table is the very large percentage of the acreage irrigated by co-operative, individual, and partnership enterprises. Of the acreage irrigated in 1909 about 84 per cent was included in enterprises of this character, placing irrigation districts in this class. Of the remaining 16 per cent, about 10 per cent is included in what have been classified as commercial enterprises—those supplying water to parties who have no interest in works. The remaining six per cent is divided as follows: Reclamation Service 3 per cent, Carey Act enterprises 2 per cent, and Indian Service 1 per cent. As there are large enterprises in course of development these figures for 1909 do not fully represent the present situation. The figures for 1910 give the Reclamation Service about 4 per cent of the total, the Carey Act about 6 per cent of the total, and the Indian Service about 2 per cent, the decrease being principally in individual and partnership enterprises. Of the acreage included in projects, the Reclamation Service shows about 6 per cent, the Carey Act about 8 per

cent, and the Indian Service about 3 per cent, the decrease being divided between co-operative and individual and partnership enterprises.

All Reclamation and Carey Act enterprises and many of the commercial enterprises are eventually to become co-operative. Classing these with those already under the control of the water users, leaves less than 10 per cent of the acreage irrigated in 1909 to be served by works which are not now or soon to be controlled by those who use the water. While statistics to prove the statement are not available, I believe it safe to say that in no other industry in this country is there so large a percentage of co-operation.

ACREAGE AVAILABLE FOR EXPANSION

The object of the inquiries as to the acreage which enterprises were capable of supplying with water in 1910, and the acreage included in projects was to get some approximation of the acreage available for the extension of the irrigated acreage. A table has been prepared and printed showing these acreages by states. This is too long to read in full, but it shows that existing enterprises reported themselves ready to supply water to 19,335,711 acres in 1910, an excess over the acreage irrigated in 1909 of 5,596,212 acres. The larger part of this additional acreage is in five states: Colorado reports slightly over one million acres; Idaho and California each report a little less than one million acres, while Montana and Wyoming each report slightly more than a half-million. Of the other states Utah alone, with about 250,000 acres, has as much as 200,000 acres. The acreage reported as included in projects is 31,112,110, an excess of 17,372,611 over the acreage irrigated in 1909. This additional acreage is distributed among the states in about the same proportions as the additional acreage reported in 1910, except that Oregon reports nearly 2,000,000 acres. It should be noted that this land is not reported as available for settlement, but merely as under ditch in 1910 and not irrigated in 1909 or included in projects. Much of this land under ditch but not yet irrigated is undoubtedly in farms which are already taken up but only partially irrigated; while much of that included in projects is not yet ready for settlement.

The schedules used for all but individual and partnership enterprises contained an inquiry as to the acreage available for settlement. One of the printed tables shows the acreages reported as available, classified by type of enterprise and by states. The total acreage given is 5,766,421 acres, distributed by states as follows:

ACREAGE AVAILABLE FOR SETTLEMENT JULY 1, 1910

States	Total
The Arid Region	5,766,421
Arizona	471,811
California	893,917
Colorado	1,301,843
Idaho (1)	444,169
Kansas	3,724
Montana	435,124
Nebraska	106,616
Nevada	16,810
New Mexico	231,076
North Dakota	11,894
Oklahoma	None
Oregon	387,782
South Dakota	54,376
Texas	328,623
Utah (2)	531,904
Washington	250,227
Wyoming (3)	296,525

- (1) U. S. Indian Service 30,000. (2) U. S. Indian Service 91,900.
 (3) U. S. Indian Service 8,127.

This same acreage is distributed by type of enterprise as follows:

ACREAGE REPORTED AVAILABLE FOR SETTLEMENT JULY 1,

	1910	Acres.
Reclamation Service.....		679,224
Carey Act enterprises.....		754,318
Irrigation districts.....		626,317
Co-operative enterprises		1,729,727
Commercial enterprises.....		1,846,808
Indian		130,027

On many schedules this inquiry was not answered, and it is possible that the owners of some enterprises over-stated. It seems probable, however, that these two errors, if there are such, about compensate, so that the acreage given represents very well the acreage available for settlement in the summer of 1910.

ACREAGE IRRIGATED BY SOURCE OF WATER SUPPLY

The acreage irrigated is classified by source of water supply, as follows:

Streams	12,940,849
Gravity	12,783,121
Pumped	157,728
Wells	433,633
Flowing	125,590
Pumped	308,043
Reservoirs	98,193
Lakes	70,638
Gravity	58,121
Pumped	12,517
Springs	196,186
Total acreage irrigated with pumped water	478,288

The larger part of the acreage watered from flowing wells is in California and New Mexico; most of the pumped wells are in California. California has about 65 per cent of the total acreage irrigated with pumped water, and Texas has nearly 14 per cent.

IRRIGATION WORKS

The extent and character of the irrigation works in the arid region are shown by states in the printed tables. The statistics relating to them are summarized as follows:

Number of independent enterprises.....	54,669
Length of ditches (miles).....	125,615
Main ditches.....	87,336
Laterals	38,279
Number of reservoirs.....	6,933
Capacity of reservoirs (acre-feet).....	12,872,256
Number of flowing wells used for irrigation.....	5,070
Number of pumped wells used for irrigation.....	14,544
Number of pumping plants.....	13,951
Engine capacity of pumping plants (horsepower)...	207,241
Capacity of pumps (Gal. per min.).....	9,918,755

COST

The cost of irrigation enterprises is given as of the date July 1, 1910. It includes cost of acquiring rights as well as construction, but in most cases the cost of acquiring rights is limited to filing fees, and is almost negligible. The cost reported is as follows:

Cost in 1889	\$29,611,000
Cost in 1899	67,482,261
Cost in 1910	304,699,450
Per cent of increase 1889-1899	127.9
Increase 1899-1910—	
Amount	237,217,189
Per cent	351.5

The cost of irrigation enterprises has increased from 1899 to 1910, 351.5 per cent, while the acreage irrigated increased but 82.5 per cent, showing a very great increase in the average cost per acre. The average cost per acre in the three census periods is as follows:

AVERAGE COST PER ACRE

1889	\$ 8.15
1899	8.89
Based on 1909 acreage	22.18
1910—	
Based on 1910 acreage	15.76

While the average cost per acre in 1899 was approximately the same as in 1889, in 1910 the average computed in the same way—on the basis of the acreage actually irrigated in the census year—has risen to \$22.18 per acre, an increase of about 150 per cent. On account of the number of incomplete enterprises on which large expenditures have been made while but little land is irrigated, this average does not fairly represent the cost of water per acre. An average based on the acreage to which all enterprises were capable of supplying water in 1910—\$15.76 per acre—more nearly represents the actual cost although this is still too high, since a part of the expenditures already made provide for land which cannot yet be supplied with water. This average is nearly twice the average cost in 1899.

However, neither of the averages just given is a measure of the cost of the newer enterprises, since these averages are based on total acreage and total cost. The cost of the newer enterprises should properly be based on the increases in acreage and in cost since 1899. On this basis the average cost per acre for works built since 1899 is \$38.19 per acre, as against \$8.89 per acre for those built prior to that date. In other words, the cost of these new works is nearly four and one-half times as great as that of the older ones.

COST OF OPERATION AND MAINTENANCE

The cost of operation and maintenance is reported for about six and one-half million acres of the thirteen and one-half acres irrigated in 1909. None of this is in individual and partnership enterprises and it represents 85.6 per cent of the acreage under other than individual and partnership enterprises. It can be said, therefore, to represent very well the average annual cost of water. The cost reported for the three census years is as follows:

AVERAGE ANNUAL COST OF OPERATION AND MAINTENANCE

1889	\$ 1.07
1899 .....	.38
1909	1.07

The reports of 1889 and 1899 are not sufficiently full to make it possible to judge whether the averages for those years are comparable with the average for 1909, but the fact that this cost in 1899 is far below that in either 1889 or 1909 leads to the supposition that they are not made on the same basis. It is a peculiar coincidence that the averages for 1889 and 1909 are precisely equal.

WATER RIGHTS

In this census, for the first time, inquiries were made as to the character of water rights possessed by the owners of irrigation enterprises. Rights were divided into six classes—Riparian rights, appropriation and use, notice filed and posted, adjudicated, permit from state, and certificate or license from the state. Clerks were instructed to place schedules which showed more than one of these classes in the most advanced class. For instance, if a schedule from Colorado was

marked "notice filed and posted and adjudicated" it was classed as adjudicated, or if a schedule from Wyoming was marked "adjudicated and certificate" it was placed under certificate from state. Clerks were further instructed to place all schedules on which this inquiry was unanswered under "appropriation and use," on the theory that if anyone had evidence of title he would know what it was and tell it. It is possible, therefore, that the acreage reported under "appropriation and use" is too large. The distribution of the acreage irrigated in 1909, by type of water rights, is as follows:

**PER CENT DISTRIBUTION OF ACREAGE IRRIGATED IN 1909,
BY TYPE OF WATER RIGHTS**

	Per cent
Riparian rights	2.1
Appropriation and use.....	34.0
Notice filed and posted.....	16.2
Adjudicated	35.2
Permit from state.....	6.7
Certificate or license from state	5.7

In general terms, the rights of the first three classes are undefined, and those of the last three classes are defined. The total acreage is divided almost equally between these two groups. The states having a large percentage of defined rights are Colorado with about 86 per cent defined; Idaho with about 55 per cent; Nebraska with about 81 per cent; and Wyoming with about 91 per cent.

As previously stated, crops are not yet tabulated.

CONCLUSION

Last year I stated that in my opinion it was not the function of the Census Bureau to recommend changes in courses of action, but rather to supply this Congress, the United States Congress, and the states the information which would enable those bodies to act intelligently on the subject of irrigation. I do wish, however, to call attention to some of the conditions which are brought out by the census returns. These returns furnish a numerical statement of a condition of which all familiar with the West were already cognizant—that there is a very large unirrigated acreage for which works are built and water is available, and that the water supply for this land has been provided at a much higher cost than had previously been considered practicable. Such a condition means either that the land actually irrigated must bear the expense for the idle land, when its own proportion of the whole expense is already high, or that the investor in irrigation works must wait indefinitely for returns on his money. His own legitimate burden is all the new settler can possibly bear, and consequently the investor must carry the load—or drop it.

There is little doubt that most of our irrigation enterprises are practicable and would succeed to the satisfaction of all concerned if all of the land for which water is provided were producing returns, but one-third or one-half, or three-fourths of the land cannot carry the whole load. Now the conclusion from this is obvious—what the West needs just now is not more irrigation works but more irrigating. This Congress has done a great work in promoting the construction of irrigation works, but I believe that its great present opportunity for continued usefulness lies in making good the investments which it has so vigorously encouraged in the past. In other words, it should devote itself to the settlement and cultivation of the land already provided with water or for which water is now being made available. If this is successfully accomplished no irrigation congress or other agency will be necessary to encourage new investments. (Applause.)

PRESIDENT FOWLER: There are two things I should like to

say to the delegates. First, this Congress is responsible for the Irrigation Census. In other words, this Congress is the father of the Census of Irrigation, and the Census of Irrigation is the child of this Congress.

Now, the paper may seem a little dry, but it is intensely interesting to those who are intimately associated with irrigation, and it is a very valuable paper.

I want to say to anyone who is inclined, for lack of time or any other reason, to withdraw—as I have seen a dozen within a few minutes—I want to say that we are preparing to make a change in the program so that Mr. Arthur P. Davis, Chief Engineer of the United States Reclamation Service, who, as many of you know, went to Turkestan last spring and returned in the summer with valuable information concerning western Asia irrigation, is here with his slides and we are making preparations to have him present those beautiful slides and that most interesting talk. No one is better suited to present this subject than Mr. Davis, and we will hear him the latter part of the afternoon.

We are to have another paper by Senator Whiteside, of Montana, so that you have quite a little feast here this afternoon, and you will miss a great deal if you leave, unless you are absolutely compelled to do so.

MR. GEO. E. BARSTOW, of Texas: Mr. Chairman, I would like at this time to offer two resolutions for the consideration of the Congress. These resolutions are short, and I would like to read them to get the subject before the Congress. They have reference purely to the matter of public welfare; and I would like then to refer them to the Committee on Resolutions.

PRESIDENT FOWLER: Just a moment—the rules adopted by the Congress read as follows:

General resolutions, after reading by the Secretary, shall be referred to the Committee on Resolutions without debate, and no general resolution shall be received later than Wednesday, without unanimous consent. Special resolutions relating to the conduct of the Congress may be read and considered at the discretion of the presiding officer after examination by him.

MR. BARSTOW: If it meets the approval of the Congress I would like to have that rule suspended. These resolutions have purely to do with the public welfare.

PRESIDENT FOWLER: I think it would probably be as well to follow the rule and have the resolutions read by the secretary.

MR. BARSTOW: I have no objection to that. I will offer these resolutions and ask that they be read.

PRESIDENT FOWLER: The Secretary will read the resolutions.

Thereupon the Secretary read the resolutions, one referring to unworthy irrigation enterprises and calling for the enactment of laws dealing therewith, the other resolution calling attention to the importance of drainage and the need of laws for its encouragement.

PRESIDENT FOWLER: The resolutions will be referred, under the rules, to the Committee on Resolutions.

The next paper on the program is "Government Irrigation in Montana," by Hon. Fred Whiteside, State Senator from Montana.

Address by
Fred Whiteside
State Senator from Montana

GOVERNMENT IRRIGATION IN MONTANA

I desire first of all to say that the people of Montana are in full sympathy with the work of national irrigation. We recognize the fact that it is a subject which reaches far beyond the confines of any state or section, and we wish to see it handled in a manner that will inure to the best interests of the whole country. While we must view the subject from the narrow window of our local interests, we hope we are big enough and broad enough to act in the interest of the entire country rather than from any selfish motive.

We have our difficulties and our grievances in connection with the reclamation work, but we are not here to ask you to recognize those grievances except in so far as they are common to the reclamation work as a whole. I do not believe that grievances should be brought here for adjustment, but I do believe that conditions should be stated here as they exist upon the various projects in order that you may secure comprehensive knowledge as the foundation for any action you may take. Our difficulties may be divided into two classes: those which are due to acts of administration and those which come from defects in the reclamation law itself. There was a time when the friends of national irrigation hesitated to ask for either legislative or administrative reforms, lest the entire law should be repealed, but that time I believe has passed, for national irrigation is so firmly entrenched in public favor that it is not going to be dislodged.

There is one problem that will always be with us, namely, the production of food cost of living, and that cost will always be fixed by the number of people who live upon the farm as compared to the number who live in the city. The people now recognize the fact that national irrigation will decrease the cost of living by increasing the number of people on the farms and by increasing the yield per acre.

Therefore, I believe we are safe in asking for those reasonable reforms both in the form and the administration of the law as will inure to the best interest of the people who live under the irrigation projects.

Not by way of criticism, but as a significant circumstance, I wish to call your attention to the fact that in almost every instance the actual cost of construction and supervision of government irrigation projects has largely exceeded the first estimate of cost on which the settlers were induced to put in their lands. Often the actual cost has been two or three times the estimated cost, and is it not a strange co-incident that every engineer made his mistake upon the same side of the book? For I have never heard of a project where the actual cost has been lower than the estimates, taking the project as a whole.

Did it ever occur to you that perhaps mistakes in estimates were less responsible for these discrepancies than extravagant methods of construction and administration? In connection with this thought there is just one point to which I wish to call your attention. The settler who goes into a project upon an estimated cost of \$25.00 per acre, expecting to pay \$2.50 per acre per year for ten years, finds a different problem confronting him when the actual cost has mounted to \$60.00 an acre, and he must pay \$6.00 per acre per year. Whether the difference be due to faulty estimates or extravagant methods, the responsibility lies with the government, and would it be unreasonable to ask that the settlers' payments be extended over a greater period

of time? We believe that such a request is not unreasonable. It goes without saying that many difficulties are encountered by the Reclamation Service, and due regard for the law makes the work slower than it would otherwise be. The settlers have come to believe that fat salaries and comfortable berths are not conducive to haste where the salary terminates with the completion of the work.

In the interest of humanity in general and the settlers in particular, there ought to be some method of limiting the time over which the work can be extended.

In August, 1902, nearly ten years ago, the Milk River project was established covering 240,000 acres in northern Montana. This year for the first time a tract of 2,000 acres was irrigated, leaving 238,000 acres still to be covered. One-fourth of the estimated cost has been expended, one-twelfth of the work has been done, and less than one per cent of the land is actually under irrigation. On this basis the ultimate cost will be \$75.00 per acre, as against an estimated cost of \$25.00, and at the rate of progress established the work will be finished about the close of the present century.

Not all of the delay can be charged to the Reclamation Service, however. For one thing, there was a dispute with Canada over the ownership of the water, and prior water rights claimed by individuals were also a factor of delay, but delays from such sources were more apparent than real, for regardless of these disputes the government began the construction of a flood-water system in 1908 for temporary use which was to be a part of the main system when the latter should be completed, the settlers agreeing to take the chance of getting water.

Nearly a million dollars all told has been expended on the project, and practically all the work was done while the dispute with Canada was pending and before the prior water claims were settled, so these matters could not have been serious factors of delay.

The settlers have signed every agreement presented by the government and have done everything in their power to forward the work.

The actual cost is more than double the estimated cost, but if this large sum expended represented money economically disbursed, we could bear with fortitude the high cost of the work, but it doesn't represent anything of the kind. More than 40 per cent of the money has gone for so-called administrative purpose. Not a shovelful of earth has been moved on the project for two and one-half years, and yet a big force of engineers and office men have been maintained all the time. In fact, this force of ten to fifty men has been maintained every moment for the last nine years. They play lawn tennis and baseball in the summer time, and at this very moment they are engaged in the arduous duty of keeping the office stoves warm with coal that is bought by the government and charged up to the settlers.

What do you think of a project where the cost of engineering and administration equaled or nearly equaled the cost of actual construction? If this enormous cost insured perfect work, with the elimination of all mistakes, we could stand it with better grace, but it doesn't do anything of the kind. Of the money expended on this project, \$265,000 was spent at St. Mary's Lake, and we are now told that this work is to be abandoned and a new line is to be built. This is said just as flippantly as if it only involved the price of a two-cent stamp, and it perhaps means no more than that to the men who have squandered the money. But how about the settler whose home is mortgaged to pay the debt? How many weary steps must he take behind his plow to earn that \$265,000? How many housewives must scrimp and scrape and save to pay that debt? How many little ones will go to school across the bleak prairies with toes peeping from shoes because their parents are struggling to pay that debt?

In 1908 when the project was short of funds, the settlers agreed to work on the canal, accepting scrip in payment, which scrip they

could return to the government in payment for water. Then the government declared the scrip illegal, and the work was stopped before the settlers had any water. The settlers, to get bread for their families, had to sell the scrip to money sharks at about sixty cents on the dollar, and the government afterward redeemed the scrip at par, charging it up against the settlers' lands. When the work was stopped, about 2,000 acres on the south side of Milk River had been actually put under water.

The sun never shone upon soil more fertile than is contained in the Milk River Valley. On the small area watered this year for the first time the yield was 20 bushels of flax, 50 bushels of wheat, and 80 bushels of oats per acre. Just across the river, where the settlers are hanging on by their eyelashes trying to raise enough to live on until they can get water and where the soil is equally fertile, one man threshed 13 bushels of flax from 80 acres, and many of the fields were not worth cutting. In July and August the settler could stand in his field of withering grain and see the water pouring over the Dodson dam in ample volume to cover all the land, running to waste down Milk River, just as it has for three years since the dam was constructed. On the north side of the river, just below the dam, there is a body of land containing many thousands acres that could be irrigated at nominal cost in addition to the money already expended, but nothing is being done, and the water is pouring over the dam all the time. On October 1st I was there and saw water three feet in depth going over the dam and running to waste down the river.

There was a time, perhaps, when no funds were available for work on the project, but in 1910 four million dollars was set aside for this work, but not a shovelful of earth has been moved since then. The full force of office and field men has been maintained, however, all the time. With four million dollars on hand available for this work, Mr. Newell on July 18th last wrote to one of the settlers asking if the settlers would be willing to do any work on the north side canal at their own expense. The man who received that letter circulated a paper asking each settler to sign for the amount of work he was willing to do. Some of the settlers saw the injustice of the proposition, and one of them wrote a letter to Mr. Newell as follows:

"Kalispell, Montana, August 8, 1911.

"F. H. Newell,
Washington, D. C.

"Dear Sir:

"Being an owner of land under the Dodson North Canal I have been asked to sign an agreement to do a portion of the work on the Canal in order that we may be able to use some of the water that has been running to waste ever since the dam was completed, nearly three years ago. This request comes from the land owners and is inspired by your letter of July 18, 1911, to Mr. J. W. Carlson, of Dodson, Montana, in which letter you inquire if the settlers will be willing to do any of the work on the Canal.

"After nearly ten years of waiting I am willing to do almost anything to get water on my land, but I wish to ask you why you want the settlers to advance the money to build this Canal when ample funds have been appropriated by the government for this work?

"Now that the dam is in use the additional cost of putting water on this land will be comparatively light and, in view of the fact that you have expended large sums to put water on the south side that is many miles from the dam and much more expensive to cover, I wish to ask why we who live close to the dam on the north side should be expected to pay in advance the cost of putting water on our land?

"As this land can be irrigated more cheaply than any other portion

of the project would it not be good business policy to finish this portion first in order that the revenue may help in completing the more difficult part of the work?

"I know that the water rights above have been used as the excuse for much of the delay on the Dodson North Canal, but why should this cause delay when there is an ample supply of water running to waste all the time over the Dodson dam?

"Since about \$8,000,000 has already been expended on this project, forty per cent of which has gone for administrative purposes, would it not be well for the government to put in the comparatively small sum necessary to put water on our land, even if the water rights above should cause an additional shortage of water?

"We land owners are the ones who will suffer from anything of the kind, and why should you ask us to advance the money required to complete the work when you have government money on hand available for that purpose?

"I trust you will pardon any seeming impertinence in this letter, for it is not intended as such, but as a frank request for an explanation of the matters pertaining to the Dodson North Canal, and this explanation I believe you can give, if you see fit to do so.

"Thanking you for an early reply, I am,

"Yours truly,

HAMILTON LEE."

In answer to that letter Mr. Newell wrote in substance that the government was unwilling to do the work because of the large amount involved with no assurance that the water rights would be settled for years to come. As a matter of fact, about a year ago the settlers signed an agreement with the department which was supposed to settle all of the water rights in a manner satisfactory to the department, and it was promised that work would start at once, but after seven months of waiting the settlers were told that another and different contract would have to be signed and that contract is now being signed. The settlers have complied with every request made by the reclamation officials, but they have signed so many different contracts, only to have them repudiated by the Reclamation Service, that it is now difficult to get them to sign anything. They say that Mr. Newell can't draw a contract that is satisfactory to himself over night. Many of the settlers have signed away valuable water rights purely out of public spirit and practically all the owners of patented lands have put their lands into the project.

Just put yourself in the position of the settler who has pledged his land to pay the cost of this irrigation work. He went out there and braved the hardships of the frontier in order to build for himself a home. Through winter cold and summer heat he toiled on, always toward the same goal. The little plot of land that he owns represents a lifetime of hardships and toil, and now through no fault of his he sees a mortgage being piled up against his land that he can never hope to pay. For nine years he has seen a horde of government employees doing nothing but drawing fat salaries and literally eating up his home. If he asks for any information about expenditures or anything else concerning the subject, he is told, in effect, that it is none of his business. Government employees are not allowed to give out information.

There are two classes of settlers who are interested in the projects. One is the man who had title to his land, and who now sees his home being confiscated by the government. The other is the settler who has improved a piece of government land to which he hopes some day to get title, and it is hard to say which is in the worst situation. One is in a hopeless struggle to gain a home, and the other as powerless to prevent the confiscation of the home that he has already earned.

The settlers who own patented land, as a rule, have some livestock, and they are not in immediate want, but the homestead settlers, who have gone there in recent years upon the promise of free homes, are almost without exception in a desperate situation. They must work for wages in order to live at all, and often the settler must go a long ways from home in order to find work. If his family leaves the claim even for a day, it is cause sufficient to bring a force of government detectives out from Washington.

My own home is 350 miles west of this project on the same line of railroad. About two months ago I received a letter from one of the settlers asking for employment for himself and a neighbor who he said had five children. I wrote them to come over, and in about ten days they showed up. They had ridden part way on freight trains and had walked when they couldn't ride. I learned that the man with five children, before coming over, on the strength of having a job promised, had secured credit with a local merchant for fifty pounds of flour which he had carried on his back out to his family, a distance of eighteen miles. There are hundreds of families under that project in the same desperate situation, and God only knows how they are to get through the winter.

It is all very well for us to keep this Congress upon a high plane, where it will be above the petty grievances of the settlers. The gentlemen who hold comfortable berths with the government may wash their hands of responsibility, but there are hungry women and children out there, and we who live in that region must face this problem whether we will or no. When the settlers agreed to accept scrip for work on the project they were promised certain other work for which cash was to be paid, but, instead of giving such work to the settlers, they sent to other states and bought a lot of fine teams, and the work done with them cost three times as much as the settlers would have been glad to accept for the same service. The government teams were bought and are being fed at the expense of the settlers.

Stone for the Dodson dam was quarried and hauled several miles by contract at so much per cord. The contractors were required to cord the stone up a short distance from the dam. The stone was measured and then re-loaded on government teams and hauled to the dam. The cost of this re-hauling was about equal to the cost of quarrying and hauling the stone several miles by contract. The contractors offered to put the stone in the dam at a slight additional cost, having the stone measured on the wagon, that saving the cost of re-hauling, but this offer was refused. Sand was hauled about seven miles to the Dodson dam by the settlers at \$2.75 per yard. The engineer in charge said the settlers were making too much money, so the work was done by government teams at a cost of about \$6.00 per yard.

I have been informed by reliable and experienced men who have been over the St. Mary's end of the project that the work, which was done there at a cost of \$265,000, could be done by contract for less than \$100,000. This is the part of the work that they now propose to abandon and do over again in another place.

A residence for the engineer in charge was constructed for this part of the project at Browning, 40 miles away, at a cost of about \$4,000. The residence has never been used, but a caretaker has been employed for several years at \$75.00 per month to look after it. Another caretaker is also employed to look after a few tar-paper shacks at the Dodson dam. When the Dodson dam was built the project engineer maintained his office with a large force of clerks at Malta. Another engineer and office force was employed at the dam. They had first and second engineers, foreman and assistant foremen, storekeeper and assistant storekeeper, timekeeper and assistant timekeeper, bookkeeper and assistant bookkeeper, and so on down the line, although the dam was to cost less than \$100,000. At one time they

had ten men at work on the dam with twenty-eight officers, engineers, and foremen over them. Do you wonder that the cost of government irrigation usually doubles the first estimate?

On the Lower Yellowstone project the first estimate on which the settlers were induced to put their lands was \$30.00 per acre. The actual cost is now close to \$60.00 per acre, and the end not yet in sight.

Last summer I went down on the Flathead project where they have been working three years on a tunnel to be used in generating power for pumping water. I found eight men actually employed in the tunnel and seventeen men employed as engineers, bookkeepers, storekeepers, timekeepers, etc. When the tunnel is completed the work of building the power plant will only have been started. They are going to lift the water about 200 feet, and the power generated will probably be sufficient to wet the bottom of the reservoir with a year of pumping.

When the Reclamation Act was first passed we had visions of fine farms and school houses and good roads and automobiles, but government red tape, incompetency, and extravagance is not only taking the automobiles of our dreams, but it is taking the settlers's home and his horse and even his dog.

In presenting these facts, for they are facts, I have no desire to work injury to any person or to criticize any individual, for we blame the system rather than the individual. Our hope is that you will help us to secure legislation that will make such conditions impossible on any project.

We want a law requiring that each Water Users' Association be furnished with an itemized list of expenditures on the project, either monthly or quarterly. Publicity, we believe, will correct most of the evils of administration. We want a law limiting the amount that a settler may be required to pay on construction cost to \$2.50 per acre each year. If the cost of the project is \$25.00 per acre, it would be paid in ten years; if the cost is higher, we want the payments extended over a greater period of time.

Montana is a state of wonderful resources and great possibilities, and government irrigation is destined to play an important part in the future of our commonwealth. (Applause.)

PRESIDENT FOWLER: The Congress will now take a recess in order to give an opportunity for preparing the screen for Mr. Davis' lecture upon irrigation in Western Asia, which will follow immediately after recess.

A short recess was here taken, after which the proceedings were continued as follows:

PRESIDENT FOWLER: Ladies and Gentlemen, we will now vary our program somewhat by having the lecture by Mr. Arthur P. Davis, Chief Engineer United States Reclamation Service, on the subject, "Irrigation in Western Asia."

Address by

Arthur P. Davis

Chief Engineer U. S. Reclamation Service

IRRIGATION IN WESTERN ASIA

Illustrated by Stereopticon Views

Mr. President, Ladies and Gentlemen: Western Turkestan is a portion of the Russian Empire, and comprises the southwestern part of Asiatic Russia. Within its limits are the provinces of Sir Daria,

Ferghana, Samarkand and Trans-Caspia. These are Russian provinces entirely under the jurisdiction of the Empire. They have a total area of 1,680,000 square miles, and a population of about 9,000,000. The same general area also includes the provinces of Khiva and Bokhara, which are nominally independent principalities, but are under the protection of Russia.

Nearly all of the drainage of Turkestan is into the Aral Sea, a body of water about 200 miles long and 150 miles wide. It is only about 60 feet above sea level. The eastern and southern portions of Turkestan are traversed by lofty mountain ranges, upon which the precipitation is very great, and is mostly in the form of snow. These mountains are drained by numerous streams, most of which lose their waters in the great sandy deserts of Central Turkestan, but the largest two of which reach the Aral Sea.

Most of the streams are used more or less for irrigation, the total irrigated area in Turkestan being nearly 6,000,000 acres, of which over one-third or 2,000,000 acres is in Ferghana Province, and 3,000,000 are irrigated in Samarkand and Sir Daria Provinces, and the rest scattered through the other provinces.

Russian Turkestan is a region of very great historic interest. It abounds in ruins of buildings, forts and irrigation systems, some of them prehistoric. The celebrated expedition of Alexander the Great penetrated Turkestan as far as Khoghent, and ruins of fortresses built by his men may still be seen.

At a later date, the country was conquered by the renowned Genghis Kahn, whose descendants reigned over Turkestan for several centuries. One of them, Tamerlane, made his capital at the city of Samarkand, and built there magnificent palaces and temples of substantial character and great architectural beauty, richly decorated with mosaic. The usual native architecture is of adobe, like that of New Mexico.

Turkestan was conquered and reconquered so many times and so many efforts to colonize it have been made, that its population is a complicated mixture of Europeans, Mongols, Persian, Turkomen and various other peoples. Agricultural and pastoral pursuits are their chief occupations, and their state of civilization is similar to that of Mexico and Central America. Plowing is done with a forked stick shod with iron, drawn by oxen or horses. Camels are extensively used as beasts of burden, and the donkey is also much in evidence.

The climate is of the most pronounced continental type, very cold in winter and hot in summer. The precipitation in the valley regions is from 5 to 10 inches per annum, but in the lofty mountains is very great, and is mostly in the form of snow.

The largest river in Turkestan is the Amou Daria or Oxus, which rises in the high mountains of the Hindu-Kush and Kuen Lun. It is nearly 2,000 miles in length, 800 miles of which are the valley portions of the main stream from the junction of the Panj and Vach, its principal tributaries, to the Aral Sea. Innumerable small diversions for irrigation are made from this stream and its tributaries in the rude way characteristic of primitive peoples. There is still a very large unappropriated flow of water, but the small declivity of the river and the undesirable character of the land outside of its immediate valley have so far not attracted the investment of capital.

The valley of the Amou Daria for a width of over 60 miles is occupied mainly by sand dunes almost bare of vegetation and constantly shifting under the action of the wind which prevails from April to September, inclusive. In the winter months it blows more from other directions. It is said that twelve years ago trains passing through this region averaged less than two miles per hour on account of sand obstruction, and had to carry a crew of laborers to shovel sand off the track. During the last twelve years efforts have been made

to cover a zone along the track with vegetation to break the force of the wind and hold the sand in place. An Experiment Station was established at Farob and in 1898 the propagation of native plants was begun. Seeds of the native desert shrubbery were planted in a nursery, where the sand was covered with brush and staked down to keep it from blowing away. The young shrubs were transplanted from the nursery to a zone one thousand feet wide on the west side of the railroad track and five hundred feet on the east side. About 15 to 20 per cent of the plants grew and spread by natural seeding. The vegetated area is now more than one thousand feet wide on each side of the track for a part of the distance, and great benefit has resulted. The work is still in progress.

The plant most successful for first use is *Alhalla Kamolorum*, which grows most easily and abundantly. After a good stand of this is obtained, *Salsola* is introduced, which grows first as a parasite on others and finally crowds them out, growing larger and being thus more effective.

The most important and best constructed irrigation system in Turkestan is on the Estate of the Czar, on the Murgab River, with headquarters at the historic town of Byram Ali.

The first recorded irrigation construction in the Murgab Valley was under the authority of the Sultan Sanjar in the Twelfth Century, who built a dam about 60 miles above Byram Ali and irrigated over 50,000 acres. The location was at the very head of the Valley, where the sand dunes begin to encroach upon the river.

This ancient canal system was destroyed by Genghis Kahn and the valley was consequently depopulated. It was rebuilt by a grandson of Tamerlane in the Fifteenth Century.

In 1799 the system as rebuilt was destroyed by the Emir of Bokhara, and the valley was again depopulated and reverted to desert.

After the conquest of Turkestan by the Russian Government, the valley was added to the Emperor's Estate and in the years 1887, 1888 and 1889, the dam at Sultan Bend was rebuilt for the Emperor by the engineer Kosel-Poklevsky, a Polish Revolutionist, who had been banished to Siberia, served his term and came to Byram Ali. He made brick and hydraulic lime on the ground, of which he built the dam, upon a foundation of loess, which was recognized as unsuitable for a high dam.

To guard against accident, he built three dams so situated as each to stand one-third of the head. The lower two had no gates; the upper one had gates. All these dams were built in the dry, at one side of the river.

After their completion, a dam was built in the river channel of fascenes, earth and rock, and the water accumulated behind during the low water season. As it was closed, the bank was cut above the three dams to allow it to pass through the gates therein provided, but instead of doing so, it cut a new channel leaving the dams high and dry.

In 1895, an engineer named Andreyeff, was employed by the Estate to build a dam at Hindu-Kush, where a power plant is located, which uses for power the water that runs down the river to Merv, to satisfy prior rights. This power is transmitted to Byram Ali, and used for lighting and running the cotton machinery. The capacity of this reservoir is 10,000 acre-feet. There are three valley reservoirs with a combined capacity of 23,000 acre-feet.

The canal system from the Hindu-Kush Reservoir was built by Von Valueff. The main canal was 17 miles in length and is called the Tzar Canal. It has a capacity of 500 cubic feet per second and irrigates 5,000 acres of cotton and 7,000 acres of wheat and barley.

In April and May, 1903, came great floods, which filled the Hindu-Kush Reservoir with sediment.

In 1910, Von Valueff built the Sultan Bend and Yolatan Reservoirs. These are 12 versts apart. Yolatan Reservoir holds 55,000 acre-feet and backs water to Sultan Bend, which is located at the head of the valley, near the site of the original dam built by the Sultan Sanjar in the Twelfth Century.

Most of the structures are built of brick and are very heavy and substantial.

Sultan Bend Reservoir backs water 40 versts and has a capacity of 55,000 acre-feet.

The total storage capacity on the Emperor's Estate is about 140,000 acre-feet, but this will rapidly decrease with accretion of sediment.

Canal Sultan Yab leads from Sultan Bend Reservoir and is on the same location as the oldest known canal. It has a capacity of 800 cubic feet per second.

The total diversion capacity of the system is about 1,500 cubic feet per second, and serves about 60,000 acres of land.

Cotton, wheat and barley, alfalfa and fruit are the chief products, in the order named.

The next largest stream in Turkestan is the Sir Daria, which is, in general, about half the size of the Amou Daria and has a minimum flow of more than 15,000 cubic feet per second. The Sir Daria and the Amou Daria are the only streams in Turkestan which reach the Aral Sea, the rest being lost in the desert or consumed in irrigation.

A large number of small canals has been diverted from the Sir Daria in Ferghana, Samarkand and Sir Daria Provinces. These are used for irrigating temperate zone crops, including grains and forage plants, some fruit trees, a large amount of cotton. A large canal taking water from this river was built as a private enterprise by the Russian Emperor, Nicholas First, which taking advantage of a series of islands, diverted about 300 cubic feet of water per second into a canal with a length of about 28 miles on the river bottom, and an equal distance over the desert on the bench to the west of the river, all in the province of Samarkand. This system, however, was built on too flat a grade. Its diversion point is unfavorable and unreliable, and the entire canal is located on low ground in such way that it is difficult to carry the water to the fields to be irrigated. The ill success of this system has led to an enterprise on the part of the Russian Government to supersede the existing canal system by means of another heading further up the river and built on a heavier grade, which will command the same lands and a little more. This canal is now under construction and the main canals of the old system will be in the final plans used for drainage.

It appears to be feasible to divert the Sir Daria into a very large canal near the town of Khojend on the left bank and carry the same in a course practically westward to irrigate the vast plain known as the Golodnaya Steppe, where nearly a million acres of very fine land can be found, which is smooth, has an excellent soil, and slope favorable for irrigation. It is probable that the water supply is not sufficient to irrigate this entire tract, but this must depend upon complete adjudication of prior claims to the waters of the Sir Daria. (Applause.)

PRESIDENT FOWLER: Before we disperse I think we might recognize the character of the address we have listened to. I think I state the feelings of every delegate here present in expressing to Mr. Davis our great pleasure and thanks for the interesting lecture he has given us this afternoon.

Before you leave I want to make the request that the delegates attend to registration at once. I also want to call your attention to another very important matter, and that is, those of you who have no program will understand that the meeting of to-morrow morning is at the Auditorium Theatre. Also that there is a meeting to-night

in this hall and that we will have the pleasure of listening to a lecture by Mr. C. J. Blanchard, Statistician of the United States Reclamation Service, which will be illustrated by stereopticon and moving pictures.

MR. EDMUND T. PERKINS, of Illinois: I wish to state that the Illinois delegation will meet to-morrow morning at the north end of the lobby of the Auditorium at 9:15 to receive the report of the Nominating Committee.

The Congress then adjourned to meet at 8 o'clock p. m. at Orchestra Hall.

THIRD SESSION

TUESDAY, DECEMBER 5, 1911

8 o'clock P. M.

ORCHESTRA HALL

The Third Session of the Nineteenth National Irrigation Congress was called to order at 8 o'clock p. m. at Orchestra Hall, President Fowler presiding in the chair.

PRESIDENT FOWLER: Those of you who have been interested in the work of this National Irrigation Congress are familiar with the fact that as a result of its efforts there was passed a National Irrigation Act, and out of that National Irrigation Act grew the Reclamation Service, and the Irrigation Congress has been among the strongest supporters of the Reclamation Service from the beginning. I regret exceedingly, when we have as beautiful an exhibition before us, and as fine scenes as we have in anticipation, when I recall the fact that the speaker of the evening the last time he was in Chicago had an audience of eleven hundred, and when we come here out of our profound and deep appreciation of what the Reclamation Service has done, I regret exceedingly that we can offer an audience of only 100.

I regret that there are so many people in this city who would enjoy this entertainment and ought to have the privilege of attending this entertainment when it is given free. I deeply regret that they have not the knowledge of the meeting, for I am sure if they had the knowledge they would not let it go by without attending.

The speaker of the evening is an old friend of mine, having been connected with the Reclamation Service for years. He has been peculiarly situated in his official connection with the Reclamation Service and work. He has been peculiarly situated in coming in contact with all the projects in this country, and has had the best opportunity almost of anyone to select those things from the different projects and those views which have been taken by the official photographer, which are the most instructive and the most interesting.

I now take pleasure in presenting to you—I think most of you know him already—in presenting to you Mr. C. J. Blanchard, Statistician of the Reclamation Service, who will give you a lecture on "Making the Wilderness Blossom."

MR. BLANCHARD: Before addressing you I would like permission to read a telegram which I received to-day from the Honorable Secretary of the Interior. It reads as follows:

TELEGRAM FROM WALTER L. FISHER, SECRETARY OF THE INTERIOR

C. J. Blanchard,
Reclamation Service,
Chicago, Ill.

Please express to the officers and members of the National Irrigation Congress my regret that pressure of official business prevents my presence, and that of First Assistant Secretary Adams, at the Nineteenth Annual Meeting of the Congress. This Department and several of its bureaus are deeply interested in the delib-

erations to be held in Chicago, and are in full sympathy with the policies for the immediate development and use under sound conservation principles of the resources of the arid West. Both Mr. Adams and myself have recently made an extended tour of the West, giving special attention to public lands, water power and other problems, and particularly to the excellent results attained under the Reclamation Act. Continuation of such work and projects for future enlargement of activities in this line will have my personal consideration.

(Signed.)

WALTER L. FISHER, Secretary.

MR. BLANCHARD: I have an apology to offer the Congress to-night. Ordinarily I do not use notes in discussing the work of the Reclamation Service; but I am taking this problem of Western development from a new angle to-night, something I have not tried before, and I brought with me a large number of new slides. In order to have the slides come right in accord with my remarks, it is necessary for me to read a portion of the address to-night. I hope you will be able to hear me and that you will forgive me for not delivering this offhand. When it comes to discussing the work of the Reclamation Service I do not need any notes, but as I am getting at this from a new standpoint I am going to ask your permission to let me read a portion of my address.

Address by

C. J. Blanchard

Statistician, United States Reclamation Service

MAKING THE WILDERNESS BLOSSOM

Illustrated by Stereopticon and Moving Pictures

Mr. President, Delegates, Ladies and Gentlemen:

To the bulk of our citizens the Great American Desert is still a region apart, and illusions concerning it which obtained in the days of Webster and Clay still persist. The average citizen of the East, whose vacation is usually spent abroad, and there are more than 200,000 unpatriotic Americans who annually seek their recreation in the Old World, regards our rainless country as the habitation only of hostile savages and deadly reptiles. Millions of our people, crowded in our great cities, have never felt the uplift of its unmeasured distances and its far-flung horizons. To these the desert means desolation, thirst and loneliness, a waste place, forbidding and terrible wherein civilization has no place. Instead of a level plain of sun-baked, shifting sand, our desert is a region of varied and interesting topography, with every gradation of climate from Semi-Tropic to North Temperate. It possesses all the climates of Europe, while its scenic wonders have no rivals in any country. In our desert proper are located all the important National parks, whose 5,000,000 acres of territory embrace more natural wonders than can be found in all other parts of the world. On the northern boundary our Glacier Park contains 63 living glaciers, affording the mountain climber all the exhilaration and exercise he requires to reach the towering peaks on whose sides they rest. Its numerous lakes, fed by the melting snows, are clear and cold and alive with trout. Some of them at the feet of slowly moving glaciers are never free from the ice which is constantly falling in them. For the traveler who would commune with Nature in her wildest moods, this park extends an invitation which would be irresistible if it were known.

Our famous Yellowstone Park, the cauldron where spouting geysers make the earth tremble with their mighty force, the scenic paradise with endless and ever-varying panoramas of canyon, lake, mountain and forest, and the wild game preserve of the continent, is a national play ground, set apart and dedicated to all the people. How many of you have visited it? Less than 30,000 Americans enter this park each year.

Ranier Park, where the automobilist may climb half way to the top of one of our highest mountains, offers a succession of scenes of unrivaled beauty and grandeur.

Crater Lake, where the fires of a volcano were extinguished by descending torrents from lofty mountains, is one of the most marvelous and one of the highest lakes in the world. Deep bosomed in that wonderful pit there lies a sapphire whose radiance puts to shame the most exquisite tint of cloudless summer sky. The tourist in his automobile can approach to the very rim of the crater, which is 7,500 feet above sea level, but he must climb down a steep trail to reach the lake itself 1,000 feet below. Its depth is 2,000 feet.

Yosemite Park is a vale of wonderful scenery. Its cascades tumble over precipices half a mile high. The unrippled surfaces of its lakes hold reflections of forests and mountains which charm us with their perfection and beauty. Its placid valley and stream, its giant sequoia, its gray and somber crags, cathedral spires, and royal arches, give us a composite of grandeur and loveliness which has no equal elsewhere. It, too, is neglected by the National Congress and by our people.

The Grand Canyon of Arizona is the world's most amazing phenomenon. In all the wide range of language there are no words which adequately describe this stupendous, this awe-inspiring chasm. A remarkable tribute to this miracle of the forces of Nature is found in the confession of every eminent writer and artist who has viewed it, that words can neither describe it nor brush duplicate on canvas its marvelous colors. The most accessible of all our scenic play grounds, it too remains unknown to most of our people.

Nor are these by any means all of the attractions which the arid West offers to the tourist, the explorer, the sportsman and the scientist. Here we have a hundred Switzerlands, each with its own particular charm of scene, each rivaling the most famous resorts of Europe. An ordinary life time might be spent in an exploration of our own wonderland without covering the whole field.

To those of you who are accustomed to taking your vacations abroad, I wish it were possible to convince you that in our own country there are mountains which in sublimity and grandeur equal any in the old world. The traveler may enjoy the wonders which a prodigal Nature has lavished upon us with a greater degree of ease than he finds in European tours. Our transcontinental roads are equipped with palatial trains of the most modern construction, and the well-ballasted tracks, and thousands of miles of oiled road-bed make for comfort and pleasure. Our western resorts are supplied with excellent hotels to care for all comers. The lowest rates for transportation in the world are available for the tourist who cares to take advantage of them.

Restful lodges abound where the world-weary traveler may find peace and quiet in the shadows of forests which were growing before the Gauls overthrew the Roman Empire. Our transcontinental lines penetrate some of the wildest and most profound canyons or climb to dizzy heights in crossing the great mountain ranges.

The archeologist will find ruins as interesting as those of Egypt. The history of the vanished races that built them is still a baffling mystery. The ethnologist will find surpassing enjoyment in the study of tribes whose ceremonies bridge the age between stone and steam, who were dwelling in fortress-like homes erected on the lofty mesas of the Southwest long before Columbus sailed the unknown western seas. Their legends and mythology are as interesting and perhaps as old as those of ancient Greece.

The sunny valleys of innumerable streams are now decked with verdure or yellow with ripening harvests. In the spring the scent of innumerable blossoming orchards makes fragrant the air, and in the fall the trees are bending with their burden of luscious fruit.

Infinite variety characterizes the colors of the desert, for this is a land where the atmosphere itself has color. Strange and incomprehensible are the magical changes of tint in rock and bush and cloud at different hours of the day. These colors are often so transitory that the eye receives impressions which the mind refuses to accept as real.

It may appear to you that I have dwelt at too great length upon a phase of the West which is not related to the practical work of its development I was expected to discuss. I do not think so. My purpose is to call the attention of the convention to the very present need of awakening a larger appreciation on the part of all the people of what the West has to offer, and to ask your co-operation in our effort to stem the tide of travel toward the Old World.

The West needs more people and more money. If we could divert one-half of the present tourist travel from Europe toward the West we would hold in circulation in this country more than \$250,000,000, all of which is now annually expended abroad. I do not need to recite what this would mean to our transcontinental railroads, to our hotels, our western cities and towns.

The knowledge of the West and its resources gained by the tourist on his trip to view our scenery would increase his confidence in western securities and would encourage larger investment. The lure of this new country is so compelling that many who come would remain and take their part in its upbuilding. The returning tourist would direct others to seek the pleasures which have been enjoyed by him.

A wider knowledge of the West on the part of the whole people will in time compel Congress to abandon its long continued policy of indifference and neglect of our parks, and will bring more liberal appropriations for their management and for the necessary roads and hotels. Our new Secretary of the Interior is advocating a definite and practical policy for the administration of these play grounds of the people. He should have the hearty co-operation of every patriotic American whose pride of country extends beyond his own door yard.

Two economic problems of obvious importance confront the people of the country to-day, viz: increasing the opportunities for our citizens to acquire homes of their own, and a larger production per acre of staple crops. While we have not yet reached the acute stage in the struggle for existence which prevails in many parts of the old world and the Orient, we are not far removed from that critical period when over-population and under-production shall become vital questions with us.

This great National Congress, composed of broad-minded, progressive representatives from nearly all the states, has no more important work before it than the working out of satisfactory solutions of these problems. The enormous increase in the cost of

the necessities of life during the past decade, and the consumption by our own people of nearly all of our cereals and meat products, furnish abundant evidence of the imperative need of better farming on the present cultivated acreage and the addition of new areas.

Notwithstanding the relatively large increase in our cultivated areas, and consequent augmentation of products, the growth of population has more than kept pace. There has been a continuous and rapid rise in farm land values, with a resulting decrease in the opportunities for men of moderate means to acquire homes. Naturally the centralization of a large percentage of our population in cities has continued. Unquestionably it is true that we are not short of land, but of what avail is it if this land is beyond the reach of the great masses of our people by reason of inflation in values, or because nature has not made it ready for the plow.

This Congress has to its credit the initiation of one constructive legislative measure, the Reclamation Act, which in time will be regarded as the most valuable work of our national law-makers since the passage of the Homestead Law, which opened to settlement the Mississippi Valley. It has under consideration now another measure of equally great importance, the drainage of the vast areas of swamps, the economic value of which will be ably presented in many papers at this Congress.

The historian of recent national events finds no subject of more engrossing interest than the subjugation of our arid West. Within the past few years the development which has taken place here has been amazing. It has focused the attention of the whole country. It has changed materially the popular conception of this vast empire, which has heretofore been regarded as a liability rather than as a national asset. It has sounded a new note in agriculture, and has produced a new phase in rural life. The leaven of learning is beginning to work through the ignorance and indifference which have long prevailed concerning the Great American Desert. We have begun to appreciate in a small way that this huge territory is a heritage of priceless value, the future granary from which we are to gather the harvests for uncounted millions of our people.

The desert of our old geographies no longer has a place on the map. Its boundaries have shrunk until they are almost indeterminate, while its terrors are only traditions. As our last land of fortune and opportunity, its exploitation and development are of profound interest to the nation. The story of the quickening of the desert is replete with thrilling incident and magnificent achievement, for Nature has not rewarded those who have waged the battle without exacting a full measure of industry and courage.

To-day the homes of more than 300,000 happy families, surrounded by 13,500,000 acres of irrigated land, have been established, and the harvests contribute annually \$300,000,000 to the wealth of the farmers.

The magic of irrigation has transformed valleys long vacant and voiceless into prosperous and populous agricultural communities. It has created hundreds of cities, towns, and villages, many of which have become financially and commercially great. It has brought to the remotest parts of the desert the benefits of transportation by steam and electricity.

In this new empire, to which the young, the strong, and the adventurous are turning, there is to be a coalescing of all the Aryan races into a final race-type. In time that type will dominate the world. For the desert truly offers to every man his birthright—room to breathe, the sunshine, a sure reward for intelligent labor, the individual home, and the opportunity to become independent.

Until 1902, when the persistent labors of this Congress were crowned with victory, individual and corporate enterprise were the

only forces at work in desert reclamation. The Federal Government held strangely aloof until practically all the favorable and profitable opportunities for construction were exhausted. Though a laggard in starting, since it initiated the work the United States has made commendable progress.

National irrigation has already gone beyond the stage of prophecy. The material and substantial results flowing from the law places the work of the Government on a practical and solid foundation. Facts, not theories, furnish the arguments for continuing the work, and for increased appropriations to enlarge and extend its scope.

A brief summation of the activities of the bureau shows the magnitude of the work accomplished. These data are assembled to October 31, 1911. Construction is going on or has been completed on 29 projects, involving an expenditure of \$65,470,000. In the eight years of actual work the Service has dug 7,000 miles of canals, many of which carry whole rivers. These canals placed end to end would reach from New York to San Francisco and back to New York. The tunnels excavated, mostly through mountains, have a length of more than 19 miles. The excavations of rock and earth amount to the enormous total of 77,200,000 cubic yards. As much of its work is located in regions heretofore almost inaccessible, it has been necessary to build and maintain 570 miles of wagon roads and 1,700 miles of telephones. The Service has in operation 275 miles of transmission lines, and is furnishing its surplus power and light to several cities and towns.

It has completed three of the greatest irrigation dams in the world, and the storage capacity of its reservoirs, several of which are now full, is 10,000,000 acre-feet, or enough water to cover that many acres a foot deep.

In its construction work the bureau has purchased 905,827 barrels of cement, and its own mill manufactured 340,000 barrels, effecting a net saving of \$600,000 by so doing.

Water is now available for 1,086,000 acres of land, upon which approximately 14,000 families are residing in their own homes. As a result of the investment already made by the Government, land values have increased more than \$105,800,000. The astonishing increase in land values resulting from the reclamation of desert land is shown in a recent sale of a forty-acre farm adjoining the Government town site of Rupert on the Minidoka project in Idaho. This tract of land in 1904 was sage brush desert and valueless. This spring it sold for \$11,000. It was filed upon as a homestead, and the original entryman had paid back to the Government not more than three annual instalments of his water right, or less than \$8 an acre. On several projects a single crop has enabled the settler to repay all his obligations to the Government.

The gross value of crops grown on the projects in 1911 is estimated at \$24,000,000.

The growth and development of the towns on the Reclamation projects are proceeding along lines which have promoted numerous communities in southern California now recognized as nearly ideal centers of population. In substantial business blocks, in commodious school houses, numerous churches and in artistic and beautiful homes, these new communities are far in advance of those of many older sections of the country.

The small farms intensively cultivated and grouped about these villages and towns give the effect of suburban rather than rural conditions. Cheap power developed from the great dams or from numerous drops in the main canals is now utilized in the operation of trolley lines which reach out into the rural districts and bring the farmer in close touch with the city. It turns the wheels of numerous industrial plants, and various enterprises, in which the farmers are part owners, for storing, handling, and manufacturing the raw pro-

ducts of the farm. The same power is used in the lighting and heating of the towns, and for cooking in the homes. On several of the projects the farmers are applying for electric power, and on many farms the housewife has made it a useful servant in her domestic duties. This important and very valuable asset will in time become the property of the land owners, and will return considerable revenue to them.

The compact settlement which is the inevitable result of irrigation brings to the farmer conveniences and luxuries which heretofore were unknown to the country. The daily delivery of mail, circulating library, centralized graded schools, frequent association with neighbors in the management of their various organizations for marketing products, and in the operation of the irrigation system, have made farm life varied and interesting. In no small degree these same factors have been responsible for a noteworthy increase in the number of city dwellers who are turning to the soil for a living. The question "Can a business man without previous experience in agriculture succeed on an irrigated farm?" finds an answer to-day on a thousand Government farms where former city dwellers are making good. They demonstrate that a good business training is a very important adjunct to successful farming in the irrigated country.

A comprehensive discussion of the irrigation projects of the Service is not possible in a single evening. Each of the projects shown on the map is worthy of extended description, for each involves its own particular problem of engineering and each possesses its special attractions for settlers. I shall take up, however, only a few of the projects which by reason of spectacular or unusual features or magnitude of the works demand a brief explanation. I have made selection of these projects with some hesitation and no little trepidation, because I know there are representatives here to-night from all our projects. Those which I omit will have sponsors here who will question my judgment in selecting others and neglecting their own project. Unfortunately I had to consider the limitations of time as well as the patience of my audience, otherwise I should have been pleased to talk a little about all of the projects.

On a number of the projects every acre of land is occupied. So great has been the hunger for farms in some sections that the work could not be pushed fast enough to supply the demand for homes. Those projects possessing the most favorable climate naturally attract the most people. Idaho, California, Oregon, Washington, and Colorado, for this reason and also on account of generous exploitation on the part of state and other organizations, have received the largest influx of settlers. Every acre of land on these projects for which water is available has been filed upon.

On the Minidoka project in Idaho there were 1,014 farms, and practically every one was taken up before water was ready. On the Yuma project in Arizona the first unit opened had ten applicants for each farm.

To-day the 354 Government farms awaiting settlers are in the Northwest in the states of South Dakota, Montana and Wyoming, where a colder winter climate has had its influence in retarding settlement. I want to dwell briefly on these projects because at the present time they offer the only opportunities now available for homeseekers who wish to take up a Government farm.

HUNTLEY PROJECT, MONTANA

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The Huntley Project in many respects is one of the most attractive for people of moderate means. It is located in the fertile valley of the Yellowstone, near the city of Billings, and embraces about 30,000 acres. It has excellent transportation facilities, being located on two trans-continental lines, the Northern Pacific and the Chicago, Burling-

ton & Quincy, which reach the great markets of St. Paul, Minneapolis, Omaha, and Chicago. The farms are mostly 40 acres each, with a water right charge of \$30 per acre, payable in ten years, and a payment of \$4 per acre to the Indians, payable in five years. The soil and climate are adapted to the general crops of the north temperate zone, and in some parts to the growing of apples and other hardy fruits. Farmers have been very successful in growing sugar beets, potatoes, and peas, beans and onions for seed. A number of the beet fields yielded crops having a gross value of \$100 per acre. Alfalfa produced from four to seven tons per acre. Almost every known profession or occupation is represented among the people on this project.

As no farm is more than $2\frac{1}{2}$ miles from a station, the facilities for marketing crops are excellent. There are now 95 farms open to settlement, and the opportunity offered here for men of moderate means to acquire a home and ultimate independence is perhaps as favorable as can be found anywhere in the Northwest. The valley has an invigorating climate, and the fact that people from Virginia, Tennessee and other sections of milder climate have taken up their homes here must be taken as evidence that the winters are not too rigorous.

SUN RIVER PROJECT, MONTANA

Sun River Valley, not far from the City of Great Falls, contains one of the largest projects of the Service. More than 200,000 acres ultimately will be reclaimed. The engineering works involve the construction of several reservoirs in the mountains, and many miles of canals. The work is being done in units, one of which, at Ft. Shaw, has been formally opened. There are 25 farms unentered at this time. The soil is fertile, the climate healthful and with the completion of the new railroad which is now under construction, the valley will make rapid progress.

From time to time other units will be thrown open to settlement, so that this valley for a number of years to come will afford opportunities for settlers to secure desirable homes. The water right here is only \$30 per acre, payable in ten years, without interest.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

Northeast of the Black Hills lies a beautiful valley drained by the river from which it takes its name. The area embraced in the Government project is about 100,000 acres. In fertility of soil, favorable climate, and adaptability to general farming and stock raising, this valley is one of the most attractive in the Northwest. On my first visit to the valley in 1904 the principal industry was stock raising. This was a typical cow country, and vast herds grazed on the free public lands. A complete change has occurred since the Reclamation Service initiated the work here. Lands which could then be purchased for \$3 to \$10 per acre, and which were in native grass, are now in cultivation and selling for \$25 to \$75 per acre. The wide expanse of rolling prairie is now dotted with homesteads. Three new towns have sprung up, a branch railroad has been extended through the irrigable lands. The Mississippi Valley states are contributing a desirable class of settlers, and the day of the big ranch is over. A rich and prosperous agricultural community is rising which promises in time to rival the best districts in the state. To-day there are 36 farms open to settlement. With the completion in the near future of the high-line canal, a large number of Government farms will be ready for homemakers.

The engineering works on this project involved a number of large structures. Important among them is the diversion dam in Belle Fourche River, which turns the entire discharge of this stream into a large canal in which it is carried to a depression between two hills. This depression is closed by a remarkable earthen embankment, one

of the largest and highest ever built for irrigation. This dam has a total length of 6,200 feet, and a maximum height of 115 feet. It contains about 1,600,000 cubic yards of material, and creates the largest lake in South Dakota.

SHOSHONE PROJECT, WYOMING

Surrounded on all sides by lofty mountains on which the snow is rarely absent, the Shoshone Valley in northern Wyoming is attractive to those who seek beautiful scenery. Its climate, which is much like that of Denver, is healthful and moderate, as the influence of the high mountains tempers the heat of the summer and modifies the winter temperature. Here the Government is engaged upon a very important engineering work which has been completed in part to supply an area of about 40,000 acres. In the narrow canyon a wonderful masonry dam, the highest in the world, has been constructed, and behind it the floods of the turbulent Shoshone have been stilled in a vast lake. In the valley below an elaborate system of canals carries the stored water to the farms. Half a thousand families are now residing on the land which in 1905 was uninhabited. Three new towns have been established on the Burlington Railroad, which connects the valley with the markets of the East and Southwest. The valley is soon to be served by a transcontinental line with through trains between Seattle and Galveston.

There are now 135 farms open to filing for which the water is ready. The canal system is being rapidly extended, and in the near future additional farms will be available for settlers.

GUNNISON TUNNEL, COLORADO

In Colorado the construction of the Gunnison tunnel, which carries a river six miles under a mountain 2,000 feet high, was an engineering achievement ranking with the greatest works of the age. The harvests in the Uncompahgre Valley this year which are attributable to this tunnel are the best in its history. With the guaranty of an assured and abundant supply of water we may look forward confidently to a period of unprecedented prosperity for this favored section of the state.

MINIDOKA PROJECT, IDAHO

On the Minidoka Project in southern Idaho, the future of the settlers seems assured. The settlers who took up the land here for the most part were of very moderate means, and were unable to get the lands in cultivation. There has been some little suffering and some complaint, but the actual failures have been very few indeed. Extensions of time have been given the bona fide settlers and there is every reason to believe that another crop season will put them on their way to independence. The development of power here has given an impetus to several industries, and is promoting a healthy growth in the towns. It is interesting to remember, though not easy to believe, that the project was an unoccupied sage-brush desert in 1904. To-day probably not less than 7,000 people are living here, many of whom are enjoying the luxuries of electric light and heat from the Government plant.

TRUCKEE-CARSON PROJECT, NEVADA

This project in Nevada with its big dams combining the flow of two rivers, and its network of canals, has transformed 35,000 acres of dusty desert into producing fields, and has added a thousand families to the population of a section of the state which has been long known as the Forty-Mile Desert.

YAKIMA PROJECT, WASHINGTON

In Washington, in the valley of the Yakima River, 65,000 acres of the richest agricultural land in the United States has been given an ample supply of water and is returning bountiful harvests as the result of the Government work. The beautiful lakes far up in the mountains have been utilized as storage reservoirs. Cement lined canals have been constructed in steep-walled canyons and through rough and broken country to carry water to thousands of acres of valuable orchards. The valley is becoming densely populated and is to-day one of the most attractive sections of the Northwest.

KLAMATH PROJECT, OREGON

On the Klamath Project in Oregon, 28,000 acres were in crop this year. As an evidence of the general prosperity of the farmers it is stated that \$200,000 have been repaid to the Government by the farmers, and yet the farm mortgages for the purpose do not exceed \$3,000. During the last three years farm values have increased from 50 to 100 per cent as a direct result of the reclamation work.

YUMA PROJECT, ARIZONA-CALIFORNIA

The Yuma Project enjoyed a prosperous crop year in 1911, and the new settlers have made very satisfactory progress in getting their lands in cultivation. The Laguna dam across the Colorado River, the principal engineering feature, is the only one of its kind in this country. Its length is nearly a mile, and its width in the stream bed is 244 feet. This great weir is laid on the quicksand of this treacherous stream, and is held there by its enormous weight of 600,000 tons. An interesting feature of the system is the crossing of the main canal under the Colorado River in a siphon 1,000 feet long and 15 feet in diameter. Pressure from this siphon will be utilized for power to pump water on the high mesa near Yuma, which embraces 40,000 acres of valuable citrus lands, a large part of it public domain.

SALT RIVER PROJECT, ARIZONA

Up to date the largest single investment of the Service is on the Salt River Project in Arizona. Approximately \$9,200,000 have been expended and the work is rapidly nearing completion. Owing to the magnitude of the works and the obstacles and difficulties encountered by the engineers, the project has had generous publicity from the press of the country. The site of the most important structure was remote from transportation and necessitated the building of a wagon road 62 miles in length from the nearest railroad to the Government camp. For 20 miles the highway is across a waterless desert. The remainder of the route is through an extremely rugged mountain region. In the mountain section the roadway was constructed with great difficulty and at heavy expense. It is an excellent piece of work, and opens up one of the finest scenic areas in Arizona.

Among the numerous activities in which the engineer was forced to engage were the following: cutting millions of feet of lumber from the National Forests 30 miles away; bringing water in pipes from distant springs to supply a camp of 2,000 people; farming a large area for food supplies and forage for stock; erecting a power plant which was utilized in constructing the dam, in furnishing light for the camp, and in operating the cement-mill which the engineer erected and which turned out 340,000 barrels of cement at a net saving of more than \$600,000 to the farmers. The problem of common labor was solved by employing nearly 600 Apache Indians and teaching them the use of pick and shovel, in which they have become adept.

The Roosevelt dam was formally dedicated to the people of the valley on March 17, 1911, by former President Roosevelt in the pres-

ence of nearly 1,000 citizens. The dedicatory exercises were extremely impressive, and occurred on the top of the dam 280 feet above the stream. The motion pictures I shall show later will give a comprehensive idea of the scene and the magnitude of the works.

More than a million dollars have been invested in the development of power, toward which the farmers have voluntarily raised \$800,000. This valuable utility will belong to them, and in future years revenue from it will contribute materially toward lessening the cost of operating the irrigation system, and probably will furnish considerable profit to the owners. The sale of power to date amounts to \$144,000, with the plant only partially constructed.

This year 150,000 acres in Salt River Valley received an abundant supply of water. The enormous reservoir proved the salvation of the valley, and the value of the crops which were produced by the water drawn from it was greater than the entire cost of the Roosevelt dam and the storage works.

The Salt River Valley has already attained a high place among the most favored and prosperous agricultural sections of the world. Its citizens are among the most prosperous of the West, and in their organized efforts to encourage settlement and to promote the general upbuilding of the community they have displayed commendable zeal and intelligence. The results already accomplished predict in the near future an agricultural region which will not be excelled anywhere in this country.

FUTURE WORK

For the next few years the activities of the bureau will be directed to rounding out the plans for completing the projects already taken up.

Among the spectacular works which will engage the attention of the engineers are the construction of two enormous dams, each of which is comparable with the great Roosevelt dam, and each of which in certain features exceeds the latter.

In New Mexico the work of erecting a huge masonry dam across the Rio Grande will require at least five years of active labor and a large force of men. This structure in some respects is one of the remarkable storage works of the century. It is located in a canyon of the stream and in its cubical contents, 410,000 cubic yards, it exceeds that of the Arizona dam. Its height is 265 feet, and on top it will be 1,400 feet long. At the base it will have a thickness of 180 feet, tapering up to 20 feet at the top. It is interesting chiefly from the fact that it will create the largest artificial lake in the world, a lake 40 miles long, from 1 to 5 miles wide, and containing 2,538,000 acre-feet of water. It will cost more than \$6,000,000 but it will insure the future development of 100 miles of valley, comprising 180,000 acres of extremely fertile and productive land.

The Arrowrock dam in Idaho, upon which construction has begun, stands in a class by itself among the engineering works of the world. In its greatest height, 351 feet, it ranks all others. Its cubical contents will be 500,000 cubic yards.

At both of these dam sites the camps are interesting. In each the Government has made ample provision for the comfort and entertainment of its employees. In each there is a large reading and lounging room, and through the co-operation of the Y. M. C. A. various entertainments are given. Large mess and bunk houses have been erected for feeding and housing thousands of laborers. A general store, with a large and varied assortment of merchandise, an ice making plant, water works for domestic supply and for fire protection, machine shops, hospitals, postoffices, etc., are among the important features of these camps. Numerous cottages have been built to accommodate the engineers with their families, and from them the Government collects its monthly tribute.



SENATOR FRANCIS G. NEWLANDS
President Twentieth National Irrigation Congress

Experience and time have shown the need of a modification of some of the provisions of the Reclamation law. Among them the following might briefly be mentioned:

An amendment of the law which will permit the settler who has completed the five years residence to receive a patent subject to the lien of the Government for unpaid charges on water right.

A modification of the provision requiring the establishment of a residence upon the land within six months after filing. Secretary Fisher believes that an amendment providing for actual cultivation and improvement, with payment of annual charges during the first three years and completion of the residence term thereafter, will safeguard the interests of the Government and will lessen the number of failures.

Appreciating the difficulties which all settlers encounter during the first few years on the desert land, and the outlay of money required to establish a home and prepare the land for crops, the Secretary of the Interior in several instances has formulated a plan for graduating the payments, making the early payments small until the crop returns suffice to meet the charges for building and operation.

I am pleased to be able to report that there is little or no disposition on the part of the farmers to break faith with the Government. The delinquents are remarkably few and our eastern brothers have no reason to fear that the West will not meet its full obligation in returning the loan which the Federal Government is making. The percentage of actual failures is surprisingly small and the causes therefor are inherent in the individual rather than in any fault in the works or in the country. Given a little capital and an abundance of grit and industry, and there is little cause for failure on the part of any individual.

In the great construction work in which the Reclamation Bureau has been engaged, it has had its troubles and has made its mistakes. It entered upon a field new and untried, and covering a vast area. A fair judgment upon the work as a whole I believe will be favorable, and will furnish arguments for its continuance. (Applause.)

MR. W. E. HOLT, of New Mexico: I desire to say at this time that while we expect a man like Mr. Blanchard to do his duty and the United States expects its servants to do what they pay them for, at this time I feel that this Congress ought to give its approval in such a manner that he will understand that we appreciate the very entertaining evening that he has afforded us. I therefore move that we express to Mr. Blanchard by a rising vote our thanks and appreciation of the entertainment that he has given us this evening.

The motion was seconded and adopted amid applause, by a rising vote.

PRESIDENT FOWLER: There are hundreds of thousands of people in this city who have missed something to-night by not being here.

PROF. G. E. CONDRA, of Nebraska: I move that the officers of the Congress be requested to send a reply to the telegram of Secretary Fisher.

The motion was seconded and carried by a viva voce vote.

PRESIDENT FOWLER: In order that we may distribute this work properly among the delegates of the Congress I will ask Professor Condra to draft this reply and send it to the Secretary of the Congress, for forwarding to Secretary Fisher.

The Congress then adjourned to meet at 9:30 o'clock a. m. on the following day at the Auditorium Theater.

FOURTH SESSION

WEDNESDAY, DECEMBER 6, 1911

9:30 o'clock A. M.

AUDITORIUM THEATRE

The meeting was called to order by President Fowler, after which the Divine blessing was invoked by Rev. Frank A. Purcell.

Invocation by

Rev. Frank A. Purcell

of Chicago

In the name of the Father, and of the Son, and of the Holy Ghost, Amen. O Great God of Wisdom, bless the deliberations of this Congress. Come, O Holy Spirit of God, enlighten the minds of this, Thy people, and enkindle in their hearts the fear of Thy divine love. Our Father who art in Heaven, hallowed be Thy name. Thy kingdom come, Thy will be done on earth as it is in Heaven. Give us this day our daily bread and forgive us our trespasses as we forgive those who trespass against us. And lead us not into temptation but deliver us from all evil. Amen. In the name of the Father, and of the Son, and of the Holy Ghost. Amen.

PRESIDENT FOWLER: The first paper of the morning will be "Drainage as a Basis for Development," by W. L. Park, First Vice-President of the Illinois Central Railroad.

Address by

W. L. Park

First Vice-President, Illinois Central Railroad

DRAINAGE AS A BASIS FOR DEVELOPMENT

Mr. President, Ladies and Gentlemen: My paper will deal with the necessities for reclamation by drainage and the agencies through which it is to be accomplished. I want to make this explanation, Mr. President, with your permission, that it is not intended in any way to deprecate the work of the comparatively small reclamationists who have blazed the way for a more comprehensive treatment of reclamation by drainage, just as the small irrigationists in the West and the Salt Lake Valley, in California and Colorado, laid the foundation for the taking up of that work by the United States Government. Neither do I want to cast any reflections upon the South. There are vast areas all through the southland that are capable of supporting in contentment and happiness a largely increased population without the necessity of either reclamation by drainage or irrigation.

Mr. James J. Hill in his splendid book on the "Highways of Progress" says of the necessity of an immediate development of our agricultural resources, "The single intelligent advance made by public authority within the last quarter of a century is the reclamation law," which movement, he further states, "was initiated and financed by the railroads."

Reclamation by drainage should also become a national issue. It has been initiated by the railroads and will be backed up by them as a patriotic and wise business proposition.

If the National Irrigation Congress feels that it is embarrassed or that its work is circumscribed by geographical lines, there will undoubtedly be organized a National Reclamation Congress broad enough to encompass the entire United States.

I have been an irrigationist during my entire business life. In moments of ultra-enthusiasm I have said that you could not talk fast enough to interest me in a dry farm. I was accused of being the originator of the expression, "Rain is a substitute for irrigation, but a mighty poor one."

I have not as yet been converted from my first love. I am, however, broad minded enough to see and feel that there are other interests of equal or greater importance to our national welfare in the conservation of our resources—the most important of which is bringing under subjugation the seventy-five million acres of overflowed land—an empire in itself—distributed throughout forty of our forty-eight great commonwealths, at present adding nothing to material wealth; on the other hand, frequently breeding pestilence and spreading disease—the most fertile lands on the earth—a contribution from many states, of their very richest top soil, washed down for ages and deposited in the natural depression left by the convulsion of world-making, or to form the ever extending deltas of our great rivers; lands that now lie smothered under stagnant water, a great part of which locked in unproductivity, as it were, by state lines, can only be released by the key of our government machinery.

We all agree, I am sure, if this land is in some way released from the blighting enthrallment of water and exposed to the magical touch of the sun's rays, its purification will follow, its productivity will be eternal, its possibilities boundless, and the environments made attractive.

The agency through which this is to be brought about is immaterial. In my opinion, and in that of many others, in order that it may be done quickly, the government should undertake the work and the credit for initiating this movement should go to this Congress, which will then have accomplished the grandest, most enduring and substantial work of any body of loyal, patriotic, and far-seeing citizens in the history of our great commonwealth—the redemption of over one hundred million acres of land, capable of supporting in comfort and contentment half as many millions of people.

It is not paternalism, as some contend, to supply water to the arid lands in the manner in which it has been done under the Reclamation Act; neither is it paternalism to take from our swamp lands the same water, under the same conditions; on the other hand, it is the wisest public policy.

The basis of our prosperity lies now, and must always remain, in the soil. Unless we so regard it, disaster is sure to follow. Drainage as a basis of development is only one of the many economic problems our government must take cognizance of. It is, however, the most important at this time.

For the past four hundred years we have reveled in a wealth of natural resources. The public domain has been so extensive that land could be had for the asking. This has not only taken care of our increase in population, but by its virgin richness has kept up

the general average of production per acre. Uncle Sam has now but few farms to give away. He has disposed of over six hundred million acres west of the 95th meridian in the past fifty years.

There remains only twenty-five hundred thousand acres, mostly mountainous or arid, with some remnants of Indian Reservations which are being disposed of by lot, with a wild scramble for the most indifferent farms.

Our population is growing at an ever increasing ratio—now at the rate of over a million and a half a year. Approximately thirty per cent are engaged in agricultural pursuits. This must in some way be increased from now on or there will not be a sufficiency to feed the multitude.

The pressure is already felt in the high cost of living which, if continued, must tend to drive out manufacturing, as wages are certain to increase in like proportion to the cost of living, eventually to compel the purchase of a greater proportion of many of our requirements in localities where cost of production is lower.

The time is here now when we must give these questions careful thought—baiting the railroads and busting the trusts is fighting the wind mills—merely a symptom that we feel the pressure of something wrong in our political economy.

If we are to continue to prosper and develop, our conditions must be similar to those of nations who have continued to develop and prosper. If we retrograde we will follow the methods of nations that have retrograded. We have no monopoly of intelligence, superiority of application or superabundance of thrift.

The history of nations furnishes us with experiences ample for our guidance. Let us therefore turn to other peoples in the north temperate zone and learn our destiny.

We have two nations with which to compare—one in the neglect of a government to do for its people that which they cannot as individuals do for themselves; and the other extreme paternalism, where extraordinary things have been done by the government for its people.

For many centuries past China has neglected to protect or make available her resources. Her motto has been "do not forsake the trodden paths." Her people die of famine in one province while there is plenty in another, as there are no means of transportation other than the rivers and canals and the back of the coolie. Her forests are devastated; the flood waters, unrestrained, carry ruin to the farms and destruction to the towns. The mountains are being washed down into the valleys, leaving bare the rocks and stone, creating barren wastes by gravel deposits, where once crops were grown in the valleys. There are scarcely any railroads, poor public highways, no general supply of water for domestic purposes, few sewers, and very little public lighting. Every province levies tribute on the products of others attempting to pass through them—an intense, stoical, frightful struggle for existence.

The farming is primitive and intense. There is little ornamentation or cultivation of fruits or luxuries. There is no room for weeds or flowers, shrubbery or trees. The maximum of production of that which is highest in nutriment is absolutely essential to existence. A drought, flood, or other adverse condition plunges the afflicted peoples into a famine to perish by thousands.

The war now in progress in China is a rebuke to the Manchu Dynasty for its neglect of the people. There was formerly under the Mings, governmental supervision of the general utilities. Canals were built for irrigation and transportation. The Grand Canal from Peking to Hangchu, over seven hundred miles in length, is the most stupendous work of this character in the world's history. The Great Wall skirting the Mongolian Plateau from the sea coast westwardly for 1,550 miles marking the northern boundary of China, is without excep-

tion the greatest single construction of mankind. Splendid highways and magnificent bridges were built, enduring even through neglect longer than any modern construction can hope to do.

In recent centuries, although the population has been increasing rapidly, there has been no paternal care on the part of the government for their sustenance, until now the question of the survival of the people is forcing a change in the government.

Li Hung Chang was sent out a few years ago to solve this problem, and in a trip around the world he asked many questions. Upon his return he reported that the Chinese must supplement their rice with wheat, and that the wheat must be purchased in foreign countries; to purchase it China must become a manufacturing nation, and to become a manufacturing nation they must modernize, which means the building of railroads, and other government agencies for the general good—a return to paternalism, which is the awakening now going on.

Our interest therein lies in the fact that the Chinese have the cheapest labor in the world. The women in the silk factories of Shanghai are paid eleven cents for eleven hours' work. At Hangyang steel mills men get three dollars per month; miners earn eight cents a day; coal is produced for thirty-five cents a ton; common labor is seeking employment at four cents per day; farm hands get from five to six dollars per year and their keep.

Wages, like water, will seek a level—protective tariffs and closed gateways may dam it back for a time; when the six hundred millions of people in China learn modern warfare they are going to ask us to be more liberal in our views as to exclusion and tariffs.

We take for the other comparison a nation where paternalism has, from necessity, been paramount. There is no other country in the world that has been so extensively modified by governmental agencies as Holland. Only in a few localities is it unnecessary to protect the country with sea dykes, of which there are over 1,550 miles—almost the exact length of the Great Wall of China. One of those typical is the West Kappel Dyke—12,468 feet long, 23 feet high, with a seaward slope of 350 feet, protected by piling and rock. On its ridge, thirty-nine feet broad, there is a highway and a railroad. Inland there are miles of canals used alike for drainage and transportation, all of which has cost hundreds of millions of guilders, making possible the homes of a contented, thrifty, and populous race, whose ships enter every port in the world; whose wealth is evidenced in investments, not only in this country, but in nearly all others. Its principal cities—Amsterdam, Rotterdam, and the Hague—are not only money markets of world's importance; they are centers of learning, art, and the sciences. There are many provincial scientific societies and those of general utility, such as the Society for the Service of the Country; the industrial societies, and those having to do with agriculture.

Its drained lands have, through intelligent and intensive farming, been brought to produce thirty-five and one-half bushels of wheat to the acre; fifty-three bushels of oats; two hundred thirty-two bushels of potatoes.

Holland's principal agricultural products include stock breeding, butter and other dairy products, grain, hemp, bulbs, sugar beets; its manufacturing—cotton and woolen goods, linen, iron works, machine factories, ship building, cigars and snuffs, sugar, glass, crystal, earthenware, brooms and mats, carpets, diamond cutting, gold and silverware, distillation of liquors, leather tanning, shoes and leather goods.

Government built and maintained roads and canals make transportation and living cheap, so that this small country, only 154 miles from north to south, and in breadth only 144 miles, supports a dense population in contentment and happiness.

Holland will continue to progress, and China is awakening to

follow her example. There is undoubtedly to come at once, in the Flowery Kingdom, an outward thrust of the products of her labor, if not her peoples. Many other countries besides the two used for a comparison are factors in our political economy. There must come a lowering of wages in this country unless we are active in preserving present conditions. We must make available our utmost agricultural possibilities. This is to be accomplished in two directions, by restoration and reclamation. Our impoverished lands must be fertilized and rotated back into their natural condition by intelligent farming, in which the government must be a paternal factor, with its agricultural schools and experimental stations. This will take time and will not come fast enough to feed our rapidly growing population. The immediate relief is to be found in the continued reclamation of virgin lands by irrigation and drainage of overflowed lands.

Our development by drainage now holds out the greatest promise for the reason that such lands when drained can be irrigated and made to produce crops continuously—in this way supporting a dense population. No matter how soon this work is commenced, it will be none too soon.

I would abate not one iota of the government activity in the arid West. It is a part of the work of drainage in the holding back of the flood waters—equalizing the moisture essential to crop production between the highland and the lowland go hand in hand; that which helps the farmer in the arid country by impounding the flood water relieves the farmer in the valley of a superabundance, so that there is mutuality of interest between the irrigationist and the reclamationist.

The irrigationist of the West appealed to the South when the present Reclamation Act was before Congress with such arguments of mutual benefit, to the effect that the bill authorizing the government to take over the work of reclamation of the arid lands received the votes in the Southern states necessary to make it a law. Now that the South comes to this Convention asking that some body of experts be given the authority under the same identical condition to reclaim their lands you can ill afford to offer the selfish excuse that reclamation means the West only; that Uncle Sam has no paternal care except for those beyond the 100th meridian. It won't do—you must indorse reclamation of swamp lands; you must be broad minded enough to let others profit by your experience.

It was not impossible for individuals to conserve the flood waters and lead them to the thirsty soil. It was slow—painfully slow, and the government was called in with magical effect. It is practically impossible to lead the waters off the land by individual efforts, for the reason that there are imaginary lines—state lines—that must be obliterated to the extent that one centralized power can say and do that which is for the common good. The task is also so stupendous that it requires a perpetual and powerful agency to negotiate it. The history of Panama Canal construction is proof conclusive that such undertakings require the knowledge, stability, power, and resources of a vast organization—no less than that of the government itself. To such an organization the task is mere routine. The government engineers tell us that handled in this way the cost is comparatively small, and under the provisions of the bill now in Congress the funds are to be furnished by the beneficiaries as they are needed, except the first advances essential to start the automaton of governmental activity.

The question of Reclamation should be embraced in the work of this Congress for the reason that it has gathered into its membership those of strong convictions, well defined purposes, and unselfish patriotism. The work of the National Irrigation Congress, covering nearly a quarter of a century, has won the confidence of the people. It has disclosed no ulterior objects. Its intelligence and business

acumen have eliminated the theorists or impracticables, who contend that there are other methods than those of the government.

If drainage is undertaken and accomplished upon any comprehensive and extended scale, looking to the good of the whole people, government methods, machinery, and men will be employed.

The government organization is your organization and my organization. There is an assurance to the prospective homeseeker that he will not become involved in some impracticable scheme or wildcat speculation. The officials and employees of the government are the servants of the people. There is little of lost motion or waste. There is no possibility of receiverships, protested checks or passed pay rolls. Individuals do not count. There are substitutes for every position, good engineering, clean accounting, system, and continuity of effort. Above all, there is that identified with the work—the integrity of the nation—which inspires those who are employed under the Stars and Stripes to the best that is in them—a patriotism and pride in a great and lasting work for mankind that must ever remain a monument to those concerned in it.

PRESIDENT FOWLER: The next paper will be "State Aspect of Drainage," by Judge R. V. Fletcher, of Illinois.

Address by
Judge R. V. Fletcher
of Illinois

STATE ASPECT OF DRAINAGE

Mr. Chairman and Members of the Congress, Ladies and Gentlemen: I wish to say in the outset that the publication of my name upon the program as speaking for Illinois is hardly accurate. My residence in the State of Illinois has been so recent that I have had no opportunity to familiarize myself with your peculiar problems, nor am I authorized in any sense, either by residence or citizenship, to speak for this great state.

As a matter of fact, all my adult life has been spent in the State of Mississippi, and whatever familiarity I have with local conditions in any of the particular states is limited to conditions in Mississippi. I think this explanation is due, not so much to myself but to the State of Illinois in order that those who may hear what I have to say may understand why I have laid emphasis upon problems in which the State of Illinois is perhaps only incidentally and indirectly interested.

It has fallen to my lot to discuss, very briefly and in the most general terms, some aspects of the great question of reclaiming swamp lands through the agency of the national government, as the same should be viewed by the various states involved. It may be, too, that owing to my natural interest in the legal problem involved, as well as the inherent relevancy of the inquiry to the matter in hand, I shall find a little time to consider the important question of the power of the federal government to prosecute this work in the light of the limitations placed upon its activities by the Constitution of the United States.

I feel that it has here been amply demonstrated that this question is not in any sense a local one; that the very nature of the project is such that no one state, however active, intelligent, and efficient it may be, can independently undertake and successfully prosecute a work demanding absolute concert of action and uniformity of plan and methods, and extending over vast stretches of territory crossed by

state lines. It may be taken as incapable of refutation that if the drainage problem is left to be dealt with independently by the several states, according to the capacity and peculiar views of each, nothing of a satisfactory nature will be accomplished. Small local communities may perhaps be benefited temporarily, at least, but the hopes and visions of those who view the problem broadly and see in the future a consistent scheme of swamp land reclamation in which every part shall bear a consistent and helpful relation to every other part will be certainly disappointed.

Nor is there reasonable hope of accomplishing the desired end by any voluntary concert of action among the several states. Objections to such a plan readily suggest themselves. In the first place, the working out of such an idea will involve a sad waste of invaluable time. I would imagine that to accomplish this result, it will be necessary to organize a propoganda in each of the states to educate public opinion as to the importance of the work and the method by which it is to be accomplished. The legislatures of the several states, after years of pressure from the people, may appoint expert representatives of each state to come together and agree upon a consistent and harmonious system—one which will do justice to all, and which will not injuriously embarrass the work of the national government in its effort to preserve the navigable streams of the country as great high-ways of interstate commerce.

It is easy to picture the result when this body of engineering experts, each naturally zealous in behalf of his own state, shall undertake to agree upon the details of a plan which all shall adopt and consummate. As long as the infirmities of human nature continue, it is to be expected that there will be some lack of entire disinterestedness in the attitude which men assume when their self-interest is involved. And so we can readily foresee in this convention of engineers distinct difficulties in the way of reaching common ground—difficulties which would certainly delay, if they did not wholly prevent, a complete agreement.

But if a common plan should be finally adopted, this plan must be submitted to the critical examination of the chief executives and legislatures of the several states. In the meantime the inevitable brood of hostile critics would not be idle. Our ancient friends "pro bono publico," "veritas," and "citizen" would fill the columns of local papers with unkind references. There would be found in every state a number of men armed with facts and figures ready to prove that that particular state had been betrayed by its ignorant or perhaps venial representatives. The plan would be amended here, conditioned yonder, postponed in a third. In the meantime the swelling tide of an enormously increasing population would further lift the price of living and add to the perplexities that confront a nation with a relatively diminishing food supply.

Adverse action on the part of a single state involved in the scheme would as effectually defeat the entire plan as would the unanimous rejection by the states. I think thoughtful men will readily agree that the problem involved in reclaiming our vast expanse of swamp territory cannot be solved by the states acting either independently or by concert of action. Whatever is done, therefore, must be done under the general direction and control of the general government.

What should be the attitude toward this project of the states and of those citizens of the states, who, like myself, cling with desperate tenacity to the so-called doctrine of states' rights; who believe that the federal government is one of expressly delegated powers, and who resent every encroachment by the general government upon the field of the reserved powers of the states? Is a friendly attitude toward drainage by the national government inconsistent with the strictest adherence to the doctrine of the complete sovereignty of

the state in the domain of their undelegated powers? In considering this question, I am not to be understood as writing with my eye on the text of the Constitution of the United States. I am not arguing from the viewpoint of a strict and literal constructionist who parses out the phrases of the Constitution seeking for express authority, as a lawyer examines a written contract to determine his client's rights. I rather try to adopt the mental attitude of the framers of the Constitution who sought with the lamp of experience and the eye of prophecy to determine what objects were so fundamentally national in their scope as to prohibit their being managed by the states.

In the beginning of our life as a nation it was evident that if we were to take our place in the commonwealth of nations, we must in certain channels of governmental endeavor speak as a nation, act as a nation. Many important questions inevitably so affect the common good and promote the general welfare that the framers of the Constitution, jealous as they were of the prerogative of the states, were driven to place their control in the hands of the general government. In this class fall the management of foreign affairs, the establishment of postoffices and post roads, the control of the currency, the supervision of interstate commerce, the administration of a bankrupt's estate, the naturalization of foreigners, dealing with patents and copyrights, supporting armies, declaring war and many others of such a nature that local governments must inevitably fail in their efforts to control them.

Bearing in mind the true genius and spirit of our scheme of government, there can be no encroachment upon the legitimate sphere of a state's activity, whenever the general government assumes control of any proposed plan for furthering the general good which the states are incapable of performing. It is no part of any enlightened policy of states' rights that the states shall assume a dog in the manger attitude toward measures admittedly for the promotion of the general welfare. The participants in the great struggle between the advocates of conflicting theories as to the true relation governing state and federal control were in accord as to the real nature of the powers granted to the federal government.

Let it be admitted for argument's sake that the federal government is but an agency of the states created for a specially designed purpose and with strict limitations upon the scope of its agency. To determine whether a power exercised by the federal government contravenes the doctrine of States' rights, it is only necessary to decide whether such power is within the scope and purpose of the agency. Applying this test to the question in hand, and remembering that the drainage of these vast areas can not be successfully handled by the states, it would appear to be sheer folly for the states to assume a hostile attitude toward this benevolent enterprise. Indeed there is nothing in the history of those states most jealous of their prerogative to indicate that the support of the national government would be unwelcome.

At present in nearly, if not all the states of the Union, government aid is extended to agricultural and mechanical colleges. Large grants of land by the government to state universities are gladly received. In my own State of Mississippi, more than five and a half million dollars have been expended by the national government in co-operation with the state in extending and improving the levee system, whereby the waters of the Mississippi are in some measure controlled. While this expenditure may find its legal justification on the ground that it is for the benefit of navigation, yet manifestly its chief purpose is to protect the lands. In the matter of eradicating insect pests and contagious diseases among live stock, the activities of the agricultural department have never been repelled except in isolated cases, due either to ignorance or fanaticism. I recall distinctly at least two

instances in recent years where the general government, at the invitation of many patriotic citizens of Mississippi, came quickly and generously to the aid of our afflicted people, destitute and suffering as a result of storm and flood.

Personally, I have little fear that any considerable number of influential citizens in the states will object to the general government taking charge of this monumental project. The fostering hand of the general government will be all the more welcome in those states where several years of experience have demonstrated to the people at once the value of drainage and the impossibility of accomplishing the best results under the state laws. If I may again refer to the State of Mississippi, with whose conditions I am most familiar, I feel safe in saying that this soil is good ground for the nurturing of missionary effort toward creating sentiment for federal control. The people of Mississippi, both in the Yazoo-Mississippi Delta and in the hill section, have long been alive to the advantages of systematic drainage. In many of the counties in Northeast Mississippi, communities have availed themselves of the provisions of state laws, have organized drainage districts, have issued bonds which were first liens upon the property in district, have taxed themselves with a large annual acreage tax for a series of years upon land which was valueless before drainage. These people have recognized in many cases the futility of isolated effort.

I have in mind one instance in which the citizens of one county found useless for years all their efforts to confine a stream within its banks because the property owners just below in another county would not co-operate. Finally, however, differences were adjusted and the canal was constructed. As a result land, once scarcely worth buying at a tax sale, is now largely sought at \$50.00 to \$75.00 an acre. Land owners with such an experience are likely to be enthusiastic for a comprehensive scheme of drainage and not averse to any control which will insure harmony of action and the execution of a consistent plan. The most ambitious drainage scheme undertaken in Mississippi is a plan now being worked out for the reclamation of a vast body of land lying within the boundaries of what is known as the Yazoo-Mississippi Delta district. This plan has been advancing slowly under authority of a state law creating the Tallahatchie drainage district. It may not be here amiss to mention that the future of this enterprise seems to be somewhat imperiled by a decision of the Supreme Court of Mississippi nullifying another act somewhat similar in some of its features on the ground that the particular act under review was in violation of the prohibition of the Mississippi Constitution relating to local and private legislation. However that may be, I mention the Tallahatchie drainage proposition here for the reason that the engineers in charge of the enterprise have received with open arms the active assistance of government engineers in making preliminary surveys. I have no idea that any considerable opposition will manifest itself on the part of the most extreme advocates of the states' rights doctrine.

This result will unquestionably follow if it can be shown that there is constitutional warrant for this exercise of power on the part of the general government. The limits of this paper will not justify any extended consideration of this question, but I confidently maintain that there is good ground for the hope that the right of the general government to take control would be upheld by the courts should the matter come to a test in the courts. In considering this question, reference will naturally be made to the course of legislation and decision on the subject of the "Reclamation of Arid Lands" in the West. When the right of the federal government to promote this enterprise was questioned it was held by the courts that the right could be upheld upon the ground that the federal government was a large land owner in the arid district and unquestionably had a right to improve its own

holdings. If there was privately owned land lying in such position that it was necessarily included with government land to make a practical reclamation district, this fact could not tie the hands of the general government and block the whole scheme of improvement, especially since the United States government was acting in harmony with all the agencies of the state and in conformity with all the laws of the state on the subject.

Applying this holding to the question of drainage, it is, of course, obvious that if the United States government is the owner of any considerable quantity of swamp and overflowed lands lying within the borders of the states affected, the problem is easy of solution. In reclaiming this land, it has all the rights of a private owner, and if in reclaiming this land it is found expedient to adopt a system of drainage which affects large tracts, there can be no objection if the government co-operates with private owners in organizing and establishing an effective and economical system under the general direction of the agents of the United States. Such is the doctrine of the Burley case, and its conclusions find much support in the language employed by the Supreme Court of the United States in *Kansas vs. Colorado*, 206 U. S. 46.

The matter of reclaiming by drainage such lands, in the several states as may properly be described as swamp and overflowed lands, is complicated by the fact that Congress by its Act of September 28th, 1850 (9 Stat. at Large 519) granted to the several states, except Kansas, Nebraska and Nevada, the whole of the swamp and overflowed lands made thereby unfit for cultivation, the purpose being to encourage the states to reclaim the lands by a suitable system of drainage and levees. By virtue of this grant immense tracts of land in the different states have been surveyed, identified and patented to the states, these lands as a consequence passing entirely out of the control of the general government. The quantities thus patented to the states vary in amount very greatly, ranging from 418,000 acres in the case of Alabama to more than 20,000,000 acres in the case of Florida. The act of Congress provides that where the greater part of a legal subdivision is wet and unfit for cultivation, the entire subdivision shall pass by the grant, but where the greater part of such subdivision is fit for cultivation no part of the subdivision shall pass.

It has been held that by the terms "legal subdivision" as employed in this act, there is meant the lowest legal subdivision or 40 acres. It may be that by reason of these provisions of the Act of Congress there yet remains as part of the national domain a very considerable portion of land a part of which at least is wet and swampy. But however this may be, the fact that the states have acquired title to this great body of swamp land does not present an insuperable obstacle to the scheme for national reclamation. I have no statistics before me showing what portion of the swamp lands so granted has been patented by the states to private owners. Doubtless, we will be safe in assuming that a very considerable quantity of this land, especially that part where drainage is most expensive, yet remains undisposed of as a part of the state's public land. This land is practically worthless in its present condition, as has been here amply demonstrated. Neither the state nor the citizen can hope ever to improve it sufficiently to make it valuable.

It will be an easy and simple matter under the stimulus of a quickened public sentiment for the states and the national government respectively to enact legislation by which the states will cede to the general government, and the general government will accept, all swamp and overflowed lands which have not become the subject of private ownership. Such action will be strictly in accord with the objects and purposes of the original act of September 28, 1850, that the grant to the states is solely for the purpose of enabling the states to con-

struct necessary levees and drains to reclaim this land. It now appears after an experience of more than sixty years that the states are wholly incompetent to fulfill this trust. And this failure to do so is attributable not to general inefficiency but to the inherent difficulties that attend the effort to accomplish a great national project extending over many states by the sporadic, non-co-operative, and independent action of the several states.

It is fit and proper, therefore, that the original mistake made in granting these lands to the states should be corrected, and that the national government should resume the trust which it alone is capable of discharging. Nor do I know any reason why appropriate legislation should not be enacted permitting private owners to cede these worthless lands to the general government. Such owners ought to perceive that only in this way will it be possible for the lands to be reclaimed. And how infinitely better it would be to receive back these lands from the government, though charged with the expenses of improving it, than that these lands should remain subject to taxation and absolutely without revenue producing capacity. It occurs to me that if such cessions are made by private owners, such owners could be given preference in disposing of the lands after reclamation.

There is another and quite distinct view of the matter which has occurred to me. It may be that students of the drainage problem have already given the question careful consideration and have either definitely accepted or definitely rejected the idea. My unfamiliarity with the history and literature of the movement must be my apology for referring to this if it is already beaten ground. It is well known that the Federal Congress as early as 1796 declared all navigable rivers public highways, and it was early held by the Supreme Court that the power vested in the general government to regulate commerce between the states and with foreign nations carried with it the control of the navigable waters of the United States. Acting upon this thoroughly settled principle, the Congress has enacted a large body of legislation dealing with the improvement of navigable rivers, obstructions to navigation and other phases related to the same general subject. Vast sums are regularly appropriated from the national treasury for the improvement of navigable streams, and these sums are disbursed regularly by federal boards and federal commissions.

The power of the federal government, if it chooses to exercise it, is plenary in respect to all matters that have a direct bearing upon the navigability of these great highways of commerce. When the government has concluded that levees should be built to confine the waters within a comparatively narrow channel, it has not hesitated to construct them though land-owners who are thereby protected from overflow may be incidentally benefited. It is upon this theory that the general government has expended more than 5½ million dollars in constructing levees in Mississippi. In this work the government co-operated with the agencies of the state, by which agencies more than 17 million dollars have been expended.

Manifestly, if the government has authority to build one-fourth of the levees in Mississippi, it would have authority to build them all. This expenditure of public national funds was obviously justified upon the theory that the construction of levees has such a direct and immediate bearing upon the navigability of the Mississippi that control over the river carries with it the right to supervise all the agencies and natural forces that affect the volume of water, its distribution and flow. That such waters should have a definite channel, that the supply should be kept as nearly uniform throughout the year as possible, that the supply should in many cases be increased and in others possibly diminished, that water may in the interest of navigation be diverted from one stream to another, are all perfectly evident. It ought to follow that the jurisdiction of the federal government over

navigable streams is sufficient to extend control over such aspects of the water supply as having a bearing upon the navigability of the streams traversing the different localities.

Of course I am without training in the technical features of drainage and am not in the slightest degree prepared to discuss intelligently the question of what would be the influence upon the navigability of streams of a complete system of drainage whereby waters would be confined in regular channels and made to flow as the engineer dictates. I do know, however, that one must bear some relation to the other. In this connection I may mention an Act of Congress enacted June 28, 1879 (21 Statutes at Large 37). This is the Act creating the Mississippi River Commission, a body that has for many years exerted a powerful and beneficent influence over navigation on the Mississippi river. By Section 4 of this Act, it is provided: "It shall be the duty of said commission to take into consideration and mature such plan or plans and estimates as will correct, permanently locate and deepen the channel and protect the banks of the Mississippi river; improve and give safety and ease to the navigation thereof; prevent destructive floods; promote and facilitate commerce, trade, and the postal service, etc." Clearly the prevention of destructive floods, which is here committed to this national commission, contemplates the control of waters that are discharged into the navigable streams—a control that can be effectuated only by establishing a system of drainage more or less complete. That such drainage would in numberless cases render public roads over which the U. S. mails are carried passable is quite obvious.

The limits upon my time will not permit an elaboration of this idea. I mean this paper to be only suggestive. But it seems to me that if the right of the federal government to undertake this system of drainage is challenged, it may well be answered that such a plan will have a direct bearing upon the navigability of our streams—a subject over which the jurisdiction of the federal government is unquestioned. All of us know that the alleged restraints of the Constitution have been ineffectual to stay the wheels of this nation's progress. At every great emergency in the history of this country, there have been outcries against the only method which the wisdom of statesmen could devise whereby the manifest destiny of the nation would be fulfilled on the ground that progress of the nation was over the bleeding corpse of the Constitution. But it is not recorded that there was not a way found by which that great advocate of strict construction, Jefferson, could acquire the territory of Louisiana, and Henry Clay could establish a system of protective tariffs, and Abraham Lincoln could suspend the writ of habeas corpus and emancipate the slaves, and William McKinley could acquire Porto Rico and the Philippines, and Grover Cleveland could settle the railway strike in Chicago and Theodore Roosevelt could guarantee the independence of the Republic of Panama. I have no serious doubt that ample warrant can be found in the Constitution for this great national project.

I contend that this drainage scheme is national in its scope, and of such a nature that only the nation as a nation can accomplish it. The states, however strong they may feel upon the subject, will find the task beyond their power. When it is demonstrated that an important, necessary and beneficial enterprise, making for the general welfare and promotive of the common good, can not be carried out by the states, then the execution of such an enterprise is one of the precise things for which the general government was created, and no question of states' rights is involved. I believe that the intervention of the general government will be welcomed by the states, and that no Constitutional inhibition will stand in the way. (Applause.)

During the delivery of Mr. Fletcher's address, the time limit allotted to each speaker having expired, the following action was taken.

MR. J. C. CLAIR of Illinois: Mr. Speaker and gentlemen, the paper being of such interest and value I move you that—

PRESIDENT FOWLER: Mr. Clair, I will anticipate that motion I think by saying that the speaker has two minutes remaining, and at the end of that time, by the consent of the delegates, of which I think there is no doubt, his time will be extended sufficiently for him to finish his paper. (Applause.)

JUDGE FLETCHER: I am under obligations to the Chair, and to the body.

MR. KURT GRUNWALD, of Colorado: I have a resolution to present, Mr. President.

PRESIDENT FOWLER: Will you send it up to the Secretary, please?

It might be well to call the attention of those who are seated in the rear to the fact that you can hear much better if you will move down to the seats in front. While we are completing this moving from the rear to the front I will ask the Secretary to read one or two telegrams that he has in his hands, and that may need attention.

SECRETARY HOOKER: A telegram from John T. Burns, Secretary of the International Dry Farming Congress at Lethbridge, Alberta:

"Seventh International Dry Farming Congress sends greetings to your splendid organization and congratulations upon progress of irrigation development during past year. Sixth Congress at Colorado Springs unanimously adopted resolution endorsing work of the Irrigation Congress, urging its value as a world agency in the development of agriculture."

(Signed) "JOHN T. BURNS,
Secretary."

A telegram from S. A. Hull, Chairman the Convention Committee, Commercial Club, at Seattle, Washington:

"Referring to recent letter Seattle wants your next meeting. Our natural attractions are strongest bid, but will consider your request for guarantee. Wire our expense amount required, when and how payable.

(Signed) "S. A. HULL,
Chairman, Convention Committee."

PRESIDENT FOWLER: This telegram from Seattle will be referred to the Committee on Permanent Organization. With reference to the telegram from John T. Burns, of the International Dry Farming Congress, what action will the Congress take on that? Will you authorize the president and secretary to make proper reply to the same?

JUDGE FAIRWEATHER: I move the president fittingly acknowledge the telegram.

The motion was seconded and carried.

PRESIDENT FOWLER: The next paper to which we will listen will be by Judge Hunter C. Leake, of New Orleans, "Reclamation a National Duty."

Address by
Hunter C. Leake
of Louisiana

RECLAMATION A NATIONAL DUTY

In the year 1803, Robert R. Livingston, United States Minister to France, acting without federal authority, purchased from Napoleon, who thereby violated his promise to Spain, 1,000,000 square miles known as the Louisiana territory, at a total cost to the United States of about four cents an acre. It was the best stroke of diplomacy in the history of the United States.

That imperial domain is beyond a doubt the richest agricultural region in the world. Livingston looked into the future, foresaw the coming needs of the rapidly developing Republic, and provided therefor.

After one hundred years and more we find that the development and cultivation of the naturally drained and least fertile portion of the Louisiana purchase has contributed enormously to make the people of the United States prosperous and comfortable, and that the lure of these least fertile lands has drawn many millions of homeseekers from the older countries of Europe.

The more fertile portion of the Louisiana purchase has as yet been scarcely touched. I refer to the extensive area known as the wet and overflow lands, the alluvial prairies, the lands built up by silt deposits from the overflowing rivers, the soil that will support a dense population when, through soil exhaustion, artificial fertilization and costly operations, cultivation of the remaining lands of the country will impose a greater and greater burden of food cost on our people.

The drainage, development and cultivation of these now unused alluvial lands have not only become a necessity, but that necessity has opened the way for a new era in prosperity, and the adoption of a reclamation-by-drainage policy by the federal government will inevitably prove the greatest, the best and the most profitable business stroke ever credited to the United States.

There are in round figures 70,000,000 acres of alluvial lands in the United States that are now too wet for cultivation. At an average cost of about \$10 an acre these lands may be drained and made available to the plow.

Available to the plow, they will be worth, at a low valuation, \$100 an acre. Here alone is a profit of 1,000 per cent.

This 1,000 per cent is only the initial and smaller profit to accrue. There is no means by which the broad ramifications of such a developed asset may be traced to finality, or the benefits to be derived from an augmented food supply, an augmented commerce and an augmented national wealth may be calculated.

We must stop for the moment at the \$7,000,000,000 of tangible usable wealth created at an outlay in round figures of \$700,000,000, or 10 per cent of the initial returns.

There is no other project on earth that offers such a sure and such a splendid cash profit on capital invested, or such a sure and permanent means of checking the advancing cost of food, the cause of which is a relative increase in demand over production.

Some years ago two-thirds of the country's population engaged in agricultural pursuits.

To-day, only one-third of the country's population is so engaged. Yet agriculture, the history of which is the history of man in his most primitive and most enduring form, is just as honorable a calling

as it was in the days of the early Roman Republic, when Cincinnatus was twice called from the plow to the highest office in the state. Hence, the reason for this relative decrease in rural population must be sought elsewhere.

Some eminent personages have asserted that the lure of the city in contrast with the lonesomeness of the farm has drawn the boys and girls away from the soil. But modern roads, quick transportation, the rural free delivery, the automobile and the telephone have brought the farm and the farmer into close touch with the world; modern markets and the telegraph have given the cultivators of the soil an opportunity to become business men; modern finance and country banks permit them to become merchants as well as producers; the profits from intensive farming have demonstrated the need for change in their method of doing things. The farmer now walks in the bright light of knowledge, whereas he formerly stumbled in the dim light of experience.

Where then does the trouble lie?

I will tell you.

The son of the soil now demands the same relative return from his brain, his education and his labor that men in other walks of life enjoy. Under the old order of things he cannot get it.

During the first hundred years of this Nation's life there was too much extensive husbandry and not enough intensive farming. Land was abundant and cheap, and much of it drained itself. The pioneer, believing the supply of land inexhaustible, selected a patch, killed off the trees, cultivated it until the soil was exhausted, and then moved to another. In this way the increase in population being enormous, great and rapid inroads were made on the country's natural resources of soil. In time all the naturally drained and naturally watered lands became absorbed, and a great deal of it exhausted, and a few years ago, to encourage the farmer, the federal government found it necessary to place water on the arid lands of the West, where men and women who desired to engage in scientific agricultural pursuits might build and develop their homes. Those lands are now taken up and have become very valuable, and other fertile, low-cost farms by the tens of thousands are needed.

Such farms, meeting in every way the requirements of the modern educated farmer can be obtained only through the opening up of the 70,000,000 acres of alluvial lands, consequently the drainage of these lands must engage not only the attention of the states in which they lie, but of the federal government as well, since the permanent prosperity of the nation not only depends upon the volume and stability of the food supply but on a low average cost of production, both of which are obtainable only under the most favorable conditions of soil, of climate and of convenience which these remaining acres alone can supply.

A red clay hill cannot be cultivated as cheaply as river lands, nor be made to produce the volume of crops. Carry this trite and obvious assertion to finality, and it becomes evident that intensive cultivation of the 70,000,000 acres of richest soil in the country will not only increase, relatively and actually, the nation's food supply, but it will decrease, relatively and actually, the average cost of food to every family in every section of the country.

It follows, then, that every dollar invested by the federal government, every trained man employed, and every effort and encouragement made to hasten the day when every acre of fertile, low and now undrained land shall have passed under the plow will be time, money and energy well spent in the interest of all the people for all time to come.

I am not familiar with the individual problems of engineering involved in the reclamation of the lowlands in the various parts of

the country, but from a layman's point of view there would appear to be nothing terrifying to those splendid engineers who have made the Panama Canal a near fact after the repeated failure of others, and have tunneled water through the Rockies to the arid lands in the West.

As a matter of fact, our experience in Louisiana, where reclamation work is progressing rapidly and entirely successfully aided by the state, by private capital and by indomitable pluck and ambition, shows conclusively that the 70,000,000 acres of low land in the country can be reclaimed at relatively low cost, and made enormously productive within a period of a very few years.

In Louisiana there are 3,000,000 acres of alluvial prairie, which has been built up by the soil wash of the continent brought down in solution by the Mississippi River and deposited as silt during high water. In this way nature created a veritable store house, a savings bank of soil wealth for the use of man as soon as general need for an expanding food supply and the invention of the modern steam shovel and automatic ditch digging machine should clear the way for him to use it.

In Louisiana there are also 2,000,000 acres of cypress swamp, the timber of which has a value of many millions, and the soil of which when drained will excel in productiveness any land in any portion of Europe, Holland and the reclaimed fens of England not excepted.

Then there are 2,000,000 acres of diluvial lands which are covered with the richest sort of humus, the nitrogen-bearing deposit nature placed there as the best fertilizer known to man.

Last, there are 2,000,000 acres of river bottom land possessing the same general and valuable characteristics of river bottom land in other states.

All must be drained, some lands by gravity, others by low lift pumping.

Thereafter a mild climate, which brings no snows and ice to terminate growth and maturity or to interfere with continuous cultivation, and a soil that has repeatedly been declared richer in plant food than is the Valley of the Nile, which rents at \$75 an acre a year, and sells at \$1,000 an acre, may be turned to maximum account in increasing the national food supply and in decreasing the cost of living, the navigable drainage canals greatly aiding the farmer in solving his transportation problems and the refrigerator fast freight service supplied by the railroads bringing the early as well as the late season food crops into the closest possible touch with the consuming markets of the north.

Thus far about 300,000 acres of these Louisiana low lands have been reclaimed and are now under intensive cultivation, and the profits therefrom are attracting homeseekers from all parts of the country in such numbers that each reclaimed area is settled up just as soon as the surplus rainfall is removed.

Near Lockport, on Bayou Lafourche, a Michigan farmer this season has made a crop of sugar cane averaging 50 tons to the acre on land which three or four years ago had been continuously saturated with undrained rainfall during many centuries. That man's name is A. V. Smith, and he hails from Marshall, Michigan. He will sell his cane crop at \$4 and more per ton to a nearby sugar mill. Mr. Smith was a pioneer on the reclaimed lands of Louisiana. I am told he was a poor man when he arrived four years ago, and that he is now worth more than \$100,000. Many others have followed in the footsteps of this man, this farmer, who through agriculture and foresight alone has become a prince among farmers in a new land.

Louisiana is reclaiming her low lands without federal aid, not because federal aid is not desired, but because it has not been available.

In order to make the way of the reclamer easy and in order to

promote rapid development and to attract the right sort of home-seekers, the people of Louisiana, by constitutional amendment, have perpetually exempted all money invested in land development in the shape of mortgage loans from all forms of taxation; have authorized the creation of drainage districts, and, under close state supervision, the issuance and sale of drainage bonds for the liquidation of which the state collects and disburses an annual acreage tax on improved land; and they have authorized the levying of an annual tax on all property in the state for the purpose of building modern highways.

Under this latter law the city of New Orleans annually contributes many thousands of dollars for the building of modern highways outside the city limits.

Louisiana does not, and will not, ask the federal government to reclaim her 9,000,000 acres of now undrained lands. Her citizens, aided by wise, farsighted laws, and by the sale of safe investment drainage bonds will carry on and complete this enormous undertaking.

But Louisiana does ask, and will continue to ask, that the federal government with its splendid engineering and scientific equipment, and with the means at its disposal, survey Louisiana's streams, plat her lands, encourage her development, and supply outfalls for the drainage of the states northward which will not prove inadequate when the flow from Louisiana's drainage pumps shall reach maximum volume as the area brought under drainage increases.

The federal authority has watered the arid lands of the West, and the act has been approved.

It has cleaned up Havana and put an end to the importation of disease therefrom.

It has voided states' rights and applied the strong arm of the nation in the shape of the Public Health and Marine Hospital Department to the safe-guarding of the country against disease that might be brought in through the Gulf coast ports.

It has invaded foreign countries when the interests of its citizens have been at stake and it has done much for the health conditions of the Central American ports—all in aid of citizens of the United States.

There was logic, common sense and practical economy behind these acts.

There is even more logic, more common sense and greater practical economy behind the request you will make of the federal Congress to render direct and expansive aid in draining our 70,000,000 acres of fertile low lands.

And I desire to suggest that when you make that request you ask the government to ignore state lines, to forget the ancient and oft-times abused principle of states' rights—that you urge the government to adopt a broad policy that will enable and instruct its officials to aid and assist in freeing the lowlands of excess moisture wherever such lands lie and whenever the nation's engineers declare such projects feasible.

The adoption of a broad policy of this character will, I am sure, effect the drainage of the entire 70,000,000 acres, since there is not a single acre of the whole that presents one-tenth the difficulty presented by the irrigation projects in the West. (Applause.)

During the delivery of Mr. Leake's address, the time limit of 20 minutes allowed each speaker having expired, on motion of Mr. M. O. Leighton, of Washington, D. C., an extension of time was unanimously granted Mr. Leake for the completion of his address.

MR. TOM RICHARDSON, of Oregon: Discussion is now open on these three papers, according to the program?

PRESIDENT FOWLER: Discussion is on according to the program, yes.

MR. RICHARDSON: Then I have the floor?

PRESIDENT FOWLER: If you will defer for a moment—

MR. RICHARDSON: Certainly.

PRESIDENT FOWLER: I would like to read something that has been put into my hands relating to this same subject. First is a resolution that will be referred to the Committee on Resolutions without debate.

President Fowler then read a resolution endorsing the movement to organize a National Drainage Reclamation Association, and also a resolution endorsing and recommending the speedy passage of the federal bill for the establishment of a drainage fund and the construction of works for the reclamation of swamp and overflowed lands.

PRESIDENT FOWLER: While I am reading that I will read another that has been put in my hands as president of the Congress:

"Sir: Pursuant to the suggestion in your opening address delivered December 5th, and largely using your language, there is issued a call to those interested in the reclamation of swamp and overflow lands, that an association may be formed to work in harmony with the National Irrigation Congress and with its support and advance the interests of reclamation of such swamp and overflow lands. You are respectfully requested to read to the Nineteenth National Irrigation Congress, and especially are the officers of the Nineteenth National Irrigation Congress invited to be present at the meeting place specified in this call.

Respectfully,

(Signed.)

"EDMUND T. PERKINS, President,
American Reclamation Federation."

CALL FOR RECLAMATION OF SWAMP LANDS

"A call to those interested in the reclamation of swamp and overflow lands.

"Time and again has the National Irrigation Congress, by resolution, called the attention of the Federal Government to the imperative need of action in the matter of reclamation of swamp and overflowed lands, a matter which vitally concerns the health and wealth of the nation, but the chief interest of the National Irrigation Congress is the reclamation of waste lands by irrigation, and it is deemed necessary to organize a separate association to promote the reclamation of lands by drainage;

"Therefore, by the authority vested in me by the American Reclamation Federation, I hereby invite all those interested in the reclamation of swamp and overflowed lands to be present at the Hotel La Salle, in the College Room, Thursday evening, December 7th, at 8 o'clock, that such association for this purpose may there be organized.

(Signed.)

EDMUND T. PERKINS, President."

The two resolutions having been read to the Congress, are referred to the Committee on Resolutions. The letter and the call are a notice to this Congress that such a meeting will be held, and anyone who is interested in the subject of drainage is invited and desired to be present.

MR. TOM RICHARDSON, of Oregon: I was a native of the Mississippi Valley and lived for a time in Mr. Leake's city, New Orleans, and am heartily in sympathy with all that has been said in his paper.

I now reside in Oregon. Oregon has paid 13 per cent of the entire reclamation fund and Oregon has received in return 4.2 per cent.

In other words, it seems to me to a certain degree that we have been the goat of the reclamation proposition.

All that has been suggested by the gentlemen here relative to the reclamation of the swamp lands of the country, we in Oregon agree to. We believe it ought to be done, we know it ought to be done. Those of us that are connected with the building of cities and communities realize that the people are moving to town everywhere, they are coming into the cities. Everything ought to be done that is possible to increase the agricultural production of the United States.

But, I want to say to this convention that the most pertinent and the most intense and the best talk, and the one that I have heard that meant the most to me for a long time, was in Cleveland the other night. One of the speakers at the reception given to the western governors on their tour of the East said that if he was a governor he would capitalize agriculture throughout the United States as is done in Germany. I want to say this, that we in the Northwest favor this move, we favor the idea of reclamation, taking it all in, but we do not believe that plutocratic Illinois, rich and fertile Illinois and opulent Pennsylvania and Ohio will want to take from the new State of Oregon the money that she has paid into this reclamation fund, because she has great problems and great projects that are equal to any; and I do hope that the Committee on Resolutions—while I am not going to offer a special resolution, but the member on resolutions from my state will—that we will at least get some justice in the distribution of the reclamation fund of the United States.

Think of our being in a new state with less than 700,000 people, paying into the reclamation fund 13 per cent of the total and getting back only 4.2 per cent. I want my friend, George Maxwell, the great orator of irrigation for such a long series of years, in his address representing that marvelous city of Pittsburgh, where they turn out millionaires like sausages, to speak something about what he thinks we ought to have.

I am not going to take more of your time. These have been educational addresses; they have been the finest kind, but I do not believe that Judge Fletcher or Mr. Leake or Mr. Maxwell, or any of the residents of this great city of Chicago, would like to take the money from a new and prosperous state. We are not hungry out there, nor we do not need the money, but we feel that we ought to have justice from the Irrigation Congress and justice from those gentlemen in the older states.

MR. EDMUND T. PERKINS, of Illinois: Mr. President, with your kind permission, I will call attention to the text of the bill which these resolutions seem to favor. I fully appreciate Mr. Richardson's position and I will assure him that it is not the expectation or the hope of anyone in the East that any funds will be diverted from the West.

The bill reads that "All moneys received from the sale and the disposal of public lands in the states of Alabama, Arkansas, Florida, Illinois, Indiana, Iowa, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Ohio, and Wisconsin shall be used in this work," and not a penny shall come from the wonderful West. (Applause.)

PRESIDENT FOWLER: Is there any further discussion desired by any delegate to the Congress? If not, the Secretary will read a resolution which will be referred to the Committee on Resolutions without debate.

MR. JOHN FAIRWEATHER, of California: Mr. President, I have been somewhat surprised at my neighbor on the left from Oregon claiming they only had 4 per cent. We in California joined with

them in the Klamath project and we expected in California that California would get some benefit from that great appropriation, but we find as the years have gone by that California is left out in the cold and that of all of the money that has been diverted by the government into the reclamation fund, California has had but half a million dollars spent for her benefit; and of the present reclamation funds we will not get anything unless we stir ourselves up and put in a little more politics and get behind some of our Congressmen and insist that we get our rights.

We have been a little too timid, we have been a little too nervous in these congresses in the past in asking for what we should have from the government of the United States, and I am going to introduce a resolution this afternoon that will ask Congress to be more liberal with the Department of the Secretary of Agriculture in this country. I notice that our Secretary of the Navy is going to ask for thirty million dollars to increase the measures for war and to kill people. My God! What are we coming to in a day of peace when we are talking of arbitration treaties and peace? Of the total of six hundred and sixty million dollars which the government collects annually from the people of this country, 70 per cent is spent to-day in paying for past and future wars. The Agricultural Department of this country, which is looked upon as the greatest in the world, is only given an appropriation by Congress of seventeen million dollars, and now the Secretary of the Navy is asking for twelve million dollars to put into a war vessel which will rust and rot out in seven or eight years. It is time that we woke up, and I tell you we are going to do it in California.

MR. J. M. DEVINE, of North Dakota: If you can spare the time, Mr. President, I would like to say a few words in connection with this subject.

I have listened to the papers read this morning with the greatest possible interest. Having recently arrived, I have looked over this gathering of the representative men from the different states and yet I have been wondering if this country yet realizes the tremendous importance to the whole country, not to any one state but to the whole country, of what reclamation means to it as a country?

I want to say to you now that the man who has made an arid country blossom as a rose, who has offered new acres to the home-seekers of this country, that system which has enabled not the rainfall but the conserved water to sweep over burning sands and put it into the power of the people to seek homes, that law or that people or that man which has accomplished that, has accomplished at the same time something which is the greatest thing that is now opening up this country. We are increasing at the rate of twenty millions every ten years. Where are the people going? We must absolutely own our own homes. The congested cities are the dangerous portions of this country to-day. We must have homes to bring the people to.

Listening to the Judge from Louisiana, I want to say that whatever is good for Louisiana, on a general proposition, is good for North Dakota, because we live in the same country and under the same conditions. (Applause.) For that reason I hope whatever you do to-day, you will do that which will build largely for all this country in opening and making fertile the land that has too much water, as well as opening to cultivation the land which has no water at all. Therefore, whatever the government can do for Louisiana or for North Dakota, we favor; whatever the government can do for California or Colorado, we from North Dakota favor. It is a big problem, far-reaching and means much to the oncoming millions in this country, and we stand for it wherever it will open up a single foot of new land, and give a home to the oncoming millions of the future. (Applause.)

MR. W. H. REDWAY, of Idaho: I want to say to this convention and especially to the gentlemen from the East, that Idaho and the West are not asking any money from you, but we are merely asking you as a boy would ask his father to make him a small loan, with good security, and we will pay you back every dollar that has been borrowed. What more can you ask? (Applause.)

PRESIDENT FOWLER: The time having expired for discussion, the Secretary will now read some resolutions that he has, and I believe also a telegram.

SECRETARY HOOKER: I have a telegram from the Pueblo Star-Journal, Pueblo, Colorado, addressed to Hon. B. A. Fowler, President Nineteenth National Irrigation Congress, reading as follows:

"People of Pueblo and Colorado through the Star-Journal extend congratulations on auspicious opening Nineteenth National Irrigation Congress. Predict great benefit throughout the East as result of sessions and hope that splendid records and achievements of Pueblo Congress may even be eclipsed in Chicago." (Applause.)

Secretary Hooker then read a resolution endorsing a permanent Agricultural Exposition in Chicago.

PRESIDENT FOWLER: Under the rules the resolution will be referred to the Committee on Resolutions without debate.

Secretary Hooker then read a resolution presented by William E. Smythe of California, urging the creation of a Bureau of Little Farms to organize settlements upon vacant land.

PRESIDENT FOWLER: Referred to the Committee on Resolutions without debate.

The chair has an apology to offer to the Congress for neglecting more or less of his duties, and among them he should have yesterday invited to the platform the past presidents of the Congress, and also the vice-presidents of the Congress. It is never too late to do a good thing, and he now gives notice, requesting the past presidents and vice-presidents of the Congress to make themselves at home upon the platform and back up the President in the work which devolves upon him. (Applause.)

The past presidents and vice-presidents having come to the platform and seated themselves, President Fowler continued as follows:

PRESIDENT FOWLER: We shall next have the great pleasure of listening to an address entitled "One and Indivisible: Forestry, Irrigation, Drainage, Navigation. The Rivers are the Greatest Asset of the Nation when Regulated for all Beneficial Uses," by one whom I have no need to introduce to you, but simply to present to you, our friend of many years who has worked as few men have ever worked for the passage of the National Irrigation Act and for the carrying on of the great work of national irrigation throughout the country. George H. Maxwell, Executive Director of the Pittsburgh Flood Commission, and he wants to come right up on the platform. (Applause.)

Address by

George H. Maxwell

Executive Director, Flood Commission of Pittsburgh

ONE AND INDIVISIBLE: FORESTRY, IRRIGATION, DRAINAGE, NAVIGATION. THE RIVERS ARE THE GREATEST ASSET OF THE NATION WHEN REGULATED FOR ALL BENEFICIAL USES

Mr. President and Delegates, Ladies and Gentlemen of the Convention:

As I stand here and look into your faces I see between you and me the pictures of other Irrigation Congresses that have gone before, and of events that occurred in those congresses that have brought so much to the people of the United States without regard to section, that it has been my hope that in this Irrigation Congress we might again turn our faces to the rising sun, and start a new movement, broader possibly than putting water upon the arid lands of the West, but which in my judgment is the only possible solution of the great problem of the reclamation of the more than seventy million acres of arid lands that are still unreclaimed.

There are few here to-day who realize how far back this movement for the reclamation of the arid public domain extends. I question very much whether my good friends from the lower Mississippi Valley who are now organizing a National Drainage Movement would be willing to wander in the wilderness as long as we of the West wandered, before at last we came within sight of the Promised Land.

You must not forget that the National Irrigation Congress was organized twenty years ago and that its first session was held on the 15th day of December, 1891; and it is a thing that we should give thanks for, that the man who organized that congress, its founder, is here to-day and sitting upon this platform. (Applause.) I refer to my old and good friend and co-worker, Mr. William E. Smythe. (Renewed applause.)

I was not one of the pioneers in the movement for the reclamation of the arid public lands of the West by the National Government. I understand that that movement was first projected into a National Irrigation Congress at its Los Angeles session, and afterwards by the then Governor of New Mexico, Hon. Lionel A. Sheldon, at Albuquerque, in 1895. Governor Sheldon is still living and a resident of Pasadena, California. To Los Angeles must be given the honor of having been the birthplace of the National Irrigation Movement.

My first connection with or attendance upon a session of the National Irrigation Congress was at Phoenix, Arizona, in December, 1896. In other words, in ten days more it will have been fifteen years since I first had the pleasure of meeting with the members of this organization. The question of who initiated the National Irrigation Movement, the organized propaganda that resulted in the passage of the National Irrigation Act, has been suggested here to-day, and I want to tell you who initiated it.

After the Albuquerque Irrigation Congress, of 1895, the National Irrigation Movement was taken up by the press and the Chamber of Commerce of the city of Los Angeles and they sent a strong and active delegation to the Phoenix National Irrigation Congress in 1896. I there first met Mr. Charles B. Boothe, who was elected president of the Phoenix Congress, and again elected president of the Congress that met at Lincoln in the following year. The impetus

and the initiative then given to the National Irrigation Movement by Mr. Boothe and the members of the Los Angeles delegation representing the commercial interests of that great city through its Chamber of Commerce then and there initiated the National Irrigation Movement. The result was the passage of the National Irrigation Act in June, 1902. (Applause.)

It is one of the proud moments of my life to be able to stand here to-day as a member, and as a representative in this organization of the Los Angeles Chamber of Commerce, who started the National Irrigation Movement, away back fifteen years ago, and did it without any thought of sectional advantage, but for the benefit of the whole West. (Renewed applause.)

It may be that these reminiscences do not interest you, but they have a very strong bearing upon the great problems that face us in the future. We were told last evening, if I am not mistaken, that under the National Irrigation Act something over a million acres has been reclaimed, and about ten million acre-feet of storage capacity constructed. All the money originally provided by that Act has been expended—mark that—and twenty million dollars has been advanced to the fund by the action of the last Congress, which is now being expended—mark that—and when that money is all gone, I believe the West will have reached a point where this generation will see comparatively little more done under the National Irrigation Act in a large way to advance the great cause of irrigation in the West, unless we reach out and grasp the opportunity which is now at our hands to seize upon a larger and broader policy, which was the original policy of the National Irrigation Movement, and apply it not only to the West but to the entire nation.

In other words, my good friends, I have come here to-day to give to you this larger vision that has come to me, as a western man, as a citizen of California, because I am still a citizen of California. I have been absent on foreign service a good many years, but I pray that the time will come when that service will end and I can return to the home of my boyhood and pass my declining years in the state that I love so much. (Applause.)

When we first started with this great National Irrigation Movement, what was it that we asked of the people of this country? We did not ask for a law under which the government would put its finger upon specific land and say: that land must repay the cost of building these great irrigation works. The very first shot out of the gun at the National Irrigation Congress in Phoenix fifteen years ago, in December, 1896, was a resolution calling upon the National Congress to appropriate money for the building of reservoirs.

A year later we took as the text book and the Bible of our movement what was known as the Chittenden Report. That report was issued in December, 1897. It was made under a clause in the River and Harbor bill providing for an examination of reservoir sites in the West, with a view to establishing the question of whether or not they were practicable and desirable for three things: First, Improving the navigation of navigable rivers; second, providing water for the irrigation of the arid lands; and third, preventing destructive floods. That appropriation was made in the River and Harbor bill, and I am going to stop long enough to look it up and give you the exact date. June 3, 1896, was the date of the passage of the River and Harbor bill containing that provision.

Under that appropriation Captain Chittenden, who has since been advanced to the rank of Brigadier General, made a most exhaustive report on this great and nation-wide idea of reservoirs on the head waters of navigable streams to regulate the flow of the rivers, holding back the water that would otherwise go to waste in time of floods, and turning it into the stream at the low water season when

it was needed both for navigation and irrigation. We took that book and went before the people of the Nation asking for that policy and its adoption by Congress.

We fought from one end of this country to the other, and organized a national force. We were strong in the Senate. The West, with its fifteen states had thirty senators, and year after year we got appropriations into the River and Harbor bill in the Senate to build reservoirs upon the head waters of the navigable rivers in the West. Every time we got those appropriations into the bill as an amendment in the Senate, they went out in the House. They went out in the Conference Committee because the West had only one-tenth of the whole population of the United States, and only one-tenth of the political power vested in the House of Representatives.

But it was not so very long before the force of our strength in the Senate made itself felt in a way that commanded the attention of the people who opposed our policy of the National Government aiding at least in the reclamation of the arid West. You all remember, no doubt, an event which is very clear in my memory, because I sat all night long in the gallery of the United States Senate watching it being done; you no doubt remember the time when Senator Carter of Montana talked the River and Harbor bill to death, and they did not get any River and Harbor bill, at that session, because the West had decided to show its teeth and satisfy the people of this country that it meant business. And, in the next session of Congress, those who had opposed our measures came to us and said, "For God's sake take an irrigation bill or any kind of a bill that will keep you off our River and Harbor bill," and we got our Irrigation bill, and we got it that way, by fighting for it, in season and out of season, and I do not believe we would ever have gotten it in any other way.

I feel, however, that it is right that I should say here and now that when the National Irrigation Act finally passed Congress in June, 1902, it was an absolutely non-partisan measure. It was a caucus measure of the Democratic Party in the House, and it is due to our friends in the lower Mississippi Valley that we should at this time say to them that if it had not been for their aid as members of that caucus and as friends and supporters of our National Irrigation Act, it never would have become a law. (Applause.)

I want at this time to especially express the obligation that the West is under to three members of the House of Representatives of that session; Mr. Ransdell of Louisiana, president of the National Rivers and Harbors Congress; Mr. Underwood of Alabama, who was on his feet at every emergency, and helped to fight our bill through on the eventful day of its passage; and Senator Newlands of Nevada who was then a member of the House of Representatives, and without whose diplomacy and tireless efforts and loyalty to the West we would never in the world have gotten that bill through the House of Representatives. (Renewed applause.)

Now, my time is up in just two minutes and I do not wish to have it extended at this session. I have presented to each of the delegates who are here present a copy of what is known as the Newlands River Regulation Bill.* If you will take that bill and read it carefully you will find it holds a complete, absolute and entire solution of the problem of drainage in the lower Mississippi Valley; of the problem of the regulation of the great rivers of the West so that the flow shall be standardized and the water be there in the summer time instead of going to waste in the winter on the great navigable streams and their tributaries; and that it brings to our support and aid the whole eastern half of the United States.

If the West and the South will rise to the opportunity we can

*The Newlands River Regulation Bill is included in the appendix to this volume.

pass that bill in the present session of Congress, and have fifty million dollars a year for ten years appropriated to carry through these great problems, which are four in number: First, the irrigation of the West; second, the drainage of the South; third, the protection of the whole country from floods; and, fourth, the establishment of waterways for commerce that will be something more than streaks of mud in the summer season when you want to float boats on them. (Applause.)

If, after you have read that bill, as I hope every member here to-day will read it, you are interested enough in it to give me more time to explain its details to you, I will be glad to have that opportunity. I want, among other things, to explain to these gentlemen from the lower Mississippi Valley why it is that they never in the world can establish a system of drainage in the lower Mississippi Valley that will not in the end fail as the levees of China have failed; that will not in the end fail as the canal systems of the Plains of Mesopotamia failed, unless we unite the whole United States in a great nation-wide movement to go back to the sources of the floods, and provide a national system for controlling the surplus flood waters that will send it down to the lower valleys in the summer time when they need it for navigation, instead of having it go down over them like a besom of destruction in seasons of floods when they are praying God to keep it off of them. (Applause.)

PRESIDENT FOWLER: I will ask Dr. McGee to read a telegram that was received this morning from Senator Newlands himself, and, if I remember rightly, it is upon this very point that Mr. Maxwell has been talking.

Dr. McGee read the following telegram:

TELEGRAM FROM SENATOR NEWLANDS

Washington, D. C. December 5, 1911.

B. A. Fowler,
President National Irrigation Congress,
Chicago.

I regret my inability because of the pressure of other public duties to attend the meetings of the National Irrigation Congress. No one realizes more deeply than myself the large influence which it has exerted in the past, and the good which it can do in the future. I am glad, therefore, to respond to your invitation to send you a message on a subject of the greatest importance in your deliberations. This subject is the co-ordination of the hitherto somewhat scattered efforts at river improvement and control into a united effort under comprehensive plans. No branch of the conservation and utilization of our natural resources seems to me more important, yet none requires to be approached in so broad a spirit. If we are to get away from our superannuated methods of piecemeal legislation regarding our rivers, we must have a strong public sentiment behind the demand for adequate legislation providing for scientifically co-ordinated work. I would have the various scientific forces of the government, such as the Reclamation and Forest Services and the Geological Survey, co-operate with Engineer Corps of Army in plans and works. I would also have the nation co-operate with the states in devising and carrying out comprehensive plans for the regulation of river flow with a view to the promotion not only of navigation, but to develop our rivers for every useful purpose which may contribute to navigation directly or indirectly; such as the reclamation of arid lands on the headwaters, of swamp lands on the lower stretches, of water power wherever found, and the construction of terminal and transfer facilities to bring boat and rail together in inland transportation. Our rivers must be developed for every useful purpose to which civiliza-

tion can put them. While this is a matter upon which I believe there is a substantial agreement, yet, the pressure of public opinion has not made itself sufficiently felt by Congress. I should be glad to see the National Irrigation Congress express itself emphatically upon this subject and lend its great influence to the effort to bring about an internal development, of which our children's children will proudly declare "There were giants in those days."

(Signed) FRANCIS G. NEWLANDS.

PRESIDENT FOWLER: The last speaker, Mr. Maxwell, has been closely associated with Senator Newlands in the work of preparing this bill. In a sense the Chair would consider him to that extent the representative of Senator Newlands in this Congress, and Senator Newlands has assured us that he cannot be here himself. I do not mean to imply that Mr. Maxwell is authorized to speak for Senator Newlands, but to the extent that Senator Newlands appears upon the program at 9:30 o'clock to-morrow morning on the subject of "Irrigation and Prosperity," the Chair feels that it is very proper that the time allotted to Senator Newlands should be given to Mr. Maxwell, if he so desires. (Applause.)

I have no doubt at all that the Program Committee, who have this matter in charge, will readily agree to the suggestion that I have made, and I am satisfied from the faces of the audience and the applause to the suggestion just made, that this is sufficient indication of the desire of the delegation. Therefore, I will announce that the first address of the morning, Thursday morning at 9:30 o'clock, will be by Mr. George H. Maxwell, continuing the subject that he has taken up to-day, and in the meantime he suggests that the delegates familiarize themselves with this great big bill, an all-embracing bill, a bill that is national in every sense of the word. And so I add to his request my own, that the delegates familiarize themselves with this bill to the largest extent possible between now and to-morrow morning, for that will certainly intensify the interest that will be taken by the delegates, and also will prepare the delegates themselves to take part in the discussion which will probably come after Mr. Maxwell's speech.

The next address is by James A. Frear, Secretary of State for Wisconsin.

Address by

James A. Frear

Secretary of State of Wisconsin

I hesitate to participate on short notice, in a program which is sure to be replete with carefully prepared addresses. However, there is a topic that may be offered for brief consideration, in order to invite discussion, rather than to attempt any careful exposition of the subject.

As a people we are deeply interested in conserving resources and in promoting home-making, and this organization has given the movement a powerful impetus.

The conservation of natural resources finds its complement in the conservation of all resources, and every community, whether it be the humblest village, a great Chicago, or a sovereign state, jealously guards its own.

It conserves its people by comprehensive health regulations, school facilities, public parks, and in innumerable other ways. In its efforts to protect its citizens it punishes the gambler, the street swindler, and the highwayman for pursuing his vocation.

Thus every community in some degree joins with this organization in promoting home-making efforts. But in a larger field than

that occupied by men who forcibly separate the private individual from his money, we find shrewd experts in their profession, who are given license to prey upon the credulity of human nature by all manner of questionable ventures, from the giving away of sand lots in Michigan to distant farm land homes, reserving a handsome profit to the promoter in every instance.

Without questioning legitimate business methods, every kind of land speculation that can be devised by ingenious minds, masquerades to-day under the alluring invitation of "back to the land."

Business men close their eyes to palpable frauds.

Oftentimes the powerful press has its lips locked by advertising contracts, while honest business suffers when placed in competition with these get-rich-quick schemes.

The most tempting fruit is that just beyond reach and beyond close examination, and the greater the prospective profits of some distant land venture, the greater the desire to possess.

To be more specific: Our national government opens up a reservation, offering prizes to the lucky winners and thousands of people plunge into the lottery, each expending many dollars of hard earned money in striving to grasp a handful of desirable claims—not for the purpose of becoming bona fide settlers, but to win a prize in the gamble.

It is a matter of common knowledge that the waste of money, energy, and the disappointment that once fell to the lot of unlucky investors in the Louisiana lottery is regularly duplicated at public land drawings.

Then there is the alluring irrigation proposition advertised throughout the country by a plow share turning over furrows of golden coin, with the result that hundreds of people are rushed into the new section months and sometimes years before water can be furnished for growing the promised crops.

Untrained thousands of clerks and laborers in our cities are persuaded to invest in fruit, pecan, or kindred propositions, thousands of miles distant, without examination, whereas a very slight percentage reap the fabulous returns promised by gaudily illustrated misleading literature, and many investors never get their money back.

Our Canadian neighbors, at an annual expense of several hundred thousand dollars spent in missionary work, will secure from the States next year, according to their own estimates, nearly a quarter of a million settlers, each one carrying over the border line one thousand dollars, on an average, in money or property.

This exodus means an economic loss to the States of nearly a quarter of a billion of dollars annually, aside from the intangible value attached to every industrious settler of the community.

To those who are seduced from a comfortable livelihood through the attractive expectation of getting something for nothing, the outcome too often is one of disappointment, loss of money, time, and energy, while the waste, in the aggregate, becomes enormous.

In Wisconsin, Minnesota, Michigan, or Illinois, for example, the loss to the individual state of \$5,000,000 by fire or other disaster, over and above insurance, would startle its citizens beyond measure and be given publicity by the press of the country. If such financial loss was accompanied by 5,000, or even 500, deaths in each state, the whole country would become deeply concerned. But the removal of 500 or 5,000 settlers from each of these states, and from other states, to Canada, in making up its complement of the 200,000 and more, who are annually persuaded to leave, with the accompanying enormous loss, becomes a matter of slight public concern because the loss is silent and gradual as the waste that has come to our forests, although none the less serious in its consequences.

We rejoice in the prosperity of our northern neighbors, but are not willing to accept such losses unquestioningly, and the inquiry

arises, what arguments can be legitimately advanced to prevent such emigration from the States? The answer is—a better understanding of the comparative advantages of soil, water, climate, and last but not least, of markets, not to be ascertained from aggressive advertising agents or attractive literature, but by some simple, concrete method of comparison. Such opportunity is invited by the States.

We may conserve our public forests and other natural resources, but in our home-making endeavors we cannot inaugurate a successful "back to the farm" movement by trying to persuade men to remove from the cities and become agriculturists, while capable, intelligent farmers, deceived by glittering promises, stream away from our own lands to distant Eldorados.

The cities will continue to grow in population, outstripping the agricultural districts to the deep concern of statesmen and economists, but we will not stem the current by crying "back to the farm" when our government and other governments turn the spindle wheel of reservation prizes or other lotteries, or flood our states with glittering inducements in an effort to persuade our own people to give up their present homes for an uncertainty.

We are not conserving our resources or encouraging home building as a people when the clerk in the counting-house and the maid at the ribbon counter invest their savings in speculative land propositions without investigation. Neither can we effectually conserve our resources or build homes on the farms when an annual drain of a quarter of a billion dollars goes across the border with an annual loss of an army of industrious settlers larger by far than the legions of Napoleon, many of whom afterward return, broken in spirit, health, and purse, like unto the Old Guard's retreat from Moscow.

The waste of peace is universal and oftentimes greater than that of war, and as serious in character to present and future generations as are the denuded slopes of the Appalachian range.

I am not advising what methods should be pursued to protect gullible and credulous people from sand lot advertising or gilded gold bricks, but I do believe that with the help of the public press many of these get-rich-quick schemes, whether promoted by governments or private interests, can be prevented.

A more practicable distribution of public lands without interfering with the homestead principle is successfully pursued by several states to-day.

Reputable land agencies could be assured by government or state licenses, the same as notary public licenses, secured by bond for faithful performance of duties.

A right of recovery against agents or principals for warranty of conditions, to be collected as for a defective horse or objectionable land title.

I am not advocating stringent remedies, but suggesting that they are to be found if necessary. Neither am I questioning proper business methods, which need no defense.

Years ago the government barred from the mails newspapers that exploited the Louisiana lottery. The power to exercise some degree of censorship over more glaring frauds lies in the hands of the same authority to-day.

Why not require land advertisers to present meritorious propositions with money when purchasing space, or require an impartial investigation of glittering apple, peach, pecan, or other home-making propositions, based upon the same notions of public policy which govern our examinations of bucket shops or opium joints?

The pipe dreams in our country are not all of Chinese origin, nor is one dollar lost at prohibited card games where hundreds are frittered away and wasted because of extravagantly worded "back to the land" literature.

Legitimate business interests will invite any reasonable scrutiny without fear of consequences, but visionary land schemes that have reached unprecedented proportions should be prohibited or reduced to a minimum.

While we are doing a highly commendable service for future generations in conserving our forests and coal, is it not desirable to conserve our own people of the present period and our resources represented by their belongings?

Is there not a legitimate field of effort afforded the conservation movement looking toward the protection of people and property?

This brief presentation of the question is offered with a firm belief that in a measure both can be protected if the powerful agency of the press, with reasonable legislation, can be secured to aid such work.

All the gambling contrivances in Chicago since the founding of Fort Dearborn, it is safe to say, have not produced the actual waste that results to thousands of victims who, with equal confidence, purchase Masonic Temples, Michigan sand lots, or distant fruit and farming lands from enterprising curb stone real estate brokers, whether backed by governmental authority or private interests.

I have briefly suggested a condition of present waste, second only in importance to the conservation of natural resources. It directly concerns the subject of home making, a purpose set forth in your terms of organization, and as such is offered for consideration. (Applause.)

MR. TOM RICHARDSON, of Oregon: I would like to have Mr. Frear tell us where he got his information with respect to people going into Canada.

MR. FREAR: That is a very proper request. I was at the Coliseum Building speaking on a similar occasion the other evening. That information comes from Emigration Commissioner Walker of Canada, and it was printed in the Chicago Tribune, taken from the Canadian Monthly, a week ago Sunday, in which Mr. Walker says 93,000 people have gone from the States to Canada within the last three months, and that they anticipate 200,000 more. Elliott Flower said up in Canada, from the best authority available, they claim 250,000 people would go to Canada within the next year, and they carry approximately \$1,000 each, and that is the class of people that the Canadian Emigration Department are seeking.

MR. RICHARDSON: I have been over Canada a great deal, holding meetings in the different communities of Canada, and I do not believe as many people have gone from the United States into Canada in the last two years as have gone from the central and eastern states to California and Oregon alone. Their towns are not growing like ours, even in the East.

I think that is a place where they work a great many American newspapers and American conventions, because I have heard this same speech, that is, these same thoughts, twenty-five or thirty times; and I believe that the National Irrigation Congress and the other organizations of the United States are making a mistake by advertising Canada and the vast number of people that are going there. (Applause.)

I want to say further that what this gentleman has said has been iterated and reiterated in the settlement of the United States from the time they first commenced moving from New York and Pennsylvania out into this wilderness of Illinois and Wisconsin, and there was that same fear that people were going to be taken advantage of. We are all opposed to it, and the governor of my state made a speech in regard to the character of sand-lot advertising, but God knows

there has never been as much of it anywhere on earth as in these states of Wisconsin and Illinois.

Thank God, we are a whole lot better and a whole lot cleaner, and some time during this convention I would like to have fifteen minutes to tell of the ideal propositions that are put up out West where men cannot buy until they know they can pay for their stuff. There never has been as high a standard in settling any portion of the world as there is existing now in the western part of the United States.

The gentleman's remarks cannot help but be taken as a slam against the West. You hear it in the editorial columns of the eastern papers, but I want to tell you that there is not a man connected with the Irrigation Congress from any of the western states who does not know and understand that the situation there is better and cleaner than it has ever been anywhere else, and that there are better opportunities and a better chance to investigate just exactly what people offer you in the West than has ever been offered you in Iowa, Illinois, Kansas, and all this great middle section of the United States.

Gentlemen, the West invites and the Pacific Coast invites that character of investigation that will lead you people to work through your bankers and find out, and to-day, when you take the matter put out by the commercial organizations of the West you will find that it is getting better and better all the time, and getting higher all the time. We want to be conservative, and we are so intensely conservative, compared with Canada, that there is no comparison.

PRESIDENT FOWLER: Mr. Frear desires just a moment to speak to this subject.

MR. FREAR: I do not intend to answer the gentleman even as to his insinuation against Wisconsin, which to-day is the greatest dairy state in the world, and which we think is equaled by no other state. (Applause.) I will only say this, that Oregon is a great and promising state, and the gentleman entirely misinterpreted my remarks if he thought that they were a suggestion against his state or the other state, because that was not my idea at all. My remarks were addressed only against the character of advertising put out to-day, not by legitimate propositions but by just the opposite kind. No legitimate proposition need be afraid of investigation. That is the only point I attempted to make. (Applause.)

Now just one suggestion in closing; I am willing to adopt Canadian Commissioner Walker's statement that 93,000 men with \$1,000 each went from these states in the last three months, as compared with the general statement of the gentleman who unfortunately has not discovered the facts as found by Mr. Walker.

MR. H. L. MOODY, of Washington: I want to say that I agree with very much of what the gentleman has said from the platform, but I do want to raise my voice in protest against the idea that the American farmer has not the right to go to Canada if he wants to.

I do not own an acre of Canadian land; I never owned an acre of Canadian land. I never offered to sell an acre of Canadian land, but if our farmers, as many farmers from the State of Washington have done, have gone over there and made fortunes by going there, I say that that is their right and their privilege. We have gone abroad and brought back the best blood of Europe and transplanted it to the farms of the United States. We are sending to-day to Europe for the best blood of Europe to transplant it upon American farms. I say, therefore, in the settlement of the broad matters of human life and prosperity that we all have a right to enjoy that privilege.

Again, when it comes to a question of advertising, I will challenge any country on earth to put up the high-class character of advertising that is being put out by the irrigation states of the Northwest. I have belonged to committees for years that have been putting out

that advertising. I challenge any man to find one word that has ever been put out from the City of Spokane that was not true in its entirety. (Applause.)

When you come to the sand-lot scheme, when you come to the graft, why you come to Chicago or New York or some of the other big, eastern, rotten cities—

A DELEGATE: Give it to them, Moody. (Applause.)

MR. MOODY: That is where you come. You come to the place where they pay the poor man $3\frac{1}{2}$ per cent. interest on his deposits, and where they loan the money to us on gilt-edge security at 8 per cent. or 10 per cent. a year. Not very long ago, the savings banks of New York City reduced their rate to $3\frac{1}{2}$ per cent because they could not pay 4 per cent. I happened to be negotiating a loan with one of these savings banks at that time, and they promised it at 6 per cent. on the best security in the world, but just at that time they said rates were going up and they charged me 7 per cent. That is what you get in New York, and that is what you get in Chicago, and if you want to get a square deal, come out West, where the men will meet you face to face. (Applause.)

MR. J. B. CASE, of Kansas: If you want a square deal, gentlemen, come to Kansas. We have a law upon the statute books of Kansas that no man can sell any bonds or gold bricks without a license. And, the gentleman from Wisconsin—I would like to have him look at me—

MR. FREAR: We tried to pass that law up in Wisconsin last year, but did not succeed.

MR. CASE: I understand your law, but I think we have a law that I really should be very glad to call to the attention of the members in this Congress representing every state in this country. I think they should know about it. I thank you. (Applause.)

MR. S. A. HUGHES, of Missouri: My name is Hughes, from Missouri, where you have to be shown. (Laughter.) I will delay you but a moment, gentlemen of the convention, but in order to set the gentleman right as to the facts regarding the emigration of people from the United States to Canada, I wish to state that last year I made a trip into northwestern Canada for the express purpose of ascertaining the facts as to the number of people who had gone into that section from the United States, and I believe I obtained the facts. I can say to you as the result of that investigation, that 97,000 Americans went into the three provinces of Alberta, Saskatchewan, and Manitoba in 1910, and 200 farmers returned.

Now, Mr. Chairman, there is no way to stop the people from emigrating to another country. It has been since the beginning of time, and it is to-day every man's privilege to better his condition in life. We have no fear of Canada or any other country on the face of the globe. There has been during the past eight years the greatest movement of people to the South and to the Southwest ever known in the history of the world, and we have no fear of any other nation. (Applause.)

MR. R. H. KERN, of Texas: I would like to ask the gentleman from Wisconsin if his position is that everybody must stay in the State of Wisconsin that is there now?

PRESIDENT FOWLER: Information is called for, Mr. Frear.

MR. FREAR: That is a very fair question. I observe that you have not got the point, and I regret that I have not made it clear.

I have been in Oregon, I have been in many of these states, and I recognize that you have as good land there and as good a country as can be found anywhere. It is only from the misleading advertisements of people who go from our own state—and just a suggestion,

19 families have returned from Alberta in the last few weeks and settled in Ashland, that left Wisconsin for that country.

I am not criticising the fact that they go there; but only the methods used to get them there or to any other place, where they are unfair. But any legitimate proposition, why we cannot question it, and, as I said in the first place, there are no better lands anywhere than in these western states. I agree also fully that you cannot circumscribe a man's opportunities by geographical lines.

MR. MOODY: I just came from the Land Show, and a man there told me I could make two hundred dollars an acre on cranberries in Wisconsin. I hope that that is true. (Laughter.)

MR. FREAR: Unquestionably so; come up. (Renewed Laughter.)

MR. MOODY: I simply want to enter a protest against putting any brides on anybody to go where he pleases. I think the American farmer and citizen can be trusted without converting this great National Irrigation Congress into a nursery to take care of the people.

PRESIDENT FOWLER: The Chair will take this opportunity to say that we all recognize the fact that simple parliamentary rules must be insisted upon in any deliberative body; that having only one pair of ears it is difficult to hear more than one person at a time. Hereafter the Chair will request that only one person speak at a time, and if several desire to speak, the Chair shall assume the prerogative of signifying which one caught his eye first, and that one person will have the floor.

Another thing, it is neither courtesy nor is it economy of time to be talking across the floor. Delegates on the floor have selected a Chairman to act for them in the proceedings and in preserving order. We are all gentlemen here. It is an easy matter, only sometimes when we get a little interested we forget what is due to others, and you know it is a simple parliamentary principle that a delegate on the floor should at least address the Chair; even if he wants information from another delegate, it is his duty to address the Chair, address that delegate through the Chair.

Now, when we understand one another along that line, it is just as easy as A, B, C. So I know you will appreciate the importance of what I say when we think of what may happen here within the next day or two. The Chairman might be in a pretty tight place, and he depends upon you people on the floor to help him pull through. He has always been able to pull through so far, and he does not want to make a failure of this sort of work here in Chicago. (Applause.)

MR. J. D. ROONEY, of Florida: I think that our state has about as great an influx of homeseekers as any of the southern states. I am from Jacksonville, and each excursion we register from 1,500 to 4,500 homeseekers.

I heartily agree with the gentleman from Wisconsin. We do want a check placed on the character of advertising that is going out to induce these homeseekers to go into these various states. There are something like 40 land companies in the City of Chicago doing business in Florida. Read some of their advertisements, and then come down and go over the State of Florida with me. I represent one of the principal railroads in that state as its industrial representative. My business is to investigate these propositions. I say to you frankly that I have several of them held up, and I refused to give them my indorsement. (Applause.) Such magazines as the National, Hampton's, and others, I have caused to refuse their advertisements. I am in hearty accord with the gentleman, and I think it is no more than right that these questions should be brought out in our deliberations and that we do what we can to put a check upon it.

We want good farmers in Florida, but we do not want them dis-

satisfied. In all my communications that go out from my office, I always make the fact clear: "Come down and investigate; do not buy any land on paper."

Look at the Inter Ocean this morning where Secretary Wilson was accused of land frauds about the Everglades. Look what Congressman Clark is doing where there is to be an investigation. And yet I sat in the Coliseum Building yesterday and saw the pictures displayed in speaking of the Everglades and what the government was doing in the way of building those great canals, yet Congressman Clark says that more than 50,000 people have been duped by the repression of certain facts that he claims Secretary Wilson was in charge of, and this matter is to be investigated.

If we find fraud coming from our government in that way, what may we expect to come from so many of these land-grafting schemes and these land frauds?

We have got good land, plenty of good land down there. But first investigate; then, after you have investigated, come down there. We welcome you. The City of Jacksonville is the Chicago of the South, and the gateway to the great state of opportunities.

PRESIDENT FOWLER: The time having come for adjournment, will you be patient for just a moment? You will remember that yesterday the statement was made—and the rules, I believe, cover that point—that resolutions should be handed in before the close of Wednesday. To-day is Wednesday. I hope that all those who have resolutions which they desire to present to the Congress will keep this in mind.

Also notice was given yesterday that the delegations as soon as possible select, first, a speaker to represent the state at the call of the states to-morrow; second, select a state honorary vice-president of the Congress, then a member of the Executive Committee; and then one member each of the Committee on Credentials and the Committee on Permanent Organization and the Committee on Resolutions.

Those selections should have been made this morning and should have been handed in in writing to the Secretary. If they have been, my friends, you have done your duty. If they have not been in any case, you are at fault, and I hope you will attend to your duty just as soon as possible.

Further in this connection I will say that the temporary chairmen of these three committees will be announced at the opening of the session this afternoon, and by that time it is desired that all members of the committee should have been reported to the Secretary. Announcement will then be made of the meetings to be held by the different committees, so that they can begin their work some time this afternoon. Now will you co-operate with us, please, in that respect, and pass in those names in writing, giving the names of the men by filling out the cards that have been provided for you by the Secretary?

MR. R. H. FAXON, of Kansas: May I inquire, Mr. Chairman, as to what time to-morrow the call of states will be held?

PRESIDENT FOWLER: The call of states, as I remember it, is Thursday afternoon in Orchestra Hall.

One thing more: The time this morning having been so fully occupied, Professor Gardner S. Williams, of Michigan, who was to speak to us on "The Uses of the Great Lakes," very kindly consented to address the Congress this afternoon. After the appointment of the chairmen of the different committees and the reading of notices and telegrams that may have collected in the meantime, Professor Williams will address you.

SECRETARY HOOKER: In connection with the request for reports from the state delegations as to their representatives, I have

a card here to be filled out by the respective delegations. I have several cards from which the state is omitted. I will read the names and possibly such information can be given us. I will further read the names of the states from which reports have been received.

Secretary Hooker then read from the cards as announced by him.

SECRETARY HOOKER: We have a telegram from Walter L. Fisher, Secretary of the Interior.

Secretary Hooker here re-read the telegram from Secretary Fisher, which will be found in the proceedings of Tuesday evening session.

SECRETARY HOOKER: The acknowledgment of that communication has gone forward to Mr. Fisher from the President of the Congress, as follows:

TELEGRAM TO SECRETARY FISHER

"Your communication received with applause. The Irrigation Congress, by unanimous vote, expresses appreciation of your methods and work in behalf of reclamation and conservation."

PRESIDENT FOWLER: In order to avoid confusion, the Chair desires to say that the telegram from Secretary Fisher which was just read is the same telegram that was read last evening at Orchestra Hall, but there are so many here to-day who were not at the meeting last evening, that the Chair thought it wise to have it read again to-day. I speak of this to prevent any confusion.

The time has far passed for the adjournment, and we are required to vacate the hall at the present moment. I will simply give notice that the meeting this afternoon will be in Orchestra Hall.

A recess was here taken until 2:30 o'clock p. m.

FIFTH SESSION
WEDNESDAY, DECEMBER 6, 1911
2:30 o'clock P. M.
ORCHESTRA HALL

The fifth session of the Congress convened at 2:45 o'clock p. m., Wednesday afternoon, December 5, 1911, President Fowler presiding.

PRESIDENT FOWLER: I regret to say that it is far past the time for calling the Congress to order, and I owe the Congress an apology for this delay in the time of opening.

The first order of business on the program this afternoon is the appointment of the chairmen of the three standing committees—a temporary chairman for each as called for under the constitution.

The chairman of the Committee on Credentials is F. A. Turner, of Washington; the chairman of the Committee on Permanent Organization is J. B. Case, Abilene, Kansas; the chairman of the Committee on Resolutions is Judge George H. Hutton, of Los Angeles, California.

These committees, the Committee on Credentials and the Committee on Permanent Organization and Committee on Resolutions, will be called together to meet, each separately, this afternoon, when the chairmen of these committees notify me that they are ready for the meeting; and I hope they will do so as soon as convenient. They also should notify me where they will have the committees meet if they have any wishes in respect to meeting places.

There are some announcements to be made by the Secretary. Also I desire to remind the state delegations that if they have not reported to the Secretary their selections for the different positions to which their attention was called this morning, that they have still another opportunity. The Secretary will make such announcements as he has now in his hands.

SECRETARY HOOKER: The following resolution has been presented by John Fairweather, of California:

The Secretary then read the resolution protesting against appropriations, reported as requested, for war purposes, and endorsing more liberal appropriations for the Department of Agriculture.

PRESIDENT FOWLER: That will go to the Committee on Resolutions without debate.

MR. ALBERT B. BARTLETT, of Wyoming: Mr. Chairman, I have a resolution here that I desire to present.

SECRETARY HOOKER: A resolution presented by Albert B. Bartlett, of Cheyenne, Wyoming:

The Secretary then read the resolution setting forth alleged causes of embarrassment to legitimate irrigation companies by the General Land office in connection with the Carey Act, and urging a change in the method of dealing with such companies.

PRESIDENT FOWLER: That will go to the Committee on Resolutions without debate.

JUDGE GEORGE H. HUTTON, of California: Mr. Chairman, my selection as chairman of the Committee on Resolutions came, as a friend of mine once said, so sudden that I am scarcely prepared to appoint either a time or place of meeting. I would like to inquire of the Chair if there are any available committee rooms that committee might be assigned to.

PRESIDENT FOWLER: Provision has been made for the convenience of the Committee on Resolutions at the LaSalle Hotel. Also there is a room here in this building off from the gallery that is abundantly large, and if it will serve the purpose of the Committee on Resolutions, it is at their service.

JUDGE HUTTON: Might I have an announcement then that the Committee on Resolutions will meet in the room in this building back of the gallery at 4:30 o'clock this afternoon.

PRESIDENT FOWLER: The Chairman of the Committee on Resolutions desires notice given that the members of the Committee on Resolutions are requested to meet in the room off from the gallery in this building at half past four this afternoon. The Chair assumes that each member of the Committee on Resolutions, as selected by his own state delegation, is aware of the fact that he has been selected and that he is a member of the committee. A little later on when we have some spare time I shall request the Secretary to read these appointments to the different committees, so that there may be no one overlooked.

The Secretary has another resolution that will be presented to the Congress.

SECRETARY HOOKER: A resolution from a delegate from Connecticut:

The Secretary then read the resolution setting forth the necessity for federal co-operation with other agencies in locating settlers on the land and calling attention to the need of information bureaus.

PRESIDENT FOWLER: This resolution will be referred to the Committee on Resolutions without debate.

The first paper this afternoon is the one that was passed this morning, entitled: "The Uses of the Great Lakes," by Prof. Gardner Williams, of Michigan.

Address by

Prof. Gardner S. Williams

Member American Society of Civil Engineers,
Ann Arbor, Michigan

THE USES OF THE GREAT LAKES

Mr. President, Ladies and Gentlemen: If the title of this paper or anything which it contains seems foreign to the purpose, I trust I may be forgiven, for the title was assigned to me, or at least a part of it, and I was asked to write upon the subject of evaporation from the Great Lakes. When I came to look the matter up, I realized that a paper upon that question alone would be entirely too technical to present to such an audience as I assumed I might have here, and under the authority of the committee I extended the title to "The Uses of the Great Lakes." But, the scope of this gathering has been extended to such a broad and wide degree that I feel that I may not have to offer great apologies for presenting what I have in view.

The most commonly thought of use to which the waters of the Great Lakes have thus far been put has been in the transportation of freight in ships. Since the days of the French Voyageurs, they have formed with their connecting waters a great highway of travel and commerce that early established the lines of foreign conquest, and later of national development. To aid commerce on the lakes more than twenty-five millions of dollars have been spent in deepening and improving channels in the Upper Lakes themselves and their connecting waters, not to mention the expenditures for lighthouses, beacons

and buoys, and the deepening of harbors. One of the earliest, if not the earliest, attempt to improve navigation was that of the State of Michigan to build a canal around the rapids at Sault Ste Marie, for which provisions were made in 1837, the first year of her statehood. Contracts were let and an effort made to start work, but the armed resistance of the United States troops at Fort Brady prevented procedure, and it was not until Congress in 1852, against the strenuous opposition of Henry Clay, authorized a grant of land in aid of the canal, that work was successfully begun. The canal was completed in 1855 and since that time has been once completely rebuilt, more than quadrupling its carrying capacity, and is now undergoing a further increase of about 75 per cent. Next in importance to the works at the "Soo" have been the channels constructed at the Lime Kilns and Ballard's Reef near the mouth of the Detroit River, and the St. Clair Flats Canal at the head of Lake St. Clair. Beside this a channel has been dredged about half way across Lake St. Clair, the St. Marys River has been deepened and its channels straightened and widened, and the outlet of Lake Huron enlarged.

While the purpose of these improvements has been to provide deeper channels for the passage of vessels, the work has frequently proven an example of robbing Peter to pay Paul, for as sure as a channel has been deepened the flow through it has been increased with the result that the waters above it have been lowered and frequently dredging has been necessary to maintain the former depths. The most striking instance of this is at the St. Mary's Falls Canal, where the improvements of the channels toward Lake Huron have so lowered the water at the locks that the possible draught of ships passing has already been reduced between one and two feet and the end is not yet.

Probably the most important change on the Lakes is that which has been produced on Lake Michigan as a result of the improvements in the Detroit and St. Clair Rivers and through Lake St. Clair, the effects of which have been variously attributed to deficient precipitation, excessive evaporation, the cutting off of forests and the Chicago Drainage Canal diversion.

Until 1888 the channels connecting the Great Lakes were in substantially a state of nature except for the St. Clair Flats Canal opened in 1874 through the delta of the St. Clair River, and the uncompleted Lime Kiln Channel near the mouth of the Detroit River which was begun in 1876 and the first cut, 300 feet wide opened through in 1888, the channel being finally completed in 1891. Simultaneous with the opening of the Lime Kiln Channel in 1889 a fall was noticeable in the relative elevation of Lakes Huron and Erie, and in the six years from 1890 to 95 inclusive, the mean elevation of the surfaces of these lakes were 0.58 of a foot nearer together than during the period from 1860 to 1889 inclusive and 0.27 of a foot nearer than during any six-year period in that time. From 1896 to 1906 the lakes remained in nearly the same relative position, but during the four years, 1907 to 1910, they have approached each other 0.22 of a foot more. The average difference of elevation for the 21 years from 1890 to 1910 inclusive was 0.58 of a foot less than for the 30 years from 1860 to 1889 inclusive, while for the months from April to October inclusive of 1911 they are 0.93 of a foot nearer together than the average of the above 30-year period.

Since the water of Lakes Huron and Michigan flows through Lake Erie, any decrease of the latter by excessive evaporation, deficient rainfall or diversion should reduce the level of Lake Erie in a similar amount to that by which the Michigan-Huron level is lowered, as over 95 per cent of the water discharged from Lake Erie comes through the St. Clair River. The increase of fall in the surface of Michigan-Huron over that in Erie can only be accounted for by changes in the outlet of the former and hence it appears that channel improvements have lowered Lakes Michigan-Huron nearly eight inches since 1889.

The mean elevation of Michigan-Huron for the thirty-year period was 581.91 and for the twenty-one year period 580.54 showing a total fall of 1.37 feet, while the corresponding elevations of Erie were 572.92 and 572.13, showing a fall of only 0.79 of a foot or 0.58 of a foot less than Michigan-Huron as above stated. It was recently a contention of the Lake Carrying Interests that any lowering of the Lakes was a serious detriment to navigation and hence presumably to the general welfare.

On this point, however, the evidence does not seem to be all one way, though if the contention be correct the navigation interests themselves are the greatest transgressors. Considering the question first from the standpoint of navigation, an examination of the records of accidents on the waters connecting the Great Lakes for the period from 1904 to 1908 showed that 68 per cent were attributed wholly or in part to the influence of the current. Any lowering of Lake Huron with reference to Lake Erie has the effect to decrease the slope of the connecting waters and therefore to reduce the current and so contributes to the safety of navigation. If Lake Huron were drawn down to the same level as Lake Erie there would be no more current in the St. Clair and Detroit Rivers than now exists through the Straits of Mackinaw, where part of the year the flow is from Huron to Michigan, and part from Michigan to Huron.

From the standpoint of Chicago, the greatest city of our country except New York, were Lake Michigan restored to its former elevation serious interference would result to the drainage and sewerage systems, lands now above water and at all times usable, would be subject to submergence at intervals, and the safety of the works along the drainage canal might in places be questioned. On the other hand, a lowering of Lake Michigan would be met with rejoicing by every riparian owner along its borders. Assume for a moment that its waters were lowered four feet, there would be made available a strip of land one hundred feet wide on the average around its entire circumference, and the value of the property so acquired would more than pay the cost of reproducing for navigation the depths of water now utilized. So accustomed have the navigation interests become to feel that the Great Lakes were established by an allwise Creator for their especial benefit that the foregoing bare suggestion is likely to be branded as the rankest heresy, and it may be worth while to digress for a moment and consider the grounds upon which the "paramount right" of navigation rests.

In prehistoric ages the only public use of water ways was for transportation. The water supply and the sewage disposal of the barbaric communities were problems of far too little moment to worry the widely separated inhabitants of early days, but the right of a man to float his canoe upon the lakes and streams was early recognized. In many places in the American Colonies, and particularly in Virginia, the rivers and creeks formed almost the only highways and as such were free to the traffic of all, and though the right of the navigator to land from his boat was subject to the will of the riparian owner, his right to navigate was unquestioned. Congress by the Constitution was given authority to provide for the general welfare, and under this clause has passed numerous laws confirming the rights of navigation, but with the modern centralization of population into great cities new problems have arisen, and while the railroad and the highway have appeared as substitutes for the water way, in many cases completely supplanting it and thus demolishing the very foundation of its paramount right, new but not less paramount uses for the waters of the Great Lakes have arisen. The cities along their borders either directly or indirectly are drawing from them the water needed for domestic and manufacturing purposes, and while the amount so used, even

in the aggregate, is relatively small and is mostly returned to the lakes again, the principle is established that this is and must continue to be the paramount use. Beyond this a further use has been found by this great city in the dilution and removal of its sewage, which for many years polluted its own water supply until the death rate from water borne diseases in Chicago was a disgrace to civilization. At last her citizens awoke and adopted what was then considered and is still recognized to be the most feasible method of sewage disposal. At an expense of more than 65 millions of dollars a great canal and water way has been constructed along the line of the ancient outlet of Lake Michigan, and since its opening hundreds of lives have annually been saved among the people of Chicago and their visitors. Time passed and the quantity of water originally diverted became insufficient to properly perform its function of safely removing the sewage of the rapidly growing population of Chicago, and an attempt was made to utilize the further quantity needed. Then what happened? The great shipping combination, the Lake Carriers' Association, which controls 90 per cent of the shipping on the Great Lakes, of which 90 per cent one company engaged solely in the transportation of iron ore controls 37 per cent, prevailed upon the United States to refuse to Chicago permission to protect the health of her two million of inhabitants, and an injunction was issued out of a United States court, restraining the city from carrying out its plans, and the case is still unsettled. Here we have Lake Michigan, a great pond, owned wholly by four states, Michigan, Wisconsin, Illinois and Indiana, through whose outlet the direction of the current can hardly be determined, and an attempt made to prohibit the citizens of those states from using the water for the highest use to which water can be put, to protect the health of man. Already, as is shown by careful and extended investigation, the water flowing in the Drainage Canal is woefully insufficient to properly dispose of the sewage it carries, and the mixture is becoming a nuisance to the communities through which it flows, but the great shipping combination at whose behest the waters of Lake Michigan have been already lowered a foot, says no more diversion lest the lake be lowered an inch or two and the cargoes of ore we carry be decreased.

It is true that freight can be carried on the lakes for a much lower cost than on our railways, but of what does the lake commerce consist? In 1910, of that passing the St. Mary's Falls Canal, 34 million tons was ore bound south, 9 million tons was coal generally bound north, and 7 million tons was miscellaneous products, including grain and flour; or less than one-third was material in which the ordinary citizen is directly interested. The Government has provided, without expense to the carriers, their roadbed, switches and signals and while, theoretically, these are open and free to all, practically none but the favored few can afford to avail themselves of them. At what rate might we expect our railroads to carry freight if they were relieved of all expense of roadbed, switches and signals? Six million dollars are estimated to be spent in improvements to navigation on the Great Lakes during the next two years. And for whose benefit? The only users of the lakes requiring deeper channels are the ore carrying vessels. The package freighters and the passenger carrying boats all require much less water than the present channels afford, but you and I and every citizen of the United States helps pay the bills, while the citizens of the great state of Illinois are being deprived of the moral right to make the best possible use of a natural resource at their doors, and the neighboring states of Missouri, Kentucky, Tennessee and Arkansas are incidentally affected to their detriment.

The climatological uses or influences of the Great Lakes have

long been recognized, and the evaporation from their surfaces and the absorption of heat in the summer, together with the return of the so absorbed heat to the atmosphere during the winter months, are important factors in the moderation of extremes of heat and cold in the Lake States. Whenever one mile of ice freezes one foot thick there is given off as much heat as would be obtained from burning ten thousand tons of ordinary coal, and if Lake Michigan should freeze over its entire surface to an average depth of one foot, the heat released would be equal to one-sixteenth of all that is produced annually by coal mined in the United States. In passing from a temperature of 62 degrees to one of 32 degrees Fahrenheit about 20 per cent as much heat is given off by water as when freezing. This heat set free as the water cools is reabsorbed when the water warms, and hence to a very large extent ameliorates the extremes of temperature.

Of the rainfall on their drainage areas Lakes Michigan and Huron receive as surface runoff about 40 per cent or about 0.8 cu. ft. per second per square mile, Lake Erie receives less than 30 per cent or about 0.65 cu. ft. per second per square mile, and Ontario receives about 60 per cent or 1.44 cu. ft. per second per square mile.

The rate of evaporation from the surface of Lakes Huron and Michigan appears to be about 6 per cent less than from their land drainage. From Lake Erie it appears to be about 90 per cent greater than from its land drainage, and from Ontario about 76 per cent greater than from its land drainage. For Lake Superior the information is so limited that it is only possible to guess that the rate of evaporation from the Lake is greater than from the land surfaces. These conclusions are based on the discharges computed by the United States Engineers, and when analyzed seem to indicate that, if the rainfall on Lake Erie was the same as on its drainage area, the evaporation was 44 per cent greater than that rainfall, or in other words, if it were not for the inflow from the upper lakes, Lake Erie would dry up to a narrow river. So far as evaporation records go there seems little reason to anticipate such a calamity, and it is difficult to explain the difference in evaporation from Lakes Erie and Ontario, on the latter of which it appears to be only half that on the former, especially as the direct observations show the Erie evaporations to be only 15 per cent greater than those of Ontario. A very obvious suggestion is that there may be something wrong with the estimates of flow in the Niagara River, and if so it becomes a matter of importance to both the navigation and the water power interests.

The use of the Great Lakes for the development of power to supply light, heat and energy to the communities along their shores is an entirely legitimate use and one that as the supply of available coal decreases, may in time become paramount, at least over navigation. In fact it may even now be pertinently asked which is the greater, the one who carries a commodity to market or the one who produces it before it can be carried.

The possibility of economical power development by the present known means from the waters of the lakes is confined to the St. Mary's River, where about 170,000 hydraulic horse powers are available; the Niagara River, where about 7,000,000 horse powers exist, and the St. Lawrence River, where about 6,500,000 horse powers can be utilized. To correlate this power to something more tangible than mere figures, it may be said that the combined power of the above three rivers, if delivered at the wheel shaft of turbine wheels, would amount to one-fourth as much as could be obtained with the best engines from the coal ordinarily mined in the United States if it were all used for that purpose.

Here we have a vast natural resource, one of the most valuable that nature has given to man, being absolutely and forever wasted. The power now developed at Niagara, the "Soo," and on the St. Lawrence is only a drop in the bucket. "A mill can never grind with the water that has passed," and every day that this water power goes undeveloped, there is an absolute loss to the people of America and of the world, of approximately one million dollars; three hundred and sixty-five million dollars a year; half as much as the value of all the commodities carried on the Great Lakes in 1909. Unlike minerals, lumber, and animal products, water power unused is not saved to posterity, but is gone forever, and the people of this great nation should awake to the fact, and their representatives in Congress should see to it that the laws governing the use of the waters of the Great Lakes are adjusted to the requirements of the Twentieth, rather than of the Eighteenth Century. (Applause.)

PRESIDENT FOWLER: We now come to the regular program of the afternoon. We seem to have had a singular experience at this Congress, for in all the congresses I have attended I think I never have seen or known of so many appointments that have been agreed to that have been interfered with by one reason or another, and the appointees themselves, who had accepted appointments to present papers at the Congress, were prevented from carrying out that understanding.

We have another one this afternoon. We have just received a telegram from the Hon. John Barrett, who was to have spoken to us on "Pan American Co-operation in Irrigation and Drainage." Mr. Barrett is Director General of the Pan American Union. I saw him but a comparatively short time ago and reminded him that a year ago at Pueblo he was not able to meet with us as he anticipated and as we expected, and in accordance with the arrangement that was made. He said: "This year I am going to see if I cannot carry out my agreement. I will be with you if it is a possible thing." This telegram has just been received:

TELEGRAM FROM JOHN BARRETT

"I cannot tell you how sincerely I regret that unexpected developments will prevent my attendance at your great congress. I had counted on being there, but an important meeting of my governing board this afternoon will prevent. I have the greatest interest in the work which your Congress is doing, and its influence is spreading throughout other countries of America with the result that great plans and projects are under way in our sister republics for irrigation and reclamation which will add vastly to the prosperity of the western hemisphere.

(Signed)

"JOHN BARRETT, Director."

MR. T. U. TAYLOR, of Texas: I was struck with the number of absentees in the names on the program, and I move you, sir, that their papers be considered as read by title, and that they may be available for publication and the secretary may get them.

PRESIDENT FOWLER: If there is no objection, the Chair will consider this acceptable to the delegates of the Congress. I believe in such cases in the past it has been the custom of the Congress, where a gentleman was requested to prepare a paper and so agreed, but was prevented by entirely unforeseen circumstances, to consider it only courtesy on the part of the Congress that his

paper should be included in the Official Proceedings as they were printed.

We are to be favored this afternoon with a number of addresses by representatives of foreign nations.

H. E. Frederico Mejia, Minister of Salvador, is unable to be present, so we will pass to the next one with whom many of you are familiar because you have heard him at former congresses, Hon. R. H. Campbell, Director of Forestry, Canada.

Address by
R. H. Campbell
Director of Forestry
Canada

Mr. President, Ladies and Gentlemen:

Your President has introduced me to the convention as the Hon. Mr. Campbell, but I must disclaim that title. I am not a member of the government, and if I had happened to be a member of the government at the time I was appointed to come and represent Canada at this convention, I do not believe that I would have been here at all, because probably some of you have heard that recently there has been a change of government in Canada.

I, however, represent the Dominion and represent the Department of the Interior, which has charge of the forestry and irrigation work of the Dominion Government. I am very glad to represent Canada here, although I would have preferred very much if some other person had undertaken to do the speaking for Canada.

I have had the opportunity of being in Chicago before; in fact, in a way I just missed being a permanent citizen of the city of Chicago. A good many years ago our family moved over to Chicago from Ontario, with the idea at that time of remaining here permanently, but we moved back again and I do not think that my residence made any great impression either on the city or on myself. My interests at that time were confined pretty much to the location of the candy shop on the corner and my ambitions were to get an opportunity some time in my future existence to drive the white horse that drew the fire engine that used to pass by the place where we lived. (Laughter.)

Representing the Dominion of Canada, I think the fact that I am here, although there has been a change of government, is an evidence that the service of the country as it is with you is being placed on a stable basis, and that, even though changes of government may come, the civil service is being placed on a permanent basis and that the main affairs of the administration will go on much as they have before. I think I may perhaps be speaking a little egotistically when I speak well for the civil service of the country, but I think I may state for our civil service, and I am sure that you will agree with me that the same thing is true to a very large extent of your civil service, that the men who are in it are desirous of rendering the country which they serve the best public service they can, and of contributing to its best development and to its growth and prosperity. Consequently we are developing our department much as you are doing in this country, developing the scientific departments, the investigation departments, and trying to lay the foundations for a practical development which will be along right lines and which will be permanent.

We have a vast extent of territory in our country and we have looked on it as practically boundless in its resources. When it was a question of the extent of country that we had and the sparse-

ness of the population that we had, the resources might well be considered as practically inexhaustible; but with the general awakening that there is in regard to the matter of the conservation of natural resources, we have caught the spirit and have been looking into the question as to how we stood upon those matters. I do not know but what if we had had more of a Scotch population that we might have begun to save a little earlier. If you will pardon me for illustrating the point of view by a story, I might perhaps explain to you what I mean.

There was a rather enthusiastic lady visited Scotland at one time and in one of the glens there she met an old highlander, and admiring the beautiful view there was there, she exclaimed to the highlander: "What a beautiful outlook this is. What a beautiful prospect. Splendid!" "Aye," the Scotchman replied, "but you have got to go fifteen miles to get a glass of whusky." "Oh, well," she said, "you can get whisky and keep it in stock." "Ah," said Sandy, "but whusky won't keep," and that has been the trouble with our resources. (Laughter.)

We are going to keep on using them, but we find that they will not keep until the time when we are going to draw on them extensively. So we have begun in our country, as you have carried it further in your country, a policy of conservation which has many branches and many ramifications. The particular subjects that are of interest to this Congress are those relating to the water supply, and perhaps in connection with that, in relation to forest preservation.

There is no question whatever when we begin to consider the question of the water supply, that we must consider it, as was stated this morning as a whole. When we take up a great water-course such as the Saskatchewan River in our country, which rises in the Rocky Mountains and flows across a thousand miles of prairie until it finally issues into Hudson Bay, there are very many factors that influence the flow of that stream, and there are very many uses for which it is required. In the lower reaches, at least, it will be required for navigation purposes, and at the present time the government of our country is making a very careful investigation of the lower part of the great Saskatchewan system to find out how far it is navigable and how far its navigability can be improved. It is in some ways like your Mississippi River, inasmuch as there are many sandbars in it which keep changing their location and shifting in such a way as to make it very difficult to keep a channel for navigation open; but with the increasing population and with the increasing demands for transportation, our country has begun to think that we must try to make use of the waterways as well as the railways, and so enlarge our possibilities of transportation and cheapen transportation as well.

But when we begin to consider that system, we must consider it not only in those lower reaches, but we must go back and find how it is influenced in every other way. We go back up along the stream and get into foothills and into the mountainous districts and there are factors there that must be considered. There is the question of the regulation of the flow of that river by storage reservoirs, and the question of the regulation of it, so far as it can be regulated, by the protection of the forests on that great eastern slope of the Rocky Mountains.

That brings in new questions. We must investigate these reservoir possibilities on the upper courses of this stream, and, in consequence, not only are we investigating the navigable possibilities lower down, but we are having some investigations begun to find out how far there is storage capacity in those mountains and

how far we can utilize it for making more regular the flow of the stream.

Then again we have the forests on that eastern slope. I know that the question of the influence of forests on precipitation and on run-off is a matter on which there has been considerable controversy, but I think that it is agreed that whatever the effect of precipitation may or may not be, the effect on run-off is undoubted. How great that effect is may not be definitely ascertained, but the fact that the forest, and all that grows in the forest, offers an obstruction to the run-off is, I think, clear evidence that the forest is an influence on the conservation of the water flow. And so that opens up to us the question of the preservation of the forests on the eastern slope of the Rocky Mountains, and we are now trying to protect that forest slope from fire, which has done a great deal of damage upon it in days gone by.

We perhaps have not gone as far into forest destruction as your country has, but from our investigations of the forests on the eastern slope, we find that while the greater proportion of it is forested with trees of greater or less age, the mature forests on those eastern slopes do not amount to much more than 25 per cent of the whole forested area. So that the question of the protection of that slope from forest fires is one of great importance and one which we have begun to take up and which we propose to take up thoroughly.

In this work I may say quite freely that we are taking the opportunity of learning all that we possibly can from the methods which are in use by the Forest Service of the United States. We perhaps could learn very much from what is being done in European countries, but your Forest Service has adapted the European methods to United States conditions which are very similar to Canadian conditions, and we are going to pirate just as much as we possibly can of their methods in administration, because we feel satisfied that they are based on right lines and that they will work out satisfactorily under our conditions.

In regard to irrigation work in Canada, there are two great and distinct districts in which irrigation is required; one of those is in the Province of British Columbia, which is under the administration of the government of that province and will be dealt with by the Hon. Mr. Ross, who is in charge of the Department of Lands of that province, and so I shall not say anything in regard to it; but will say just a few words in regard to that portion, the administration of which comes under the federal government.

Perhaps I should explain that our system of government, insofar as the relation between provinces and the federal government is concerned, is very much the relation which exists between the states of your nation and the federal government, with this exception in regard to the irrigation administration where the matter is in the hands of the Dominion government, that the control of the water supplies is entirely in the hands of the Dominion government, as well as the control of the lands, so that both the administration of the water and the administration of the lands are carried on together. This gives the possibility of making a somewhat comprehensive system of handling the administration. The things that had to be considered in establishing our legislation were, first of all, the giving of a sure and a clear title both to land and to water. That involves several things.

The first thing is that, as the water supply is not sufficient for all the land that may require to use it, we have to get some idea of what our water supply actually is. This we are undertaking by a hydrographic survey which follows very much the lines of your hydrographic survey. We are carrying on regularly our measure-

ments of the streams in the northern district, and we are now reaching a point where we are able to determine with some degree of certainty what the water supply in each of these particular water courses is. I may say that our work in irrigation is not, and never will be, as extensive as the work in this respect is in the United States, because the areas in Canada which require irrigation are not so extensive as yours; and, even in the districts in which irrigation is practiced, the rainfall is fair, except in occasional dry years, so that irrigation is more of an auxiliary than an absolute necessity in most cases.

Our system is that, having ascertained the quantity of water that there is available in any particular stream or water course, application has to be made in the regular way to the office of our Commissioner of Irrigation, whose headquarters are at Calgary in Alberta, which is practically the center of the irrigation district. When this application for water is made, reference is made to the water supply papers, to find out just what water is there and what water is available. I am afraid that sometimes we have perhaps in cases given a little more water than there is in the streams, on account of our not having had the knowledge early enough of just what those streams would supply, but so far as we have ascertained, and when we have ascertained with fair definiteness what the flow of the stream is, we do not grant any rights beyond the flow of the stream as the flow is ascertained to be.

Then when this application comes in and it is evident that there is water available, an examination is made by one of our engineers to see how far the scheme is a feasible one, whether the water can be got upon the land and what area can be irrigated. If this is found to be satisfactory our engineers so report, and finally the works are authorized, a certain time is given for completion, if necessary extensions are allowed, if it is absolutely necessary, and at the end of the time the works which have been constructed are submitted for the inspection of our engineers, and, if then found satisfactory, a final license is issued which gives the man or the company to which this is granted the right to that quantity of water. So that you see the system of titles is a pretty clear one, and the right to the water, when it is once granted, is one that is fairly sure.

You have advanced in some respects considerably farther than we have. We have not yet undertaken any work such as is done under the Reclamation Act in this country or by the Reclamation Service. It may be that, as matters advance, the government will have to step in and construct some works, either by government moneys or by levying on the lands, as has been done under the Reclamation Act; but up to the present time the demands on our water supply have not made the government feel that such action was necessary. But we have inaugurated an Irrigation Convention, as we call it, and we are beginning to press this question on the attention of the government.

I think the work that has been done by this great Irrigation Congress on this side of the line is making them emulous of doing something along the same lines to develop our country and to impress on the government the lines of work that should be taken up and carried out to bring about that development. They are pressing on the attention of the government at the present time work somewhat in the line of what the Reclamation Service is doing.

I am sorry, Mr. Chairman, that the invitation to address the convention did not come to me a little earlier, so that I might have prepared more fully and perhaps have given you a little more information, and possibly have said something more interesting than I can have said at the present time. I can only say again that

representing the Dominion of Canada, I am very glad indeed to have the opportunity of attending the Congress, of renewing the friendships which I have had the pleasure of making at previous congresses, and of conveying to you as citizens of the United States the good wishes and the good will of the people of Canada. (Applause.)

PRESIDENT FOWLER: The last speaker has reminded me of the fact by some remark that he made, that two years ago or perhaps a year ago, I was guilty of trying to attach the title of "Honorable" to him. He denied the allegation and pleaded not guilty. Remembering the early teachings of my youth, that if you do not succeed at first, why, try, try again, I tried it as you see. (Laughter.) I returned to the attack and here again he denied it. I am reminded of a presiding officer in my native town in Massachusetts, rather an eccentric character, presiding at a meeting where there were some 20 or 25 present and only four or five were in favor of a certain motion that had been made. After the discussion the chairman said: "All those in favor of this motion will signify by saying aye." Four responded. He said: "It is a vote." One of the parties present jumped up and said: "Why, Mr. Chairman, you have not called for the nays." "Aye, aye, sir, I know it, but I have declared it a vote and dum it, it is a vote." (Laughter.) So I think I shall stick to this attempt to attach the title of "Honorable" to our friend, Mr. Campbell, and perhaps after awhile I shall be able to say: "Dum it, it is Honorable." (Renewed laughter.)

We will hear next from Dr. Kaumanns, the German Agricultural Commissioner of Germany. Dr. Kaumanns is a resident, I believe, of this city, and one whom we are familiar with from having heard him at past congresses. We are very glad to hear from him again. (Applause.)

Address by

Dr. N. Kaumanns

**German Agricultural Commissioner
Germany**

Mr. President and Gentlemen:

To the regular attendants at Irrigation Congresses I am not a stranger, and you know that my interest in your large undertakings in the field of irrigation brought me in the past years to visit these Congresses. You Americans believe that no country in the world is equal to yours in the development of agriculture—the American, also, believes that the increase in population and the growth of his various industries in the past 40 years lead the world. Having traveled a great deal, you will permit me to say that there is another country which can show greater advances, and that is my own country, Germany. Not only has the development of agriculture kept pace with the increase in population (averaging 900,000 persons annually), and the additional demands of Germany's great increase in the fields of industry, but, I am proud to say, the agricultural development is in advance of it.

And I am proud to tell you that not long ago one of your great agricultural leaders paid Germany the tribute that her science of agriculture is the model for the world. But do not take it that because I speak thus of my Fatherland, I wish it understood that no other land can teach us anything; not at all. Germany has never reached that point where it is not willing to admit that, in many things, it can yet learn in other lands. So on this occasion, I admire America for its large irrigation projects and the successes

you have had by the different Irrigation systems in the development of millions of acres in your Western states.

I am so often asked, "what interest has Germany in Irrigation?" If you will study the weather cards of Germany, you will find some portions of that country have less rain-fall than you have in some of the arid regions in your Western states. Therefore, the Prussian government has large experimental fields at Bromberg, where the different systems of irrigation are applied and this institution is always alert for the newest and most practical irrigation system. This illustrates that we never assume that we know it all and we are thankful every time we learn something from other countries, not referring at all to our Colonial possessions in Africa, where in many parts irrigation will enable us to have the great successes we expect in the future. No doubt, this Congress will create great interest in the "Back to the Land Movement" among the millions living in this city, and if any portion of them do not care to go to the West, I feel that we can say to them that we will make room for them in Africa. I am pleased to say that I have learned a lot about irrigation for my personal information and also for the interests of my country in this big land of yours.

I am called an expert, and one of the duties of an expert is to criticise, and probably this induced a gentleman yesterday to ask me to criticise American Irrigation. However, you are here to win people from the city to the farm, and if I went too far I might discourage them. Nevertheless, you will pardon me if I touch on one or two points. I would like to suggest—we have no time to discuss it—it might be well to study more thoroughly the right use of water, especially where the farmers have the free use of the water as you have it in some parts. There too much water is taken and too much water does more damage than benefit to your culture plants; in other parts your large companies have taken too much land for irrigation on the same river and when the culture plants were in the greatest need of water, there was little or none to be had. I have also noted that many farmers own too much irrigated land and could not give it rational attention so as to get the full benefit out of high priced farm land.

We know certainly to-day that the greatest enemies of agriculture in your country were the men who cut down your wonderful forests and in taking the timber also took away the natural water reservoir, which in the summer supplies your rivers. Two years ago I fully discussed this question at your Congress. We, also, are familiar with the mistakes your farmers made in your great wheat states. Let the irrigation farmer apply these lessons to-day. He thinks he has water and that water alone will be sufficient to give him, year after year, the same extraordinary crops. Certainly virgin soil gives with full hands, but just as the human body needs recuperation and can do little if you do not supply it with its needs for everything you take from it, so also, the soil must be given in return the things that the product of the soil takes from it. It is necessary to repeat continuously to farm intensively by using proper manure and fertilizers.

One thing we are all agreed on, whenever we mention the great growth of your towns and cities, is that it would be better for the country if we could induce a large percentage of the urban population to go back to the soil and to instill in them the spirit which Huret calls so nicely "Back to the land." There is nothing easier for town people, who are not experienced agriculturists, than to go into the irrigation districts to farm. Ordinarily I do not believe in the city man going on the farm, for experience has shown so often that a good farmer must be made of other stuff than the average city man, but on irrigation farms we do not have the same problems to deal with as in general farming, because in irrigation districts we find mostly specialized agriculture, like fruit raising, and the owner can learn from his neighbors while the trees are growing. This gives him enough time

to become familiar with his new calling and the year or two spent waiting I never consider lost.

Immense progress has been made in the past decades in American agriculture and your Secretary of Agriculture is justified in pointing with pride to the phenomenal value of the yield of the American farm and a study of his annual reports will show that agriculture is still the leading industry of your country and your Congress will continue, I hope, as it has in the past, to add to this industry, and thereby be of immense benefit for the future inhabitants of your great land. (Applause.)

PRESIDENT FOWLER: The Secretary has some announcements.

SECRETARY HOOKER: In connection with the committee announcements, I wish to remind you again that Chairman Hutton has called a committee meeting of the Resolutions Committee at 4:30. The meeting will be in the room opening off of the balcony foyer, immediately over the entrance to Orchestra Hall.

Chairman Case, of the Committee on Permanent Organization, has called a meeting of the Committee at 5 o'clock in the room which has been permanently provided for that committee, in case it cares to avail itself of it, which will be found in the Auditorium Theater, above the registration office.

Chairman Turner of the Credentials Committee has requested that the meeting be called at a time most convenient for the members of the Committee, and I would suggest that the Committee meet about fifteen minutes following the adjournment here. The meeting will be held in what is known as the Parlor Room of the Auditorium Hotel, on the first floor above the main floor, in the northeast corner.

PRESIDENT FOWLER: I am in receipt of several telegrams that have come to parties in this city asking that the city of Houston, Texas, be selected for the Twentieth Congress. These telegrams will be referred to the Committee on Permanent Organization, and if the parties desire to meet with the Committee on Permanent Organization they can make an appointment with the chairman of that committee, Mr. Case.

Before proceeding we will have a resolution read by the secretary.

SECRETARY HOOKER: Resolution submitted by Horace W. Sheley, of Utah:

The Secretary then read the resolution recounting the need of thorough topographic knowledge in water development problems, commending the work of the Topographic and Water Resource Branches of the United States Geological Survey and urging more liberal appropriations therefor.

PRESIDENT FOWLER: Referred to the Committee on Resolutions.

SECRETARY HOOKER: Resolution submitted by E. F. Bohm of Ohio.

The Secretary then read the resolution setting forth the harm done to the irrigation movement by unscrupulous manipulators, and authorizing the appointment by the Board of Governors of the Congress of a commission to draft a uniform code of irrigation laws and to control the sale of irrigated land to be brought to the attention of the proper officials.

PRESIDENT FOWLER: Referred to the Committee on Resolutions.

We have a communication from the Board of Trade of the City of Chicago which the secretary will read.

SECRETARY HOOKER: The communication reads: "B. A. Fowler, President, Nineteenth National Irrigation Congress, Dear Sir: The Board of Trade of the City of Chicago take great pleasure in ex-

tending a most cordial invitation to the representatives and delegates of the Nineteenth National Irrigation Congress to visit the exchange rooms at their convenience. The sessions of the Board convene at 9:30 a. m. and close at 1:15 p. m., except on Saturday, when they close at 12 m. All wearing badges will be promptly admitted.

Very truly yours,

(Signed)

J. G. F. MERRILL,

President, Board of Trade of the City of Chicago."

PRESIDENT FOWLER: We will now hear from Mr. C. W. Sutton, Chief Engineer of the Irrigation Service of Peru.

Address by

C. W. Sutton

Chief Engineer of the Peruvian Irrigation Service

Mr. Chairman, Ladies and Gentlemen: Although the appreciation of the Peruvian Government for the privilege of representation in this Congress has been expressed through the Department of State, I feel that it cannot be out of place for me to thank the organizers of the Congress, in the name of Peru, for the good will and interest which their invitation has signified. Perhaps the most effective way to express these thanks will be, however, to describe briefly the conditions that affect the development of Peru, and to indicate in a general way the steps that the Government is taking to foster this development.

If the importance of irrigation enterprises is to be measured only by the area affected by them, then there might be little to say of Peru as compared with the Great Domain of the United States. Yet the irrigation of the arid lands of Peru is essential to her economic growth, and the geographical conditions that constitute the problem are of a character to excuse more than a passing notice. Before speaking especially of the arid regions, however, it will be convenient to describe briefly the entire National domain.

Travelers who have visited Peru, those who have studied the development of Peru, even those who have merely read its history, will all agree, I believe, that of all the things that have impressed them, the Andes mountains stand out most prominently, and, in fact, form the matrix, as it were, for all other impressions, when one begins to reflect upon the relation of the geography of the country to its history, past and present. The Andes in fact, constitute the determining factor in any classification of the Peruvian National Domain. They constitute a geographical fact to which all comprehensive projects for the development and administration of the country must conform. There is no part of the National Domain whose climate, soil, and water supply are not explained by their existence.

The Andes Mountains form a high plateau-like Divide, at a general altitude of fourteen thousand feet above sea level, and at a distance of about seventy-five miles from the Pacific Coast. They divide the National Domain into two parts, quite distinct in climate and physiography. Rains that fall on the east of the Divide find their way into the Atlantic Ocean through the Amazon and its tributaries, forming one great river system. The rainfall of the West Slope of the Divide feeds numerous rivers of the Pacific Coast. The area of the Amazon or Atlantic Drainage Basin, in the territory of Peru, is about 325,000 square miles. The various water sheds of the Pacific Coast sum to a total of about 115,000 square miles.

Upon the Atlantic Slope of the Andes are to be found such a diversity and abundance of plant life that only a skilled naturalist could begin to describe the region. The rainfall varies from three to five feet on the summit of the Transcontinental Divide to twelve and

fifteen feet in the Interior. The tributaries of the Amazon are navigable for considerable distances, and the Amazon itself is an actual route of travel for ocean-going steamers. Forests of great value cover the entire eastern part of Peru, and the rubber tree is a natural growth, both upon uplands and lowlands. Placer gold is found in practically all the streams, and dredging operations are being carried on, in some places. From the few square miles of the approximately 200,000 square miles adapted to the production of rubber in this region, Peru exports annually three thousand tons of that product, valued at approximately \$2,500,000, United States currency. This great region is practically undeveloped. The Andes may be considered as a wall fourteen thousand feet high, separating the business and administrative centers of Peru from the resources of its interior, but the great river system of the Amazon furnishes a means of water transportation directly to the Atlantic, and the ports of the world, and this river system will some day become the route of traffic between one-half of the Peruvian territory, and the outside world.

Railways are being built across the Transcontinental Divide to furnish the administrative control needed to safeguard the inception and development of enterprises in the interior, and to feed the river system referred to, and sooner than some of us may expect the great engineering problems that exist in this region will be in process of solution. The head of navigation on the Amazon reaches to within three hundred miles of the Pacific Coast. That is to say, Nature has provided in the North of Peru an open road across the widest part of the Continent, requiring for its completion a railroad of much less length than the distance from New York to Chicago. The Government seeks to build this railroad and has paid to a German syndicate the expense of survey. It is probable that German capital may build the road. English capital, it should be said in passing, controls practically all the other railways in Peru.

The conditions on the Pacific Coast of Peru are quite different from those just described. The rainfall varies from a maximum of from three to five feet on the summit of the Andes to less than two inches at sea level on the Pacific. Rising upon the summit of the Andean plateau, the rivers of this region have cut their way frequently ten thousand feet below the present tops of the ridges that diverge from the Main Divide. Frequently, at a distance of thirty miles from the Coast, the rivers emerge from their deep canyons upon a plain of relatively gentle slope; although this plain is broken in many places, by ridges running out from the base of the Andes to the sea, it may be considered as a characteristic feature of the Coast. All of it was during comparatively recent geological times, occupied by the Pacific Ocean, and the parts of it which do not appear have sunk again or remain below sea level. The character of this plain and its relation to the rivers which cross it is of primary importance to those interested in the problems of irrigation.

In the general way in which we have considered it, the Coastal Plain is fourteen hundred miles long. In some places, it reaches a width of forty miles; in others, as already remarked, its width is reduced to nothing, where the plain proper lies below sea level. For the purpose of exact description, it should be divided longitudinally into two parts presenting marked differences. The Northern part of the plain, extending from about the port of Pisco as far as Ecuador, is usually terminated on its Western edge by a low escarpment, from ten to one hundred feet or more in height, formed by the action of the waves of the Pacific. From this escarpment, the plain slopes gradually up to the base of the Andean Plateau. The Southern part of the plain is modified in the southern part of Peru by a range of hills rising abruptly from the sea and running parallel thereto. Back of this secondary range lies the coastal plain at a general level much higher

than that of its northern continuation. The southern coastal plain in fact is a fill consisting largely of volcanic ashes, often one thousand feet deep, occupying the natural depression formed between the secondary range referred to and the base of the Andes.

The river valleys of the coast have been excavated in some cases to a depth of five hundred feet below the level of the floors of the valley to-day, and subsequently refilled with alluvial detritus up to their present level. These valley lands are the only ones upon which agriculture is practiced to-day upon any considerable scale. In many valleys, owing to the imperfect development of irrigation work, thousands of acres of good soil are uncultivated.

The total area of the coastal plain, including the filled valleys referred to, and excluding the heights of land that interrupt the continuity of the plain, is approximately 25,000 square miles, according to best available information. One thousand square miles are actually under cultivation, and about one thousand more have been reported irrigable at one time or another, by governmental or private examiners. Although upon detailed examination all lands so reported may not be found economically feasible of irrigation immediately, it is probable that an equivalent area, and much more can be added to the present cultivated area. The amount of water annually flowing in the coastal rivers is great, much greater in fact than can be utilized in many cases, but the problem of controlling the flow is frequently made costly by the steepness of the river slopes. However, there are a number of streams where the minimum flow is not all utilized, and the high productivity of the land makes possible a high capitalization.

It will greatly assist in understanding the irrigation problem of the coast of Peru, if we remember that, not only are the seasons reversed there, with respect to the seasons here, but the periods of maximum stream flow bear quite a different relation to the seasons. Here we have a period of flood flow in the spring just at or near the time when the farmer needs water for his planting. As the season advances, and the crops approach maturity, the water supply diminishes, and where storage or other regulation is required, it is for the season of advanced growth, which is also in this country the season of greatest evaporation from the soil. On the coast of Peru just the reverse is the case. The season of minimum flow occurs in September or October, in the early spring of that hemisphere, and while on some streams a temporary increase of flow occurs in October, a relative low flow obtains during the spring, and the floods do not arrive until summer, continuing into the fall season, March and April. Where the regulation of flow is required, it is for the satisfaction of the young plants. In the season of crop maturity and for some time before, there is more than enough water for all needs. Of course, it is essential to remember in all that precedes and follows that irrigation is the only means of getting water to the crops.

The seasonal distribution of flow referred to was less an inconvenience in the time of the Inca Dynasty than at present. Then the large population of the empire made it necessary and convenient to grow large quantities of corn. Corn and beans can be planted at any season in Peru, and the Inca's subjects therefore could plant them at the beginning of the flood season, thereby avoiding the necessity of stream regulation. To-day, however, there is a relatively limited market for these products, and the greater part of the lands must be devoted to the growth of crops for export to foreign markets. Such crops are sugar and cotton, and the climate of the coast of Peru, where there is never any frost, is especially fitted for the production of these crops. While the growing season of cotton is six months, and to obtain its maximum development, cotton requires irrigation in spring as well as in summer, it is grown in some localities with irrigation only in

summer. The practice is as follows: The ground being well saturated in March or April, the last month of the flood season planting takes place in June, the first month of winter. Careful cultivation of the surface is carried on, and the plants come up and endure until January, with no further irrigation whatever. In January the summer floods supply abundant irrigation, and the crops come to maturity in March or before, giving from 250 to 500 pounds of ginned cotton per acre, according to the kind of soil, kind of cotton grown, etc. Even where there is perennial stream flow, the low supply in the spring, the low temperatures, and the low evaporation during that season, combine to establish the use of very small quantities of water. Whereas, water is frequently used at the rate of one liter per second per hectare, in summer (one second foot per 70 acres), a rate of one-eighth liter per second per hectare frequently obtains in the spring. Where water is available in the spring, the average production of cotton of the American Upland variety is in excess of 500 pounds of ginned fiber per acre, and the average for the whole of Peru is 484 pounds per acre for all varieties.

Sugar cane for various reasons does not at present produce as great a crop per acre as it does in Hawaii. While poor milling conditions and low soil temperature during the winter are probably a part of the cause for this, the temperature going as low as 40 degrees Fahrenheit, a scarcity of water during the spring months is also undoubtedly an important cause. Where up to date mills are in operation, and a fair supply of water in the spring months is available, crops as great as those grown in Hawaii have been produced. In Hawaii, where a rate of more than one liter per second per hectare obtains during the year, they have a production of fourteen thousand pounds of sugar per acre. In Peru, with a rate of only one-eighth liter per second per hectare, during nearly one-half of the growing season, a production of nine thousand pounds per acre is obtained. The sugar crops mature in Peru in from eighteen to twenty-two months.

The cost of production of cotton is approximately seven cents per pound, United States currency. The cost of production of sugar placed on board in the ports of the Peruvian coast is one and one-half cents per pound, United States currency.

The price of sugar and cotton land actually producing to-day varies in different localities. Such lands have recently been sold, however, with water rights for \$70 per acre. While such lands can be bought to-day, the time is soon coming when the price, in the natural course of events, must rise. The agricultural estates pay good dividends when well managed, and ten per cent is paid on mortgages of rural property.

New lands can be placed in the same productive condition as the lands of actual industries to-day at the same cost of \$70 per acre in many cases, but even with a capitalization of \$150 per acre, with the price of cotton in Liverpool at 12 cents per pound, which has been the mean price for the ten years preceding 1911 for the kind of cotton produced in this region—the profit per acre would still remain more than 15 per cent.

I have said nothing of fruit-growing. This, even when we consider some of the large vineyards near the central part of the coast, is yet a small industry. Yet the fact that all tropical fruits mature in Peru at a time when the season in the northern hemisphere is largely unproductive should suggest what this field may become. The present time from New York to the central coast of Peru is only fourteen days in steamers making fourteen knots per hour.

The development of Peru has been delayed by the geographical conditions which I have attempted to describe, by the lack of data relating to resources, by the fact that established rights to the use of water have lacked accurate definition and control, by the lack of

a market for the great variety of products that can be produced upon its lands, and by other causes. To-day, it is making definite and conscious progress toward adjusting itself to those conditions that must control, and toward the elimination of those conditions which need not control its history. An irrigation service exists for the collection of data of general value to those who may wish to know conditions, and for the design of definite projects. Already, complete data and designs exist for one large project, and several other private projects have been investigated and reported upon by the government service. It is the wish of the government that prospective investors may be protected from the results of inadequate investigation, and the government realizes that in so protecting investors it protects itself. German and Belgian capital have already been invested in the agricultural industry of the coast. American capital has so far failed to interest itself to any extent in this field. The trade of the United States with the West Coast of South America is bound to be influenced by this fact. There is no country in the world where greater good will is entertained toward the United States, and there are few countries to which the Panama Canal more directly conforms itself in the consideration of a general plan of development. If the United States should decide to use the canal for the development of its own trade, I trust that what I have said may be of interest and value to those seeking a participation in such development. (Applause.)

PRESIDENT FOWLER: The last one of our friends, the representatives of foreign nations, is the Hon. W. R. Ross, Minister of Lands, British Columbia, Canada. (Applause.)

Address by

W. R. Ross

**Minister of Lands, British Columbia
Canada**

Mr. Chairman, Ladies and Gentlemen: I represent the Province of British Columbia, which has been referred to by my friend, Mr. Campbell, an earlier speaker on this afternoon's program. I am also a member of the Western Canada Irrigation Congress; my modesty permits me to say that I am president of it, but that arises more from the position which I have held than from any personal qualification which I possess for that high office.

Now, Mr. Chairman, and ladies and gentlemen, since the commencement of this Irrigation Congress I have been rather puzzled to answer the question to myself, "Why am I here," because I entertained the idea that to those of us who are perhaps young and more active, some task would be put to our hands to perform. But I was not called upon, and therefore I have permitted myself to enjoy to its limit the far-famed hospitality of the City of Chicago.

I was also further discouraged by the fact that I have a very intimate friend here in the City of Chicago who lived in our province of British Columbia for a number of years. He lived in the coal mining section of the province at the same time I did, and I had the privilege of having dinner with him last night when he said to me: "Ross, why are you here?" "Oh," I said, "I am a delegate to the Irrigation Congress." "Well," he replied, "I lived in British Columbia for two years, and the only thing I knew there that needed irrigating was dry throats." (Laughter.)

I felt rather discouraged that I should get this answer from my friend. However, if I may be permitted to say a word or two, and I promise you this paper in my hand is not really as long as it looks,

I would like to claim your attention for a few minutes with reference particularly to the province of British Columbia, and what has been going on there in the way of development of irrigation from its legislative standpoint, and also from its practical application.

In the year 1897 legislation dealing with irrigation was placed on the statute books of the Province of British Columbia. As was inevitable at that comparatively early stage in the development of the Canadian West, this legislation was of a slight and imperfect nature, and though it did a great deal in the way of reducing to order the existing chaos, it did not really cope with the great danger of litigation, that is the bugbear of all water administration. In those days the population of the province was to a very large extent composed of the floating element that mining booms attract to a new country, and even the census taken three years later only revealed a white population of scarcely over 150,000 scattered throughout a territory 700 miles long by 400 miles wide.

About 1905, however, a very noticeable change began to be perceptible throughout the province. The great influx into the farming regions of the prairie country created a new demand for the products of British Columbia—for our timber and fruits most particularly. The forest policy of the provincial government that threw open 15,000 square miles of merchantable forest to the investor upon a remarkable and, I venture to think, masterly basis of partnership between the investor and the Crown was bringing an immense amount of outside capital into the province; in consequence of this our other natural resources were beginning to attract attention; there had arisen the heavy demand for agricultural land that has been perhaps the most striking feature of our recent history (so much so that our annual receipts from the sale of land exceed two and a half million dollars, and our surveyors have for years been far in arrears with their work); and on top of this inevitably the value of our water supply was becoming apparent, and applications to record water were beginning to pile up in the public offices until the most painful complications in the way of litigation threatened to arise. In fact, the modern struggle for water had begun in the province.

It was under these circumstances that the government in 1907 hastened to appoint a commission of investigation composed of Professor Carpenter and Mr. Fulton, the Chief Commissioner of Lands. The Commission devoted particular study to the progress made in water administration in Colorado, where natural conditions similar in many ways to those of British Columbia had been dealt with; and it soon reported that immediate revision of our provincial legislation was required. The necessary changes were defined to be:

1. A recognition of the right to store water in reservoirs, to expropriate land for that purpose, and to carry water through natural streams.
2. The investigation and disposal of the excess records that already had come into existence on many streams.
3. The establishment of a definite official administration of water under control of a competent board.

At the beginning of 1909 a most comprehensive Water Act was therefore passed by the legislature, the main principle of which was the granting of the right to water on its beneficial use, the old act not having gone far enough in this direction. A board of investigation was appointed to take in hand the collection of all necessary data, and to this board was given the duty of adjudicating on claims, an appeal being allowed from its decisions to the courts of the land. This board is supported by an annual vote of \$76,640.

From the oratorical point of view I much regret, gentlemen, that the mass of data already accumulated and being added to every day concerning both recorded and unrecorded water available for irrigation and power in the various districts of the province—I much regret

that this data is still in the uninteresting condition that precedes the stage when fascinating statistical computations have been extracted from it to charm the ear of congresses. So I cannot face you like the president of a western board of trade with a bristling array of facts and figures in support of my general remarks. I can only say that an enormous number of applications for water have been and are being made to my board, irrigation projects are under way in almost every portion of the southern section of our province and the utilization of water power is making the most gratifying progress, though only about 160,000 horse power has been developed out of some 2,000,000 estimated horse power.

EXISTING POWERS

Location	Estimated Possible Horsepower		Horsepower Developed
Bonnington Falls.....	275,000	40,000	West Kootenay Power Co.
Stave River.....	60,000	25,000	Western Can. Power Co.
Lake Buntzen.....	60,000	33,000	Vancouver Power Co.
Cascade (Kettle River)....	7,000	3,000	Cascade Waterpower Co.
North Fork Kettle River....	1,500	1,100	Granby Smelter
Goldstream (V. 1.).....	5,000	3,000	Esquimalt Waterworks Co.
Jordon River.....	24,000	10,000	Vancouver Island Power Co.
Rainy River.....	10,000	8,000	David Investment Co.
Quatsino.....	25,000	8,000	David Investment Co.
Ocean Falls.....	25,000	8,000	Ocean Falls Co., Ltd.
Swanson Bay.....	10,000		
Powell River.....	40,000	20,000	
Elk River.....	15,000		
Campbell River.....	100,000		
Nimkish River.....	20,000		
Other Powers (estimated)..	1,500,000		

Concerning southern British Columbia expert reports show that practically all the valleys and benchland at less than 2,000 feet elevation may be turned into productive land of high value by the application of water, and since this country possesses a large number of small mountain streams, the area thus developed will even in the immediate future amount to several hundred thousand acres. Southern British Columbia is in fact destined to be an extensive area of high-priced irrigated land, to quote Professor Carpenter's report; and since the growing of fruit is our specialty and the irrigation of fruit lands is needed in particular at that season of the year when the mountain streams are apt to be low, the future of our development in this direction is seen to depend in a very obvious manner upon the adequate storage of water.

During the last six years the province has attracted a large immigration, so much so that the population has doubled and is now placed by the census at 350,000 persons. One natural feature of this sudden increase has been the excessive growth of our cities, two of them, Vancouver and Victoria, containing between them about half the population of the province. This, of course, is a mere temporary symptom of progress, for in a country where irrigation in the southern region, heavy clearing in the coast sections, and the building of railways in the huge expanse of the central and northern regions must precede agricultural development, it is natural that for a time the growth of cities should be out of proportion to the growth of agriculture. So it comes that rather more than half our consumption of agricultural produce must be imported, even though our home produc-

tion has risen rapidly in value to over \$14,000,000 annually. The situation revealed by these facts shows in a striking manner, both the need and the great field for profitable irrigation.

In the matter of administration, gentlemen, I judge that we stand in a much easier position than do many of the states of the Union, not only on account of the large financial surplus (about two and a half millions) that our finance minister has to administer each year, but chiefly for the simple reason that far greater power is vested in the provincial executive than that to which you are accustomed in the States. Because of this power we are able to act quickly and meet the needs of any situation as it arises; there are no cumbrous delays. I can illustrate this freedom of action by what we have done to protect the water sheds and forest growth upon which the maintenance of our water supply so much depends. We began by spending about \$44,000 on the extinguishing of forest fires in 1909; to meet the disastrous emergencies last year we jumped the expenditure to \$218,000; this year we elaborated our Forest Protection Service and sought to prevent fires instead of confining ourselves to fighting conflagrations that had been allowed to gain headway, and we are now busy upon the creation of a system of forest protection that will, I venture to think, improve upon anything so far attempted upon so large a scale by any government in the suppression of the fire menace. Our forests, our water supply, and our agriculture shall be no longer at the mercy of catastrophes caused by carelessness and neglect. (Applause.)

PRESIDENT FOWLER: I have been requested not to overlook the announcement of the informal reception by the Chicago Board of Control to the delegates and guests of this Congress at eight o'clock this evening at the Art Institute. It is an informal reception, not a full dress affair, you understand. Frequently in affairs of this kind after a delegate gets away from the hall, the fact that it is an informal affair is forgotten, and he says, "I am not prepared for a formal reception," so bear in mind that it is to be informal.

I think that Professor Condra is here in the hall, is he not?

PROFESSOR G. E. CONDRA, of Nebraska: Yes, Mr. President.

PRESIDENT FOWLER: I want to give Professor Condra an opportunity to speak to us. He is president of the National Association of State Conservation Commissions, and he has a statement to make to the Congress, if he will come to the platform.

Address by
Prof. G. E. Condra
of Nebraska

Mr. Chairman, Ladies and Gentlemen: I do not know just what our President expects me to say, but I will speak anyway. May I have about two minutes of your time?

You have come from a good many different states, and I want to outline just briefly a movement which is now under way which will result in much good, I believe, from the state workers and the federal workers.

I wish to say that two years ago some of us came together and thought that there should be in the different states an organization which would help in calling to the aid of these people of these states all the energy, the results of investigations, the work of state engineers, of all the men in the agricultural colleges, of all the men study-

ing the various phases of industrial problems and those connected with universities, and we did organize a body, representing a non-political movement, representing men who are studying conservation problems. We met at Kansas City 100 and more strong. We met there as state men and federal men for this purpose, that is, in order that we might get together, and organize a line of work which would call the farmers, the irrigationist, all the men in developing industrial lines in this country pretty closely to the soil, pretty close to the industrial facts, pretty close to the conditions which determined industry. I want to tell you that we made progress.

Now, this was our rule. We said that those of us who were working for progress in connection with state work must stand for the following: First, a definite survey of the various states and a publication of the results from those surveys to tell the people what these states were from a physical standpoint. Do you see what I mean? I mean state workers in these agricultural colleges and those connected with the state governments should work for surveys, to give us the results of those surveys along these lines: First, the structure; second, topography; third, drainage; fourth, the soil; and, fifth, the local climate. Every man here concerned with irrigation knows that the time has come, and it should have come earlier than this, when we should have definite knowledge relative to these matters.

I can take the time to tell you that it is worth our while to spend a little on these things; that it is worth our while to recognize the efforts of a man who does go out and study his state and give his life to it; that it is worth our while when we spend money for soil surveys, that those soil surveys should be made and made accurately; that it is well worth our while to gain from these various investigations these things which affect industry.

Now, ladies and gentlemen, I ask you to stand for that kind of thing; I ask you in your respective states to recognize the Conservation Commission in your state as a unit in this thing, and I want you to recognize that there is springing up a line of industrial investigation which will result in finding the truth which underlies these various propositions. I happen to be the Industrial Commissioner of a state, and I am appealed to occasionally upon this line or that line; very likely a proposition is good, it may be that it is bad. Occasionally we are tempted to say that this thing is not what it may appear to be, but let me say this, that we in these various states must learn the agricultural truths, learn the various lines of truth underlying the industrial development, and we must develop according to those truths, and when we do so and we recognize that facts must be the basis of irrigation and all other lines of development, we are going to develop more rapidly, and we will develop more surely.

I ask you men of the Irrigation Congress to support us. I say, you men of the agricultural colleges, and I am one of you, I ask you to try and learn these truths, and I wish to say, gentlemen, you will get more value out of the services of the men who are working for the agricultural colleges if they will dig into these matters, and, furthermore, they cannot learn these things unless they have done the work of investigation.

My plea is for unity in these lines of investigation, to the end that the things that we learn that are worth while may be used in the work of development as soon as possible. I thank you, Mr. Chairman, and I thank you, ladies and gentlemen. (Applause.)

PRESIDENT FOWLER: I will call your attention to two things: First, that Mr. Maxwell speaks early to-morrow morning, and I trust that you will all have read the bill and will be familiar with it and will be prepared to listen to Mr. Maxwell and the discussion which will follow.

Later in the session, in the afternoon, Mr. William E. Smythe will address you. Also the Credentials Committee will begin to report to-morrow morning. The business of the Congress cannot well be carried on, so far as the voting is concerned, until we know who are the delegates and who have filed their credentials and the Credentials Committee has passed upon them and made its report. So we hope to have a report from this committee early to-morrow morning, and in connection with that I would urge every delegate here who has not registered, to register. Do not forget to register to-night.

A list of the appointees of the different delegations has been handed in to the Secretary, and I will ask the Secretary to read it; and if there are any here who do not know they are on the committee they will be notified in that way.

There will be a meeting of the Committee of Permanent Organization and Committee on Resolutions, and that announcement will be made after these names are read.

Secretary Hooker here read the list of the various state committeemen, which will be found immediately preceding the respective committee reports.

PRESIDENT FOWLER: The Secretary will announce the meetings of these different committees; one or more of them are in session now, having just commenced.

SECRETARY HOOKER: The Committee on Resolutions is now in session in the room on the balcony floor over the entrance to this hall. I am also requested by that committee to announce that the next meeting, following the one now in session, will be this evening at 8 o'clock in Room 1509 La Salle Hotel.

The Committee on Permanent Organization meets at 5 o'clock in a room over the Registration headquarters, in the lobby of the Auditorium Theater.

PRESIDENT FOWLER: Gentlemen, you have now heard the appointments and you have heard the time of the meeting of the different committees. Those who have been selected to serve upon the different committees are requested to meet with their respective committees and aid in the work of the committees so far as they may be able.

There being nothing more to come before this meeting, I would again remind you of the informal reception at the Art Institute this evening, given by the Chicago Board of Control to delegates and guests of the Congress.

This concluding the business to come before the Congress at this session we will stand adjourned until to-morrow morning at 9:30.

Whereupon an adjournment was taken until Thursday, December 7, 1911, at 9:30 o'clock a. m., in the Auditorium Theatre.

SIXTH SESSION
THURSDAY, DECEMBER 7, 1911
9:30 o'clock A. M.
AUDITORIUM THEATRE

PRESIDENT FOWLER: The Congress will please come to order. The invocation of the morning will now be given by Bishop Samuel Fallows of this city.

Invocation by
Bishop Samuel Fallows
of Chicago

We thank Thee, O Lord, the giver of every good and perfect gift, for this goodly land Thou hast given us. We read in Thy blessed word that the precious things put forth by the sun and the precious things put forth by the moon, the chief things of the lasting mountains and the precious things of the eternal hills are ours. Thou hast said that pools of water shall become dry land, and the parched ground shall become a pool, and the thirsty land springs of water, and instead of the thorn shall come up the fir tree, instead of the briar shall come up the myrtle tree.

Now may Thy blessing rest upon these Thy servants in the consideration of these great questions which are before them, which are so vitally related to the best interests of the nation. Give them the spirit of peace, of unity and of concord. Guide them in all their deliberations by Thy Holy Spirit, and all praise shall be ascribed to Thee, Father Almighty, world without end. Amen!

PRESIDENT FOWLER: The Chair has been surprised and somewhat grieved at some of the newspaper reports that have been given of these meetings, in one respect. I hold in my hand a clipping from one of the papers this morning, of the same character as the one yesterday morning, and it seems after the address of the President Tuesday, with its kindly references to the swamp land drainage movement, the kindly acts of the Executive Committee and the Board of Governors and of the Program Committee, who have been personally and collectively in favor of the swamp land drainage movement—anyone who was here on Tuesday and heard the President's address and his remarks as he was making the address extemporaneously, could not have interpreted it in any way but as representing the kindest feeling and a decided interest in the great swamp land movement. I want to read to you a couple of sentences, and that is all.

If there is a single individual in this hall that can say honestly and truly that these statements are accurate and correct, then his ears and his imagination are far better than mine.

"Sectionalism was rampant at the meeting of the National Irrigation Congress in the Auditorium yesterday morning. Trouble has been brewing for a long time between the 'wets' and the 'drys,' and the delegates from the West, whose one aim is to secure more government money for irrigation. Impassioned appeals to the delegates to forget sectional spirit and work together for the common good were made at the meeting."

Did any of you hear impassioned appeals in connection with the

swamp land drainage movement in its relation to the Irrigation Congress or the irrigation movement?

"The climax came when E. T. Perkins, president of the American Reclamation Federation, arose and announced that hereafter the reclamation interests would take no part in irrigation meetings, but would form an organization and hold an annual congress of their own."

The Chair has been pretty faithful in his attention to the duties of his office, but he has failed to hear anything of the kind.

Then in an interview, Mr. Perkins says: "This Congress is essentially a Western affair and has little interest in the welfare of the rest of the United States. This is the first and last meeting of the Congress which will ever be held in the East."

And finally: "The delegates to the Congress have been disappointed at the failure of many of the announced speakers to appear. Ex-Governor Pardee of California, Senator Borah, Senator Newlands, Secretary Fisher and Dr. Newell all sent regrets."

That is true. That is the only true statement that I know of in the whole article, and I feel like relegating the party who inspired or who wrote this article—either relegating or nominating him for a member of the Ananias Club. (Applause.)

The first thing on the program this morning is the address by our friend, George H. Maxwell, on "Irrigation and Prosperity," I suppose, as that was the subject of Senator Newlands' paper. (Applause.)

Address by

George H. Maxwell

Executive Director Pittsburgh Flood Commission

IRRIGATION AND PROSPERITY

Mr. President, Ladies and Gentlemen: "Irrigation and Prosperity" is a pretty good topic. I believe that no one single cause of the prosperity of this nation to-day is responsible directly and indirectly for a larger proportion of it than irrigation. Mr. Devine suggested yesterday that he doubted whether the people of this country fully realized the importance of this great question of irrigation. I think we may say, beyond question, that they absolutely fail to realize its importance. If the importance of this question were realized it would not make any difference whether you held the National Irrigation Congress in Portland, Maine, or Portland, Oregon, in St. Paul, or New Orleans, you would need an auditorium that would hold 20,000 people at every session to seat the people who would be in attendance at these congresses.

If my good friend, Mr. Fowler, had been working to awaken an interest in National irrigation around this neck of the woods here in Chicago as long as I have, he would not worry very much about this convention not being any larger than it is. I don't mean by that, that he has not known Chicago longer than I have, because he was in business in Chicago at one time, but he has not had as long an experience as I have had in trying to get the people of Chicago interested in national irrigation without success. The Chicago Irrigation Congress, which was held here in 1900 or 1901, was a good deal more poorly attended than this Congress, as I remember it, but we broke into the East at that Congress and got the ear of the eastern people by coming to Chicago.

The first suggestion that this Congress should be held in the East came from Dr. Clark Gapen of Madison, Wisconsin, at the Phoenix Irrigation Congress in 1896. The plans for the Chicago Irrigation Congress were made on the train after we had all left Phoenix at the close

of that Congress. It took us three years to organize strength enough to feel safe in bringing the Irrigation Congress to Chicago, and when we got here we found it an impossibility to develop an attendance. The fact that we were going to irrigate, as we contended, a hundred million acres of arid land that would be tributary to the trade channels of Chicago failed to jar the Chicago business men loose from their daily jobs, and they did not attend that congress any more than they have attended this one. But "failures are but the pillars of success." The failure of the first Chicago Irrigation Congress helped as much as anything to bring about the success of the National Irrigation Movement as a whole; and I want to say to you right now that if you will consider the conditions that are right before you, and rise to the higher opportunity and higher sphere of accomplishment that are within your grasp to-day, that this second Chicago Irrigation Congress will mark the inauguration of a greater final success ten times over than did the Chicago Irrigation Congress in 1900. (Applause.)

While I am talking about Irrigation Congresses I want to make a correction and have it go into the record at this time, because, I take it that the records of this Congress will be published, and the Irrigation Congress is too important a body to have any defects in its history recorded and not corrected.

I hold in my hand a sheet from the Irrigation Age, the month and year not appearing, but it is page 1065, in which is given a list of the Irrigation Congresses from 1891 to 1911.* It is there stated that the president of the Fifth Congress at Phoenix, Arizona, which was in 1896, was Mr. C. B. Boothe of Los Angeles. That is correct. It is immediately afterwards stated, however, that the president of the Sixth Irrigation Congress, which was held in 1897 at Lincoln, Nebraska, was Joseph M. Carey of Cheyenne, Wyoming, which is an error. I am sure that no one would desire more than Judge Carey himself, now I understand the Governor of Wyoming, that that error should be corrected. The president of the Lincoln Irrigation Congress held in 1897 was Mr. C. B. Boothe of Los Angeles, who was re-elected president, and presided at the Lincoln Congress.

If my information or recollection is correct, the system of electing presidents was changed at the Lincoln Congress to the last day of the session, the custom having previously been to elect at the beginning, and at the close of the Lincoln session, Judge Carey was elected president and presided at the Congress, at Cheyenne, in 1898, just as Mr. Fowler was elected at Pueblo to be president of this Congress; and this Congress on the last day of its session will elect the president of the next Congress. So that Mr. Boothe served two consecutive terms as president of the Congress, to wit: at Phoenix, Arizona, and at Lincoln, Nebraska.

That fact is important to you all from a historical point of view, because at Lincoln, Nebraska, the Irrigation Congress came as near flickering out and passing into "innocuous desuetude" as any organization ever did in the world, and if it had not been for the loyal determination of a little handful of not more than a dozen of the old war horses and stalwarts of the irrigation movement in the West, the National Irrigation Congress would have died then and there. But those men at Lincoln determined that it should not die, and the very fact that it came so near dying put new determination and new fire into their blood, and the next year they went to Cheyenne, and the following year with renewed activity they went to Missoula, and from Missoula to Chicago, and from Chicago to Washington, and then back West, with a fund for National Irrigation that has amounted to-day to \$60,000,000. I well remember the times when my good friend, Mr.

*This list was taken by the Irrigation Age from the Official Proceedings of the Congress. Correction has been made in this volume.

Fowler, and I used to walk the streets of Washington wondering how we would overcome this obstacle and that obstacle, but they were finally overcome.

If anyone to-day thinks that this new and larger proposition we are talking about now is intangible or visionary or impractical, or too big to get, I want him to bear in mind this fact, which Mr. Fowler will recall, and bear me out in the statement: that the first mass-meeting that we held in Phoenix, Arizona, to try and get the people there interested in the idea of the government building that great reservoir on the Salt River, was attended by hardly more than two dozen people, and the next morning the daily paper came out with a two-column editorial abusing me for being a visionary dreamer and coming there to mislead the people with a scheme too foolish to be seriously considered. To-day the Salt River reservoir is a completed fact and that splendid dam, 235 feet above stream level and 900 feet across the top, holding back a lake 15 miles on one wing and 12 miles on the other, is there for anyone who thinks it is a visionary dream to go and butt his head against, and see whether he doesn't find something there very tangible. (Applause.)

Now, I have taken too much time perhaps with reminiscences. I have a proposition to lay before you this morning that I believe is of larger importance to more sections of the country, and to more people, of larger importance to the future development, growth and prosperity of this entire nation, than any other question that is now before the people of the United States, because it involves the question of whether or not we shall continue through all the future years to have a country.

If anyone believes that a country once fertile, beautiful, productive, and densely populated cannot be absolutely and completely destroyed, he should go to the plains of Mesopotamia. In that Land of Desolation to-day the jackal and the hyena, and other wild beasts of the desert, are the only living beings met by those who cross it along the route on which the Emperor Alexander marched his army from the Hellespont to the Hydaspes. That great multitude of men were fed on that long march from the fertile products of a fertile country, which to-day is barren desert, alkali swamps and shifting sands. We are on the very edge of such destruction as that over a vast area in this country if we do not heed the lessons of the past, and the laws of nature which control with an inexorable rule the affairs of men, and which we must obey.

If I had been asked to select from the Good Book a text for my sermon this morning I would have chosen that verse of Proverbs: "Where there is no vision the people perish, but happy is he that keepeth the law." Let us understand that last reference. It means that we must work in harmony with the great laws of nature in order to achieve happiness; in fact, in order to continue existence upon this material world.

Now, what are the conditions that face us to-day? I am very glad that Mr. Fowler referred to the fact that it has been announced in the papers that there was a split in the Irrigation Congress. I did not understand there was anything said here yesterday that gave the slightest foundation for such a statement. Each section has its peculiar and important local problems. The work of the people at large who form these organizations should be, not to necessarily merge them all in one organization, but to bring about a complete harmony of purpose, a clear, specific objective that fits and harmonizes with the needs of all localities, and when that is done, then the work of one helps the other instead of detracting from each other's efforts. (Applause.)

Let me give you some very remarkable facts. I hope, Mr. President, that I am not trenching too much upon the time of this Congress in taking more than twenty minutes this morning, because, my good friends, I have something to say to you that is of supreme importance to you.

Talking about this question of "sectional split": Away back in 1898 the Pittsburgh Chamber of Commerce passed a resolution and sent it to the National Board of Trade at Washington, which met there in December, 1898, advocating government reservoirs for navigation, for irrigation, and for flood protection. Mark you, that was in 1898; and that was what Pittsburgh did then, thirteen years ago. The National Board of Trade received from the Pittsburgh Chamber of Commerce at that session in December, 1898, a long report, prepared with the most elaborate care, by engineers of national reputation, advocating the very policy that was afterwards embodied in the National Irrigation Act.

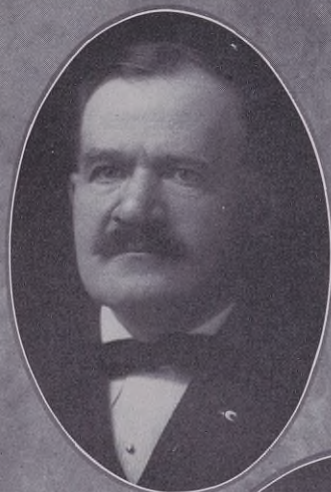
The Pittsburgh Chamber of Commerce supported the National Irrigation Movement from start to finish. The Pittsburgh Chamber of Commerce supported the Appalachian National Forest Movement from start to finish. They did both without any thought that they were working for something that was of special local benefit to them, or at least if they thought of it, in either case, it was so remote that their minds were centered on the advancement of the West, or the advancement of the Appalachian region, without any thought of the immediate application of the benefits to themselves. But in March, 1907, and in one year and five days, thereafter, they had three floods in Pittsburgh that wrought a direct damage to that city of over six million dollars, and nobody knows how much indirect damage, because you could not calculate it.

You may form some idea of the magnitude of the floods on the upper Ohio, when I tell you that in three days, in one flood, in March, 1907, there was more than enough water ran past the city of Pittsburgh and down the Ohio river to flow over the plantations of Louisiana, Mississippi and Arkansas, to fill the great National Reservoir on the Salt River in Arizona full to the very brim. A few floods like that in Arizona would be a pretty good thing to have. The more you had of them the better off you would be, if they were from the watershed above the dam.

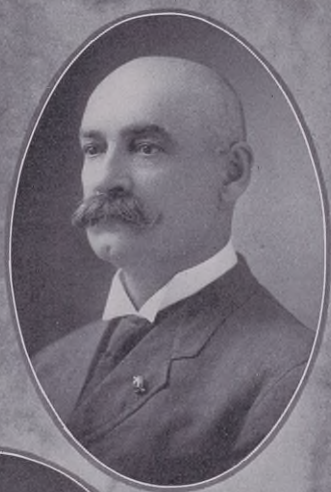
I am reminded by that thought of a little incident that happened out at the National Irrigation Congress at Missoula. I was sitting on the porch of the hotel one morning, and my dear friend from Redlands, Scipio Craig, whom some of you will remember, came up looking very unhappy. I said, "Scip, what is the matter?" "Oh, George," he said, "I am sick." "Well," I said, "what's the matter?" "Oh," he said, "I am feeling very bad." "Well," I said, "what's the matter with you?" "Well," he said, "I have been out there for an hour leaning over the rail of that bridge watching that beautiful stream that runs through this city run to waste and thinking what I could sell it for if I had it at Redlands."

Now, the point to this Pittsburgh situation is this: When we were struggling and fighting and praying for help in Washington, before the National Irrigation Act was passed, and before Senator Carter talked the River and Harbor Bill to death; when we were basing all of our efforts for relief upon appropriations in the River and Harbor Bill to build reservoirs in the West, we never thought of such a thing as looking to the East for help, on the ground that it would directly help them. That did not occur to us. We asked them to help us because the development of the West would make markets for them, and we got their help on that ground.

Within the last two years, however, since those great floods on the Ohio River that I have told you about, the business men of Pittsburgh, and the City of Pittsburgh, and the County of Allegheny, have raised over \$100,000 in cold money, and have hired corps of surveyors, and sent them out over the watershed, and have made a complete survey of the whole watershed of the Allegheny and the Monongahela rivers above Pittsburgh, an area of 19,000 square miles of land; they have



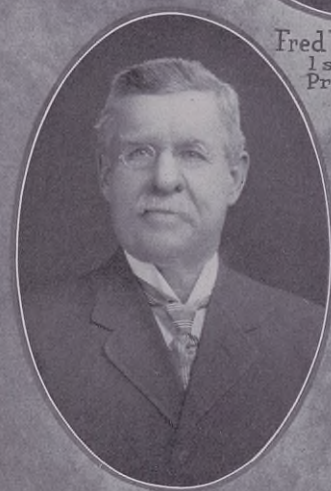
L. Newman
2nd. Vice
President



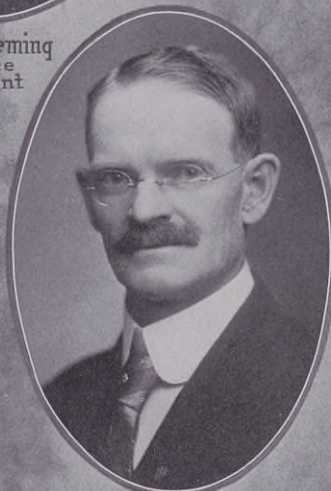
A.G. Watson
3rd. Vice
President



Fred W. Fleming
1st. Vice
President



John Fairweather
4th. Vice President



B.C. Buffum
5th. Vice President

VICE PRESIDENTS
Nineteenth National Irrigation Congress

surveyed 43 reservoir sites; they have selected 17 which they call the "Seventeen Selected Projects," which have been chosen because they give the maximum of protection for the minimum of cost, and they have discovered that for less than \$20,000,000 they can reduce the floods at Pittsburgh 10 feet and make Pittsburgh absolutely immune from floods.

Now, I am here to-day to say this to you: It has been my peculiar satisfaction and pleasure to be the Executive Director of the Flood Commission of Pittsburgh for more than a year past, and I can tell you that I just fold my arms and feel mighty good when I meet with those Pittsburgh manufacturers and business men and hear them arguing in favor of reservoirs to be built by the national government to regulate the flow of the rivers, and think of the days when we used to be down in Washington trying to get that very policy inaugurated, with only one-tenth of the whole power of the House of Representatives our way, and failing every time because we did not have the support of the East.

Now, my good friends, don't mistake this present situation. Pittsburgh can build every reservoir they need to protect Pittsburgh from floods without any help from any other part of the country beyond the city limits of Pittsburgh. Now, don't make any mistake about that. Pittsburgh isn't begging help from anybody, but the Pittsburgh Flood Commission backs me up in this position, officially, and in their report which is now being printed, which, when it is completed, will comprise 700 pages of matter covering every single aspect of this whole flood question, historically, and in every other way, in this country and in other countries, with over 135 maps and innumerable statistical tables and data, and they in that report declare this to be their position: that what they stand for is the co-operation of the national government, of the state government, of the counties on the watershed and of the city of Pittsburgh in working out that great problem. They at least see, if the people on the lower Ohio and the people on the lower Mississippi do not as yet see, that the floods that pass Pittsburgh run to the Gulf of Mexico and it may be that the same water that overflows the plantations in Louisiana came from the hillsides or the mountains on the watershed of the Allegheny or the Monongahela Rivers. They are ready to stand behind a great National River Regulation Movement which will commit the government of the United States to a national policy of flood water storage which, in its ultimate accomplishment, gentlemen of the West, will store every single drop of water that now falls and goes to waste west of the 98th Meridian, a policy that will check and control the floods of the lower Mississippi valley, and hold them back in the times of high water, when they now do down there carrying with them death and destruction, and put those waters into the great Father of Waters, in the lower valley, in the summer season, when they need it to float boats on. (Applause.)

With all the great industrial interests that center in Pittsburgh standing for that policy, I ask whether the West can afford to lose the opportunity that is theirs in this session of Congress, to back up that movement in such a way that it will be recognized, when these reservoirs on the Allegheny and the Monongahela are built, that we are launching a national movement that will store all the flood water of the country for beneficial use, and create national benefits beyond the power of the combined imagination of all the minds of this country of 80,000,000 people to estimate what it would mean in national prosperity and in national wealth to the people of the United States.

Why, they talk about a division between the irrigation forces and the drainage forces! You can no more separate and divide them than you can change the law of gravitation, and make water naturally run up hill. (Applause.) The people of Pittsburgh, with their Flood Commission, which has shown its vitality and the tremendous power that

is behind it in raising in two years \$100,000, and making a great survey of all that country that would have taken years and years to complete, if it had been left to slow governmental processes, have formed their own organization, of course. They couldn't leave it to the National Irrigation Congress to run their job. You of the West, who want the West reclaimed and the water put upon the deserts in order that they may bloom and blossom, can't leave your job to the people of the lower Mississippi Valley or the people of the Ohio Valley, and no more is it in my judgment desirable, either from the standpoint of the people of the lower Mississippi Valley, or from the standpoint of the West or the Ohio Valley, that the people of the lower Mississippi Valley should merge entirely their campaign with ours.

They need a drainage organization to harmonize the influences through which that great problem has got to be worked out. They must have their Flood Commission in the Ohio Valley for the same reason that you must have your Irrigation Congress. Let that Congress be, for that seems to have been decided to be best, a western organization, working in harmony and in close alliance with those other organizations that are working toward the only solution that will ever accomplish the reclamation of the rest of the West.

Some suggestions were made yesterday, that the western people were going to Washington at the coming session of Congress to assert their demands for a larger share of the fund that is being spent under the National Irrigation Act, for this state, and that state, and that state. Now, my good friends, don't waste any of your energy quarreling among yourselves about the division of something you have already got. If you will put that same energy into the great national movement for the Storage Reservoir policy that we started in for in the National Irrigation Movement twelve years ago, you will have enough to cover everything, and you won't have anything to quarrel about, because you will all have enough.

Now, take this question of water, looking at it as I always think of it, a vast national problem of River Regulation. I wish that I could in some way instantaneously transmit from my mind to yours a vision that is now in my mind, and that was in my mind when I quoted that verse from Proverbs, "Where there is no vision the people perish." On one of my western trips, some years ago, I crossed the Mississippi River, from New Orleans, on a ferry boat that carried on its deck the trans-continental train that was going from New Orleans to Los Angeles and San Francisco. The river was so high that as we stood upon the deck of that steamer and looked across to either side towards the levees, you couldn't see a single vestige of a levee either way, on either side of the river.

PRESIDENT FOWLER: The gentleman's time has expired. What is the wish of the Congress?

JUDGE FAIRWEATHER: Mr. Chairman, I move that his time be extended as long as he wishes to speak.

The motion was seconded and carried.

MR. MAXWELL: I thank you, Mr. President, and I thank you, gentlemen of the Convention, because I do feel that I have something to say to you that I ought to say while we are all here, and get it before you, and it is such a tremendous problem, and reaches into so many different ramifications of sections and questions, that you can't boil it down and make it clear in a twenty-minute speech.

Let us go back to the ferry boat on the Mississippi River. The New Orleans papers were filled that morning with great headlines and stories of that appalling flood, and the fear was in every man's heart in the city of New Orleans that that flood would break the levee on

the New Orleans side and cause a disaster in New Orleans that might cause the loss of millions upon millions of property and nobody knows how many hundreds or thousands of lives. But Providence was merciful to them, because before we got up the next morning and saw the morning's papers, that flood had broken the levee on the other side of the river, and hundreds, yes, thousands of acres of land were overflowed and the plantations destroyed, on the western side of the river, but the city of New Orleans was saved.

Now, my friends who are here from the lower Mississippi Valley, I want to call your attention to some things. Bear in mind that that flood came from a watershed that extended from the State of New York, the State of Pennsylvania, the State of Maryland, and the State of West Virginia on the east; from Canada on the north, from the Crown of the Continent in Montana on the northwest, and from the crest of the Rocky Mountains all the way down, until you reach the line of the southern boundary of the drainage basin of the Mississippi River on the west. As I looked over the deck of that ferry boat, one drop of water that was under my eye may have come from New York State, another from West Virginia, another from Canada, another from Montana, and another from Colorado. All the surplus water that falls over that enormous watershed, which embraces more than one-third of the whole United States, must find its way to the sea past the city of New Orleans, past the wonderfully rich and fertile plantations that line the banks of that great Father of Waters, all the way down through the Sugar Bowl of the Continent.

Now, my good friends from that country, when a great flood comes to-day and overflows your plantations, it is not the serious matter that it will be when the day has come that you are praying for and working so earnestly to bring about, when those bottom lands on both sides of that great river are all drained and cut up into small five and ten acre garden farms, with a family on every one of them. I ask you what it will mean to you when that time has come, and we have reached the point in this country that they have reached on the Yellow River in China, where the levees, through hundreds of years, have been constantly raised and raised and raised, until the bed of the river has risen to be higher than the plains on either side, and there is no possibility of controlling those great floods, and when they break the levees, they run out over thousands of square miles of country, and millions of people are involved in famine and death, and the world is appealed to for help, simply because of the floods. And China has not yet reached the last stage, that comes from flood destruction.

I received last month from Mr. Charles D. Walcott, Secretary of the Smithsonian Institution, a copy of a pamphlet recently published by that institution containing a paper by Sir William Willcox, describing the work that is now being done to reclaim again for human use and habitation the plains of Mesopotamia, that once were so densely populated that they supported the city of Babylon, and which are desert wastes to-day.

The author says in this pamphlet that the final cause of the destruction of that country and of that enormously dense population was the gradually increasing floods which made it impossible for them to protect their irrigation works against them, and at last the complete destruction of the irrigation works was caused by floods, and the country was depopulated and abandoned.

What was the condition of the water shed of the Mississippi River, including the Ohio and the Missouri, one hundred years ago—and that is only one century—it is only a moment in the great cycles of time that make and unmake Nature's work. It is only a day in the history of a nation. A hundred years ago, Ohio, Indiana and Illinois were densely forested or vast swamps. To-day the forests are gone, the swamps are drained, and tens of thousands of square miles of arable

land is tile drained. Go up into northwestern Wisconsin and Minnesota. I spent six weeks in that country last fall and I saw something that surprised me, and that I never realized before, that the whole northern part of Minnesota is a great natural reservoir, formed by immense areas of swamps. It is a huge sponge that held back a great quantity of water so large as to be beyond calculation or estimate, that fell in the form of snow and rain, was absorbed by that great sponge, and at last found its way by natural seepage gradually into the Mississippi River in the summer months, so that it kept up the flow of that river at a point that made it navigable clear through the year; when to-day, if you watch the daily papers, you will find the summer flow of that stream is dropping, dropping, dropping, and the reason is the one I have told you.

My good friends from the South have voted to grant those swamp lands to the state of Minnesota, and the state of Minnesota is carrying out some of the most stupendous schemes of drainage that are being carried out anywhere in the world. Tens of thousands of acres of natural reservoirs are being drained and turned into fields and gardens of fertility that you can hardly describe or realize. But what does it mean to the South? It means that the water that once went into the river in July and August now runs in almost instantly after it falls, to join the water that runs off of the farms of the Ohio River Valley, like water runs out of a rain spout whenever there is a heavy rainfall.

Then go across the Mississippi out into the West, and what do you find? You find that in the days of Lewis and Clarke, in the days of 1803, for instance, when Chicago was nothing but old Fort Dearborn—a hundred years ago there was nothing here but a fort and a few straggling log houses—the whole West, all the great country that the buffalo ranged over, was covered with sod or with a dense growth of Buffalo grass or bunch grass. There are many from the West here to-day no doubt who remember the time when that great mantle of grass and roots covered the plains of the West, and it was a natural check to the rapid running off of the rains that fell over millions of acres which is now as bare as that floor, from which the water runs off to-day as fast as it falls from the clouds, without any of the checks or hindrances that were originally created by nature.

I have not touched the forest question in the West, I have not touched the forest question in the East, but the constant process of forest denudation is going on everywhere, increasing the suddenness of the run-off into the streams. Now, again I turn to my friends of the lower Mississippi Valley and I ask them if they are ready to face the responsibility of this constant change that civilization is bringing over this great watershed that furnishes the water for the river that drains past their cities—if they are willing to take the responsibility of the future and say that they should drain and settle those rich bottom lands with millions of small garden homes and farms where people can go and be as prosperous and happy as they can in that country, without coupling the drainage of that section with a great movement to control and safeguard against the floods, and hold them back in the country where the rain and snow originally falls, instead of having the flood water go down into the lower Mississippi Valley with a force as irresistible as that of the falls of Niagara going over the precipice from which they fall into the gorge below.

Why, if this process continues without a great national policy of protection for those lower river lands, you might as well expect to check the floods that will flow over them in fifty years, or in less time, with levees built for local protection, as you might expect to-day to sail up to the base of Niagara Falls on the Maid of the Mist, and with a flashboard in your hand, push back the torrent that comes over those falls.

There is something so appalling, something so absolutely beyond

all human control, about the great floods on the lower Mississippi River, that I have never been able to understand why it is that the people there have not yet awakened to the possibilities of a great national movement that would protect them as absolutely from danger from floods as we are protected here in this building to-day.

Let me give to you, and through you let me give to them, because I hope that those who are here to-day will carry the word back to Louisiana and to Arkansas and to Mississippi a new thought in regard to National Irrigation. Has irrigation nothing to do with drainage? Let us see. In the single state of Montana it is estimated that there are eight million acres of land capable of reclamation. In the Missouri River Valley above Kansas City there are more than twenty million, probably more than forty million acres of land that could be irrigated if the national policy that I am advocating here to-day were absolutely and unqualifiedly adopted and fully carried into operation. Now, suppose that you only irrigate ten million acres of it, and select those lands carefully and judiciously where it will best serve the purpose of a great sponge to absorb the waters that would otherwise come down the Missouri River in floods, and soak that water into the cultivated fields, so that it will yield crops and produce wealth, create communities and increase our national prosperity and greatness, and what will you do?

Two acre-feet of water soaked into one acre of ground is none too much for the ordinary farm irrigation of that country. Two acre-feet of water soaked into twenty million acres of land; taken out in great flood water canals and stored in reservoirs and then used for irrigation and soaked into the ground, into Mother Earth as a reservoir, will store—mark it now—enough water to cover 31,250 square miles of land with water one foot deep. I beg of you to follow my figures closely, because right there is one of the solutions of that awful danger from floods in the lower Mississippi Valley. 31,250 square miles covered with water one foot deep will cover 3,125 square miles with water ten feet deep. If you broaden it out to three miles wide, instead of one mile wide, you have a belt of flood three miles wide, a thousand miles long and ten feet deep. In other words, if the policy that I here and now ask you to adopt and work for—do not go away with the idea that all you have got to do is to pass a resolution and let it go at that—resolutions don't amount to that (snapping fingers)—if you catch the inspiration of this great idea, take it home with you and work for it, and work for it, and work for it, until you get it done, your work will amount to something. If the policy I now ask you to work for were adopted, it would store in the Earth Sponge Reservoir and thereby hold back water enough to make a flood from the city of New Orleans to the city of St. Louis ten feet deep and three miles wide. There is a thought for you! There is a fact for you! Anybody in the lower Mississippi Valley might look up that river and realize what it would mean to fill that river with water three miles wide, ten feet deep and a thousand miles up the river; and yet, my good friends, that is just exactly the amount of water you would use in Montana and North and South Dakota, and Kansas and Nebraska and Colorado and Wyoming, that would come in times of high water floods, that you would hold back and carry out into reservoirs, and into great flood water canals, and which would give you two acre-feet to irrigate each farm, if you irrigated only ten million acres, which is about one-fourth of the total area irrigable in the Missouri River Valley.

Will any gentleman from Chicago, in the face of those facts, tell me that there is going to be a split between the irrigation forces and the drainage forces? I rather think not. I do not believe that the advocates of a national drainage policy in the lower Mississippi Valley would be willing, if they had to choose between the two, to say that they should have drainage and take the risk of these floods, unless you

could in addition to drainage have irrigation in the Missouri River Valley, and protection from floods in the lower Mississippi River Valley. Haven't I united the irrigation and the drainage interests there? Haven't I shown you that they are "One and Indivisible?" I think I have, and I think the more you think about it, the more the people of the whole lower Mississippi Valley think about it, the more they will realize it to be true.

Let us take the other prong of this triangular proposition. Captain Chittenden in an elaborate report which was transmitted to Congress in 1897, made this statement, which is so striking that I commend it at this time to my friends from the lower Mississippi Valley, and ask them to carry it home with them and bear it constantly in mind:

"The floods of the Mississippi * * * are formed by the heavy rains in the low regions east of the 98th Meridian, and very largely come from east of the Mississippi itself. The great controlling element, in fact, in all the lower river floods, is the Ohio River."

Do not misunderstand this proposition. Captain Chittenden says that the great floods of the lower Mississippi Valley are caused only by a combination of high water in the Missouri and the Ohio, with possibly higher water in the Mississippi at the same time. Unless you get that combination of high water in more than one of those three rivers, you have no danger of a destructive flood in the lower Mississippi Valley.

Now, there is no doubt of the fact that you can control the Missouri River above Kansas City, so as to remove all danger of a flood in the Missouri sufficient to join with the Ohio and do any damage. But you can make assurance doubly sure. You can safeguard yourself against flood destruction in the lower Mississippi Valley absolutely, if you combine with the control of the Missouri River the control of the floods of the Ohio.

The Flood Commission of Pittsburgh has ascertained that sufficient storage exists on the headwaters of the Ohio River to control the floods of the upper Ohio, and the same conditions undoubtedly exist as to the whole Ohio River provided the work of flood protection and prevention is done as part of a great national policy of river regulation, and made comprehensive enough to practically regulate the flow of the Ohio River, taking off the high crest of the flood in the winter and spring, and putting it into the river in the summer when it is needed for navigation.

With those two facts confronting the people of the South, there is no possibility in my mind at this time of a conflict between the irrigation interests of the West and the flood prevention interests of the upper Ohio Valley, but they must make a great national campaign that will include, as the resolution of the Pittsburgh Chamber of Commerce in 1898 did include, irrigation, drainage and flood prevention by reservoirs, all combining to help navigation, and bring the whole question within the constitutional power of the United States.

What does this mean to the West along another line, which is of great importance? The National Irrigation Act was passed for the purpose of getting us off the River and Harbor Bill, and when it was passed things were put into it which the best friends of that bill never approved. If this idea of National Irrigation were worked out as it should be worked out, the reservoirs, the dams and diversion works on the tributaries of the navigable streams should be forever retained in the ownership of the National Government, as government property, just as the great dams and irrigation works in India are forever to be owned and operated by the British Government. The way that would work out would be, for instance, in the Salt River Valley, the great reservoir and the dam creating it would remain the property of the government forever, and the people of the Salt River Valley would not be assessed to pay back that money to the government, but

would only have to pay an annual charge equal to, we will say, three per cent on the total investment. They would repay only the cost of the Distributing System. The same would be true of the Pathfinder dam on the North Platte River. The same would be true of the Shoshone dam, and all other similar works.

It has been suggested by the president of this Congress that the time should be extended for making the payments required for carrying out the provisions of the National Irrigation Act. I want to say to you that the best friends of that bill in Congress when it was passed realized that ten years was too short and believed that it would not work out in that time. Twenty years was the period we then advocated; but we were up against that stupid idea, that you have got to develop this country without spending any money, or if you spend any money, you have got to get it back, and get it back quick enough to keep it coming and going out, coming in and going out, in a few years time, and in that way reclaim the West in a few years with this revolving fund. That cannot be done; it never will be done.

If this country can afford to pay four hundred million dollars to cut a canal across the Isthmus of Panama, I maintain they can afford to pay fifty million dollars a year for ten years to regulate the flow of every river in the United States, to reclaim for human use a hundred million acres of arid land of the West that remains to be reclaimed, and the seventy or eighty million acres of land that needs to be drained, in order to be made fertile and productive, because when you have done that, you not only have added all that area to the agricultural wealth of this country, but you have solved the forestry question, and at the same time you have solved the question of navigable rivers, and you cannot solve it in any other way.

The last regular session of Congress appropriated about \$1,025,000,000 for the purposes of this government, and if we cannot spare \$50,000,000 more so as to change that \$25,000,000 to \$75,000,000 and make it \$1,075,000,000 in one year, why, we had better go home and burn our clothes and go back to the time of the bush men, or go out in the morning with a club and kill a snake for breakfast, because we have not brains enough in this country to run it. (Applause.)

That is what those ideas that have been embodied in the Newlands Bill* mean to the West, that is what it means to the South, that is what it means to the great Ohio River country, and I am not going to take up your time to-day with any more details with reference to the various things that might be done under this bill. Every delegate here should read the bill and study its provisions. I want to tell you right here that that bill is no one man's bill. That bill was studied and every line of it gone over and every provision of it examined by pretty nearly every man in the Departments at Washington who, during the last session of Congress, was keenly and earnestly interested in this subject. My good friend, Mr. McGee, who is here to-day, was one of those who went over it. It was gone over by the Geological Survey, by the Reclamation Service, by the Forest Service, by the Smithsonian Institution. Everybody did the best they could do to prepare a bill that would cover the great needs of this immense problem, and to provide the machinery for doing that which Senator Newlands, in his telegram yesterday, stated was the thing that must be done, and which is the thing that must be done to co-ordinate and bring into harmonious co-operation these different governmental agencies.

The idea of drainage in the lower Mississippi Valley under a bill similar to the National Irrigation Act will never work out unless it is coupled with this greater plan of storing back and controlling the floods, for more than one reason. President Taft has said that the work of drainage cannot be done by the national government. Presi-

* For Copy of the Newlands River Regulation Bill, see appendix.

dent Roosevelt has said it must be done by the national government. Both are right and both are wrong. There are certain limitations in the practical working out of the constitutional power of the nation that will make it impracticable to do in this lower country what they can do successfully in the arid regions of the West. If the government shuts down the gate of the Salt River reservoir and says: "You must pay or you will get no water," you are going to walk up to settle with Uncle Sam before you get any water, aren't you? How is Uncle Sam going to collect his bill where somebody has overflowed land that Uncle Sam has reclaimed? He has got to protect that land all through the season and keep the water off the land, and then when he comes to collect, he finds he is up against the proposition that he has no legal system of enforcing the obligation, because he cannot do what the state can do, create drainage districts and levee districts, and provide for an assessment on the land, which may be sold unless the assessment be paid.

The idea of having the government take back the lands, which it originally ceded to the state, or take back the lands which have been passed into private ownership, and then go in and reclaim them, is to my mind hopelessly impracticable, but there is no doubt that under a measure like the Newlands Bill, which is before you to-day, by the co-operation of the national government making the plans and surveys on a big scale, and building the main levees and doing the things which are within its constitutional powers, leaving it to the state to form drainage districts, and to carry out the local work which must be done on the land itself, that you can work out a magnificent plan for reclaiming every acre of swamp and overflowed land in the lower Mississippi Valley, and keep it protected from floods forever.

I hardly know what to propose to this Congress as to what you might do to help pass this Newlands Bill. I do not believe there is a man in this hall that is not heartily in favor of it. No one organization can pass it, no one section can pass it, but there are in the United States to-day beyond all question enough people who could be allied and organized together to pass that bill in this session of Congress, if we could reach them and let them know about it. It seems to me that the people who are here as delegates might do this. Every one of you has a copy of that bill. Let it be understood that a list of the delegates to this Congress is to be placed in my hands as soon as it possibly can be accomplished. Let me take the matter up by correspondence with every one of you. Go back to your homes, to your home towns and your home cities and your home chambers of commerce and organizations of that kind. Go before them with the determination that every one of them shall not only endorse this bill, but talk it up and go after it with delegates to Washington and a campaign of education at home until the whole United States is organized in that way. If you will do that, and start a movement like that, before the present session of Congress is over—because this is going to be the long session—you could move on Washington with advocates from every county in the United States, who would go there with the determination to pass this bill and stay in Washington until it had been passed at this coming session of Congress.

We don't want to wait ten years for the passage of this bill. We don't want to wait until another session of this Congress or of any other Congress. We want this bill passed at this session of Congress, and there is time enough to do it.

If there is anybody in this hall who wants to ask any questions in relation to this bill, I hope he will do so, because I am ready to answer them, and will appreciate their being asked. Before doing so, however, I want to say one thing more. If there are any here who are opposed to this bill, who see any fault in it, I hope most earnestly that they will present their objections here and now, in order that they

may be answered here and now, so that not one of you shall go away with any misapprehension of the real purpose of this bill.

If any of my good Republican friends are uneasy because this bill has been introduced by a Democrat, I want you to remember two things: first, that the Democrats in this session of Congress have got the votes in the House of Representatives, and any bill in this session which becomes a Democratic caucus measure, as the National Irrigation Act became in the session of 1902 when the Democrats were in the minority, and we had to get enough Republicans to break loose from the organization in the House at that time to vote for the bill—that if the bill becomes a Democratic caucus measure in this session, it passes the house, and I have no doubt that if it passes the house, the same conditions will exist in the Senate as existed when we had the National Irrigation Bill, that the Senate will vote upon this bill in an absolutely non-partisan way, just as they voted on the Appalachian Bill in a non-partisan way; and the whole West being solid for this Newlands Bill, we will get votes enough from the lower Mississippi Valley and the Ohio River Valley from the Republican ranks to pass it in the Senate.

You may realize the importance of this bill when you consider that Montana and Idaho are as large as the empire of Austria-Hungary, and that this bill would put as many people as now populate that nation into those two states; that North and South Dakota are as large as Sweden and Norway, and that this bill would put as many people in those two states as now inhabit Sweden and Norway; that Colorado and Wyoming are as large as the German Empire, and that this bill will put as many people in them as now constitute that great Empire, because, mark you, this bill provides that the government shall hold this water back, and that means not only that it shall build the great reservoirs, but also the immense flood water canals from which the water would soak into the great plains of the West and fill them with an underground water supply in a comparatively few years, so that you could raise crops anywhere on those plains. That would be the result of this bill.

I remember on one occasion coming down out of the Sierra Nevada Mountains into the San Joaquin Valley with a man who was one of the pioneers of that country. We came down from the mountains west of Fresno, and we looked off over that country, and this man said to me: "Mr. Maxwell, when I first came into this country it was 75 to 100 feet to water anywhere, and to-day around Fresno their problem has ceased to be one of irrigation and become one of drainage." And what is the reason for that? Because, for a generation, the canals in the Fresno country have run bank full. Suppose the government would build great systems of flood water canals to utilize the great plains of the West as a storage reservoir for the flood waters, and run those canals full of water whenever there was surplus water in those rivers, in a generation you would have wheat fields growing where you never, never will get them by the ordinary processes of surface irrigation.

There are three kinds of reservoirs to regulate rivers: First, the natural reservoir, the forest, the woodland cover which checks the rainfall and pours it down into the ground to come back into the streams at a later time, when the water is needed. That is the first kind of natural reservoirs. Second, you have the artificial reservoir, such as are made by building dams and turning canyons and valleys into artificial lakes. We are all familiar with that. Third, you have the artificial reservoir that is created by filling the earth full of water over a vast area of country, soaking the water into the ground and using all of Mother Earth as a great reservoir.

If, under the Appalachian Bill the government has adopted the policy of maintaining natural reservoirs in the form of forests on

the headwaters of the navigable streams, is there any reason why they should not go a step further and enlarge the policy adopted on the head waters of the Mississippi, and build reservoirs on the head waters of all navigable rivers? And is there any reason why they should not go one step further and harness all the floods of all the rivers of the Great West and carry them out in flood water canals, and utilize all of Mother Earth over that vast area of country in the great plain region as a vast reservoir to regulate the flow of the rivers? That should be done without asking for any return from the land itself, because you cannot harness the two together on a large scale.

If the plan I am now advocating were adopted by the national government, the National Irrigation Act would provide a fund for the construction of irrigation works where there is no navigable river, as in the great interior basin, or for the construction, where necessary, of distributing systems which would eventually pass into the hands of the farmers and be owned by them, and that money would come back into the fund to do the same thing over again.

What I maintain is that this great policy of river regulation should be extended to all navigable rivers, and that where works are built to store water and regulate the flow of a navigable river, that money should not be returned by anybody to the government, any more than they ask for the return of the money they spend for any river and harbor improvement, but the work should be owned forever by the national government. (Applause.)

MR. JAMES F. PECK, of California: Mr. Chairman, I read this bill with considerable interest, and I do not want to be understood in asking this question as being in any way opposed to the general line. What I want to ask is this: The territory to which Mr. Maxwell last alluded, about Fresno, has a problem which is a little different from the drainage of the Mississippi Valley or its watershed. In this bill it provides as one of the features, the standardization, as it is called, of the flow of the streams. It is intended, as I understand, to keep a uniform standard flow in the streams for navigation.

MR. MAXWELL: So far as possible.

MR. PECK: In the San Joaquin Valley, the particular stream to which you allude, that stream to-day is drained for irrigation. The Sacramento River is also being rapidly drained for irrigation. The people in that state have concluded that it is better to take a stream that only furnished three miner's inches and use it for irrigation, than it is to float a toy boat for a child, from that up to the biggest stream that can be utilized economically, so that navigation, as was stated by a speaker here yesterday, is of secondary importance compared with irrigation in the West. Now, if that be true, then who will regulate the flow of the stream so far as to give it a standard flow for navigation? We have already taken that water out and given it to irrigation, and if you are going to standardize a stream, how far is the federal government going to say to the man who today takes out the water from a rivulet that enters into a bigger stream—how far is the government going to the head of this stream and control the little individual owner upon the higher reaches of that stream?

MR. MAXWELL: I am very glad that question has been asked, because it gives me an opportunity to bring out more clearly the principle which controls this bill, which is that the national government does not undertake to regulate any diversion of water from the river in any way at all. What the national government undertakes to do is this: only to hold back by some process of engineering works the water which would otherwise run to waste, when there is more water in the stream than all can use, and put it into the stream at the time that it is needed, and in that way provide water for all rights

which have been created under the state law, the idea being that the main use to which water can be devoted in the West, and the one which should be given precedence over other uses is that of irrigation, and that if all the water that the government stores away and makes available in the natural channel of the stream in dry seasons is taken out for irrigation, the government recognizes that as the primary object so far as the West is concerned. But you must not overlook the fact that the only constitutional power the government has is to regulate rivers primarily for navigation and incidentally for all these other uses. Under the constitutional power of the government, irrigation must be incidental. If the government should go into the San Joaquin Valley and undertake to operate under this bill, what I believe the government would do would be to build the works necessary for flood preservation, and then to build a navigable channel from Stockton to Bakersfield, and make it large enough and big enough to sail boats on at any time, and drain the valley, through that channel, and give it that which it needs the most, which is drainage, and at the same time flood prevention and irrigation as well as navigation, and it can do all that under this bill.

The idea that the government is ever going to undertake to control the diversion and use of water under the state laws is a suggestion I am glad to have brought up here at this time, to make very clear that the bill contemplates nothing of the kind. It was carefully drawn with the idea that nothing of that kind is contemplated or shall be undertaken. The diversion and distribution of the water and its use for all the beneficial uses for which water may be taken from the stream are left to be controlled by the state laws absolutely.

MR. JOHN FAIRWEATHER, of California: Mr. Chairman, I notice the gentleman who has addressed us advises us to go home and get Chamber of Commerce resolutions, but I want to ask this question, if he does not think that a letter from each one of us, and each one of us to act as a committee of one to get our neighbor to write a personal letter to all Congressmen and to all Senators, and get all the womenfolks in California, who now have a right to vote—if that would not be worth more than Chambers of Commerce?

MR. MAXWELL: Absolutely, Judge Fairweather, you are right. There is no doubt about that. It is the individual power of the individual voter that finally makes itself felt upon the congressmen, but we must have a thread running out from some central organization into all these localities, by means of which we can keep in touch with all, and in that way mass forces and bring the ammunition up and use it at the right time and in the right way. The more all of you can do individually, the better. (Applause.)

MR. A. R. SPRAGUE, of California: Mr. Chairman, I would like to ask Mr. Maxwell if the problem of drainage in the San Joaquin Valley is not practically the same as the problem of drainage in the East as it relates to the Ohio and the Mississippi Rivers?

MR. MAXWELL: I believe that to be so, and I want to say right here that every line of that bill has been written in the light of my familiarity for many years with the Sacramento and the San Joaquin Valleys, and in the belief that this bill furnishes both the money and the machinery to completely solve every question you have in those valleys with reference to floods, irrigation and drainage through the co-operation of the state and the nation and the local districts in California. (Applause.)

MR. KERN, of Texas: Mr. Chairman, I haven't any question to ask, but I happen to be here as a solitary delegate from the lower Rio Grande Valley of Texas, where we are clear beyond the pale of assistance from the government. We are spending a half million dollars as best we can and hope to secure results. I have always had some

interest in Missouri, and I want to say that I think this Congress can do nothing better than to unanimously endorse the position taken by Mr. Maxwell in his speech. (Applause.)

I came from Missouri six years ago, and we had fifty thousand acres of the finest land on earth overflowed by a little river which crossed the state from Iowa, and after persistent efforts and a long fight we raised \$400,000, dug a canal ourselves fifty miles long, fifty feet wide and fifteen feet deep, and took land that was waste land covered with wild grass and converted it into the finest agricultural land in the state of Missouri, that to-day will sell readily on the market for more than \$100 an acre; and I have seen enough flood water pass down that river, down the Missouri, down the Mississippi, down the lower Rio Grande, the wonderful lower Rio Grande Valley, to irrigate, I believe, all of the states of Texas and Missouri combined. I am glad to hear the gentleman say he wants no separation of the irrigation and the drainage interests in this Congress, and I am sorry to see so much of this matter in the daily papers of the city of Chicago.

I am in favor of standing shoulder to shoulder, and let us put our hands in the treasury and get, as has been suggested, \$50,000,000 to open these lands to the home seekers for the welfare of this great republic of ours.

PRESIDENT FOWLER: Of course you understand that the time is now past for the consideration of this question. I simply call your attention to that fact, and that we ought to crystallize something if we are going to do anything more.

JUDGE GEORGE H. HUTTON, of California: We are doing in the state of California precisely what the speaker has referred to, in the actual development of that work. I want to say that I heartily approve of the ideas which have been so ably presented here this morning, and that I shall go back home and take great pleasure in advocating the passage of the bill.

PRESIDENT FOWLER: How can any man fail to go home and advocate the passage of such a bill? It is an inspiration to think that such a bill as this has been launched, and that we can see the possibility of the achievements that are embodied in this bill, and for one, speaking for myself and as President of the Congress so far as I am authorized to speak, I believe that this Congress will stand unanimously in favor of this bill which has been so eloquently presented to us by Mr. Maxwell. (Applause.)

Mr. Perkins rises to a question of personal privilege.

MR. EDMUND T. PERKINS, of Illinois: Mr. President and gentlemen of the Congress: One of the morning papers makes the statement that yesterday I arose and announced that hereafter the reclamation interests would take no part in irrigation meetings, but would have an organization and an annual congress of their own. All of the delegates who were present know that that did not take place, and I wish to assure you that the rest of this supposed interview does not represent my statement any more correctly than that original statement. For twenty-five years my living has come entirely from irrigation. I have been raised in the National Irrigation Congress, with the belief that it was the most effective instrument for good in the United States. For the last eight months I have devoted all of my efforts to making a success of this Congress. I have worked day after day with the people of Chicago to make them support fully this Congress, and I can assure you that there is no accuracy whatever in this statement and that those are not my views in any way.

I believe the National Irrigation Congress is the greatest instrument for good along this line in the country to-day. If they should ever feel that they wanted to come back toward this section of the country, and it is possible for me to aid them in any way, I will devote myself

for an entire year to make that Congress a success as much as I have done.

The movement for the reclamation of swamp lands is not a subject which is of special interest to me at this time. My living has come absolutely and entirely from my work as a civil engineer in relation to irrigation projects, but I believe that the whole country would profit by the reclamation of all of its lands, and I believe that such a movement as proposed by Mr. Maxwell, where the forces of the West and the South work together, is a partial solution of this question. It is utterly impossible for us to divide. The suggestion has been made that a drainage association might be formed. If such a drainage association is formed, it will be formed to work with the National Irrigation Congress, not against it in any way. (Applause.) A committee meeting will take place this evening at eight o'clock, and I extend a special invitation to Mr. Maxwell and to Mr. Fowler to be present, especially to Mr. Maxwell, to give us his ideas of the most efficacious means of advancing the interests of the entire program.

Regarding the little paragraph at the bottom of this interview, when it speaks of the addresses where men sent regrets, I very much fear that the Chicago people, the Board of Control themselves, are responsible for that. We unfortunately chose a date when the National Congress was in session in Washington, and also a date when the Rivers and Harbors Congress was meeting there. We did not know of this latter event, and these gentlemen, who were all honored by invitations which they have to address this Congress, and who would very much like to come, found it impossible to leave their business.

Gentlemen, I want to assure you again that the people of Chicago are not desirous of seeing any split in this Congress. There is no such sentiment expressed on this floor, there is no such sentiment felt by anyone. (Applause.)

PRESIDENT FOWLER: The Chair is especially happy that that statement has been made, for the reason that he was astounded when he saw the statement in print, knowing it was baseless, and he could not believe that his friend, Mr. Perkins, had authorized anything of the kind. The matter is all smoothed out; it is all ironed out. You see that there is nothing but harmony between the Irrigation Congress and the swamp land drainage movement. Mr. Perkins being the president of the Reclamation Federation, at the present time, you can see for yourselves that there isn't any friction, all is unity and harmony, and the two organizations will work just as closely together as it is possible for us to bring them. (Applause.)

The next paper on the program is "The Present State of Irrigation Development and a Forecast of the Future," by Professor Samuel Fortier, in charge of Irrigation Investigations, United States Department of Agriculture.

Address by

Samuel Fortier

Chief of Irrigation Investigations

Office of Experiment Stations, U. S. Department of Agriculture

THE PRESENT STAGE OF IRRIGATION DEVELOPMENT AND A FORECAST OF THE FUTURE

Twenty years ago I had the honor of being a delegate to the first National Irrigation Congress, held in Salt Lake City. In celebrating the twentieth anniversary of this organization, it would be appropriate to pass in review the many achievements of the past twenty years in the development of the arid region by means of irrigation. The time

necessary to make a presentation of this kind and the ability to perform the task are, in my case, both lacking, and I shall therefore be obliged to confine my remarks to a much shorter period and call your attention to but a few out of many achievements.

GOVERNMENT IRRIGATION

Two branches of the United States Government have to do with irrigation. The Reclamation Service operates under the Department of the Interior in accordance with the provisions of the Reclamation Law of 1902. Under that law this Service provides water supplies for government lands and has a fund at its disposal derived from the sale of the greater part of the public land in the West. This fund is employed in the building of canals and structures for certain well defined tracts of land. It, therefore, expends large sums on comparatively small areas.

Our office, on the other hand, operates under the Department of Agriculture and receives annual appropriations from Congress for irrigation investigations. We cover a very wide territory with a very limited amount of money. Our organization not only extends over the whole arid and semi-arid belts where we carry on investigations helpful to the individual irrigators of those entire sections, but we are also making a study of rice irrigation in the Gulf States as well as of supplemental irrigation in the humid region.

The statements that I shall make in attempting to outline the present stage of development in irrigation are derived chiefly from our state agents and from the published reports of the Bureau of the Census, with which our branch has been co-operating for eighteen months past. They shall also be confined to the arid region, since Mr. Williams of our office is to follow me in presenting irrigation conditions in the humid region.

IMPORTANCE OF IRRIGATION TO WESTERN STATES

Those of you who have watched the rise and progress of the commonwealths throughout the Rocky Mountain and Pacific Coast regions, must have observed how large a part irrigated products now bear to the total revenue. Unlike mining, which has unearthed countless millions by the toil of the many but has allowed nearly all of this vast wealth to pass into the hands of the few, leaving the original toiler stranded and helpless, irrigation builds up enduring commonwealths by establishing homes on the land and by fostering a high order of citizenship, good institutions and a stable government.

Irrigated agriculture lies at the foundation of much of the material prosperity of the West. Through the agency of water wisely used, deserts are converted into productive fields and orchards and flocks and herds and prosperous communities take the place of wild animals and an uncivilized race. It also furnishes food and clothing for the dwellers in cities, raw material for the manufacturer and traffic for the transportation company. If it were possible to remove from the arid region the comparatively small area which has been rendered highly productive by means of irrigation, it would go far to undo the labor of half a century in building up the western half of the Union.

THE POPULATION OF THE WEST

The census for 1910 gives the population of the 17 states and territories lying west of the Missouri river at nearly 16½ million. This is an increase of 42 per cent in ten years. In the same time the rate of increase throughout the remaining 31 states was only 17 per cent. I often look upon the trend of population from East to West in this country as bearing some resemblance to the passage of raw material

through a mill. The raw material is dumped into the hoppers of the immigrant-seeking states of New York and Pennsylvania and the finished product emerges on the Pacific Coast and the slopes of the Rockies. This is indeed fortunate for the West, for if there is any place where the quality of the man counts it is on an irrigated tract.

So rapid an increase in western population should not be attributed solely to the irrigation of desert lands. Of late the dry farming districts have attracted thousands of settlers, more manufactories have been established, more railway lines built and ever-increasing numbers are seeking homes in town and cities.

MONEY INVESTED IN IRRIGATION WORKS

The progress of irrigation development may also be measured by the amount of money invested in irrigation works. The census figures for 1910 place this amount at nearly \$305,000,000. Dividing this sum by the total acreage irrigated gives \$22 as the average price per acre of irrigation works, such as reservoirs and main canals. This, however, does not include the expenses incurred by the farmer in installing head ditches and laterals and preparing his land for irrigation. These expenditures would easily average another \$20 per acre, raising the total to something over \$40 per acre and giving us a grand total of approximately \$600,000,000 of capital invested.

Large as this sum may appear it is yet small when compared with the wealth created by the water which such works have provided. If one reckons the cost of irrigation works in millions, he should use billions as a unit to reckon the values created by the water which they furnish. A relatively small amount of capital is invested in the pumping plants and canals of the Santa Ana Valley in California but the purchase of the citrus orchards and other improvements which this pumped water has created would entail an immense outlay. The irrigated lands of few localities possess such high values but the comparison is true for all irrigated districts.

AGENCIES IN IRRIGATION DEVELOPMENT

It is of interest to note through what agencies this vast wealth has been created. What has the individual irrigator done and what forms of organized effort have been instrumental in helping him to accomplish so great an undertaking?

Several distinct forces have contributed to this result. In the first place, we have the individual irrigator, who has either built a ditch himself or called in one or two neighbors to help him. Out of a total of nearly 14,000,000 acres of irrigated land in this country, we must credit this class with 45½ per cent (over 6 million acres). Next come co-operative companies without formal organization which are really merely larger groups of farmers acting together to build the necessary structures. This class covers another 33.8 per cent (over 4½ million acres). Then comes the commercial enterprises of one sort or another which have launched into the business of furnishing a water supply and selling it to the irrigator. This class covers 10½ per cent (roughly 1½ million acres).

Irrigation Districts, a sort of quasi-municipal corporation, come next with 3.9 per cent (approximately one-half million acres).

The Reclamation Service is next in line with 2.9 per cent (less than 400,000 acres).

Companies operating under the Carey Act come next with 2.1 per cent (something under 300,000 acres). Under this act the National Government grants to each of the arid states not exceeding a million acres of desert land, with the proviso that the state shall obligate itself to reclaim the same and cause it to be occupied by actual settlers in small tracts. The states which accept the act in turn enter

into contracts with corporations which construct the works and sell water rights to the settler.

Lastly comes the U. S. Indian Service with 1.3 per cent.

The figures given in detail are as follows:

TYPES OF ENTERPRISES

	Acres	Per cent.
Individual and Partnership Enterprises.....	6,258,401	45.5
Co-operative Enterprises.....	4,646,039	33.8
Commercial Enterprises.....	1,444,806	10.6
Irrigation Districts.....	533,142	3.9
U. S. Reclamation Service.....	395,646	2.9
Carey Act Enterprises.....	288,553	2.1
U. S. Indian Service.....	172,912	1.2
	13,739,679	100.00

LANDS IRRIGATED AND FARMS ESTABLISHED

I have but time to touch briefly upon the geographic distribution of irrigation and the sections where it is making greatest headway. California and her great rival of the Rocky Mountain region, Colorado, are still well in the lead as regards irrigation, but the progress of neither during the past decade has been so rapid as that of Texas, Washington, Idaho and New Mexico. The Lone Star State is in a class by herself in this respect. Excluding the area given to rice culture, Texas has gained 300 per cent in irrigated area in the decade mentioned. Washington, Idaho, North Dakota and New Mexico have each more than doubled in the same time. Oklahoma stands at 96, Wyoming 86, Montana and Oregon 77. Colorado's increase was 73 per cent and California 66 per cent.

As water is provided for dry land, more farms are carved out of the desert, the increase in the number of farms keeping pace with the construction of new works on the one hand and with the establishment of homes on the other. It is surprising that more than one-fourth of all of the irrigated farms that have been established in the 17 western states and territories between 1899 and 1909 has been in California. Rapid progress has also been made by Texas, Washington, Idaho, Wyoming, Colorado, New Mexico and Oregon in the order named. While the states of Oklahoma, Kansas, Nebraska and the Dakotas have greatly increased their areas under irrigation, the number of their irrigated farms has not increased in this past decade.

IMPROVEMENT IN IRRIGATION PRACTICE

The past decade has also witnessed a marked improvement in irrigation practice. Lumber, which was once so generally used, is rapidly being replaced by concrete and steel, resulting in better, safer and more permanent structures. Greater efforts are put forth to prevent unnecessary waste in transmission of water by lining canals. The surfaces of fields are being better prepared to receive water and more care and skill are being exercised in laying out farm systems.

Among the irrigators of Western America are to be found nearly all classes and nationalities. Each settler from another state or from a foreign country introduces on his farm some custom or practice common to his old environment. In this way we are gathering from every corner of the globe ideas about irrigation. These are being tested out under favorable climatic and soil conditions by an intelligent people working under free institutions. The result is a foundation so deep and broad that foreign scientists and engineers are visiting America in ever-increasing numbers to learn about this new practice in American irrigation.

A FORECAST OF THE FUTURE

I have touched upon a few of the achievements of the past but what of the future? The West is now undergoing a temporary setback, but a slackening of the too rapid pace of recent years may prove beneficial in the end. The rate of progress as I shall attempt to show, has not been uniform in all directions and it may be well to halt the vanguard until the stragglers in the rear catch up with the procession. It is a fact that the building of irrigation works is far in the front and the settlement of irrigable lands is far in the rear. There are to-day 5 or 6 million acres supplied with water but unirrigated for lack of settlers. In addition to these areas that await settlement, there are fully ten million acres included in partially completed projects, the managers of which are anxiously looking forward to the time when the water will be in the canals and the settlers on the land. We naturally compare this total acreage, which is to be opened to settlement in the next seven or eight years, to the rate of settlement of the past decade. In ten years of good times we have added to the irrigated area of the West but 6,200,000 acres. In other words, in order to bring settlers to the fifteen million acres of lands which are ready or will be ready to be served by irrigation canals in the next seven or eight years, we will have to procure settlers about three times as fast as we have secured them in the past decade.

Now, no transportation company would be foolish enough to construct a railroad and make no provision for its operation and maintenance. Is it therefore wise for irrigation enterprises to provide water supplies for lands which can not soon be cultivated and irrigated? Four years ago when this Congress met in Sacramento, California, and still again at its sessions in Spokane, Washington, and Pueblo, Colorado, I tried to point out the large areas of land that were unreclaimed because there was no one to plant the seed and moisten the soil. I then urged as I do now, that more consideration be given to those features of irrigation which directly concern the irrigator. It is now our duty to teach the man already on the land how to get higher returns from the areas already open to settlement. Throwing open new areas will not solve the problem. We must demonstrate increased returns from more intensive cultivation, better methods of applying water, more wisdom in planting and in harvesting.

The West must not place on the industrious settler a burden greater than he can bear. Already the price of land under many of the irrigation enterprises is more than he can pay for. Raise it a little higher and he will stay at home.

The value placed upon the farm lands of the United States by their owners has increased 117 per cent in ten years but the value of lands in eleven of the far western states has increased in the same time 203 per cent. Only a little more inflation is needed in some irrigation districts to burst the bubble created by land boomers. Then the rallying cry will be "Back to the shop and the city."

The rapid increase in the value of irrigated land applies with equal force to the value of water. Enterprises which charged \$20 an acre for a water right a dozen years ago have been followed by others which charge double and treble this amount. There is, however, this difference between the two. The value of water is not fictitious. Its upward trend in price has been due to the fact that the supply available for future use is becoming every year less and less. We shall probably never see the day when water will sell for less than it has in 1911. In the states where irrigation is practiced, there are in improved farms 173,000,000 acres but of these less than 14,000,000 acres are irrigated. The time will perhaps never come when more than 50 million acres are irrigated and the large balance which is doomed to be farmed dry will be certain to keep the price of water at a premium. Now, as regards the high price and scarcity

of water for irrigation purposes, two courses are open. One of these is to continue to reach out for fresh supplies as we have done in the past and attempt to utilize these at great cost to the irrigator. The other course is to use with greater economy the water already appropriated. It is not incumbent upon western people to utilize all the water resources of the arid region before 1920 or even 1930. The irrigation structures we are now building and the methods we are pursuing may be thought inferior by our boys when they reach maturity. Then why not leave a little water in western streams for our boys to utilize? It should be our chief concern to make better use of the water we have taken from its natural channel.

Present conditions in many of the irrigation states call for, we believe, a readjustment of land values. While this readjustment is being made, every effort should be put forth to increase the yield and value of irrigated products. Occasionally enormous yields and corresponding profits are obtained from irrigated land. These are freely used as a warrant for holding irrigated lands at a high figure. Nevertheless, it is a fact that the average returns per acre even in the irrigated districts are only medium. Not many parts of the West are more favorable to the growth of alfalfa than Southern Idaho. At our demonstration farms a seasonal yield of 8 to 10 tons per acre of either red clover or alfalfa is readily obtained. It is therefore somewhat disconcerting to learn that the average seasonal yield of irrigated alfalfa for Southern Idaho in 1911, as obtained by the census, was only 3.26 tons per acre. What is true of Idaho is also true with few exceptions of the entire West. The farmers are not getting anything like the greatest possible returns from their irrigated farms.

The census figures show that up to a year ago the extent of land irrigated under the U. S. Reclamation projects was less than 3 per cent of the total. In other words, more than 97 per cent is controlled by individuals, associations, communities and corporations acting under the irrigation laws of western states. These laws and the customs on which they are founded, are still, for the most part, in a formative stage. At every session of state legislatures, some new ideas are crystallized into law, and statutory enactments which were thought almost perfect fifteen or twenty years ago are modified to meet the requirements of changing conditions.

In many states of the West, progress in irrigation is being retarded and costly investments rendered insecure by the lack of proper legislation on the part of state legislatures. Some of these urgently needed laws are clearer definitions in regard to the flow of water in streams and its use in irrigation. Colorado, at the close of 40 years of wonderful achievements in the reclamation of her arid lands, is going back once more to the irrigation primer in an effort to find out the meaning of direct irrigation. It may cost the farmers of this state a million or more dollars to find out whether winter irrigation should be defined as direct irrigation or merely the storage of water in the soil.

Again, if priorities are to hold on the waters of streams lying wholly within the state lines, they should also hold on inter-state streams. A law so general as that of priorities should not become in-operative by crossing an imaginary line which separates two political divisions.

Western states, through their respective legislatures must also get behind the irrigation bond. If it is not feasible to guarantee the irrigation district and Carey Land Act project bond it should be safeguarded by state officers in every possible way. Failing this, such bonds are likely to be discredited and thereby tarnish the good name of western states.

The needs of better and wiser irrigation laws is not more urgent than that of better and more efficient administrative systems. The

state irrigation engineer, if not the nominal head is usually the active head of such systems. When this office is kept out of politics and the incumbent given a long term and a fair salary, good work may be expected, providing the law under which he is operating is satisfactory. On the contrary, when the administrative law is defective, the term of office two years, the salary low and the incumbent more of a politician than an engineer, the great irrigation interests of the state are likely to suffer.

I am unwilling to conclude this brief paper without first reiterating my abiding faith in irrigated agriculture and the final triumph of the West over all obstacles. I can see no good reason to believe that progress in the decade which lies before will be less rapid than in the decade which is past. I have merely called attention to a few things which may retard development unless adequate measures are adopted to safeguard all interests. In my humble opinion, some of the most important of these are, the speedy settlement of lands now under ditch, the giving of additional aid to settlers on irrigated farms, a readjustment of land values and more particularly, orchard land values, a more economical use of appropriated water supplies, broader and better irrigation laws by western states and more efficient administrative systems. (Applause.)

JUDGE GEORGE HUTTON, of California: Mr. Chairman, as Chairman of the Committee on Resolutions, I desire to announce that arrangements have been made for that Committee to meet and lunch together in the English Breakfast Room of the Congress Hotel at 12:30 to-day.

PRESIDENT FOWLER: Before introducing the next speaker, the Chair desires to refer to two items, first, a telegram illustrative of the disappointments that the Program Committee have encountered during the last few days. I have here a telegram received this morning, as follows:

"Lamy, N. M., December 6.

President Fowler, National Irrigation Congress, Chicago, Ills.

Coming along California Limited. Arrive Chicago, Friday. Could you arrange for me to address Congress that afternoon or evening?

"NIELSEN, Delegate from Australia."

We shall be glad to hear from Mr. Nielsen, who holds a high political position in his own country. We were all glad to hear from Mr. Maxwell this morning when he called our attention to an error in the records, as they appeared in a publication. I have been requested to state to the Congress that this publication was from a clipping put into the hands of the Irrigation Age. I make this statement in order to free the Irrigation Age from any responsibility as to the accuracy of the record. That, I think, is simple justice. The Irrigation Congress will see that the correction is made, and I have no doubt the publication will be very glad to do the same thing.

The last paper of the morning will be presented by Professor Milo B. Williams, Irrigation Engineer, Department of Agriculture, on the subject: "Irrigation in the Humid States." I will say in this connection that in an interview last summer with the Secretary of Agriculture, he said that "the Irrigation Congress is not doing quite the fair thing. Why, the time is coming," he said, "when irrigation will be almost as common in the East as it is in the West. There won't be a state but what will be using irrigation. Why don't you have a paper on irrigation in the humid country?" And I said: "Mr. Secretary, the Irrigation Congress would be delighted to hear from you on that subject." He replied that it would be impossible for him to attend the Congress, but "I will send," he said, "a representative who will give you a good paper upon that subject." So I introduce to you now Professor Milo B. Williams of the Department of Agriculture.

Address by

Milo B. Williams

Irrigation Engineer, Department of Agriculture

IRRIGATION IN THE HUMID STATES

The object of this paper is to impress the members of this Congress with the importance of irrigation in the so-called Humid Regions.

This 19th session is being held well East of the climatic division line which has divided the United States into a Humid East and an Arid West. A division line which is held in the general conception as one marking the eastern boundary of irrigated agriculture and the western boundary of humid agriculture. But, this division line is based on normal annual rainfall, and normal annual rainfall is not the true basic factor determining the necessity of irrigation in the present day agriculture. It is the distribution of rainfall, in time and quantity to suit the needs of individual crops, which determines the necessity for irrigation in any locality. Drought records alone, and their effects, furnish the basic figures and these figures, substantiated with those received from field experiments for the past three years, have led the National Department of Agriculture to encourage supplemental irrigation in the Humid Regions as a vital factor in crop insurance.

The revolutionary response which the humid farmers have made is the strongest testimony that they feel the great need for protection against the destruction of droughts. Hundreds of letters have been received requesting instruction in the installation of irrigation plants. The office of Irrigation Investigations is now taxed far beyond its means to supply engineering assistance to farmers.

Demonstration plants are being installed in representative localities at the expense of land owners and the results obtained in these co-operative examples are stimulating many neighbors to adopt irrigation.

The annual rainfall for eastern Minnesota, Wisconsin and Michigan ranges from 30 to 45 inches. Assuming these states have a growing season from the first day of April to the last day of September, Oshkosh, Wisconsin, received in 10 growing seasons 27 droughts, having durations of 15 days or over with less than 1 inch of rainfall.

Sixteen of these droughts came in the spring and early summer, including the one with the greatest duration of 59 days. Seventeen droughts were 20 days and over in duration and effective to nearly every crop grown in Wisconsin. Assuming irrigation beneficial to Wisconsin agriculture, after 15 days have passed with less than 1 inch of rainfall, which is a most conservative basis, there were 292 days during these 10 growing seasons when supplemental irrigation was needed, or approximately one-sixth of the total growing days.

One of our demonstration plants located in central Wisconsin at Neenah irrigates 8 acres of truck and orchard land. One and one-half acres of this farmer's strawberries yielded over \$200 worth of fruit after non-irrigated ones in the same field had ceased to bear for the season. Irrigated onions yielded at the rate of 483.8 bushels per acre, the bulbs taking first premium at the fair for quality. This onion crop received during its growth 3.04 inches of water by irrigation and 5.77 inches by rainfall. But the rainfall failed to do its duty, as the bulk of it came in one large cold storm and the balance in 11 small useless showers. Irrigated raspberries responded with a 10 days longer bearing season, and much more thrifty canes than non-irrigated vines. Three and one-half acres of old apple orchard has borne fruit

three years in succession under irrigation, with a maximum yield this year of 1,149 bushels of high grade apples.

But yet the increased yields is only one of the many benefits of supplemental irrigation to Wisconsin Agriculture. The quality of the harvest is greatly improved. The loss of time caused by a drought in a short growing season may cause the destruction of a most valuable crop by forcing its growth late into the fall, where it intercepts the dangers of frost and a congested market.

The farmer is learning that, when the sun is shining, is not only the time to make hay but is the time to grow hay or any other product. And it is impossible to take advantage of the abundant sunshine and warmth of a drought without an adequate moisture supply in the soil.

Typical of the North Atlantic States, the normal annual rainfall of New Jersey is approximately 45 inches, yet during the growing seasons of 10 years this section has experienced 46 droughts with durations from 15 to 52 days. Twenty-eight of these were spring and early summer droughts, the most effective on all crops. On the basis of these drought records I estimate that the New Jersey farmers should have practiced irrigation at least 352 days during these 10 growing seasons.

During the spring of 1911 the early strawberry crop of many eastern sections was completely destroyed by a six weeks drought. Four acres of strawberries irrigated under the experimental plant at Rancocas, New Jersey, yielded the land owner between \$400 and \$500 per acre. The season's yield of New Jersey alfalfa was increased by irrigation at the rate of 2 tons of cured hay per acre, worth \$25 per ton in Philadelphia. Four acres of 5 year old peach trees responded to irrigation with \$3,400 worth of fruit.

Ladies and gentlemen, do you realize what this demonstration of scientific agriculture means?

These results have been obtained on a farm which has been cultivated for 250 years, on lands which have heretofore failed to yield sufficient returns to keep one boy out of 10 on the farm, lands which heretofore have failed to yield sufficient returns to encourage the clearing up of thousands of acres of similar lands. Similar lands lie here at the very door of European immigration, untouched by the plow, within a few miles of 10,000,000 consumers, land which can be purchased, reclaimed and sold in small producing farms for the price of a family ticket from New York to San Francisco as a first installment.

This historic country has succeeded in building many great cities, has succeeded in developing a manufacturing center of the world, but it has failed to develop its agriculture. An abnormal situation exists, and in my mind the reclamation of the worn out farms and the barren lands of the Atlantic Slope presents agricultural opportunities unsurpassed at this time by any section.

The most humid portion of the Agricultural East is subjected to the greatest irregularity of rainfall. I refer to our Southern States bordering on the Gulf of Mexico and the Atlantic Ocean. The normal annual precipitation of this section ranges from 45 to 55 inches, yet we find that Columbia, South Carolina, has experienced in 10 consecutive growing seasons 62 droughts; 27 of these lasted between 20 and 30 days; 4 between 30 and 40 days; 6 between 40 and 50 days and 1 had a duration of 61 days. On the same basis, as I have judged the other states, irrigation would have been beneficial to South Carolina 568 days during these 10 seasons.

The farms about Selma, of central Alabama, experienced 60 droughts during the same period. The greatest drought here lasted 78 days with less than 1 inch of rainfall, and the total number irrigation would have been useful to in this section in 10 years summed up

to 724 days, which is approximately $\frac{1}{4}$ of the total number of days in 10 growing seasons of 9 months each.

The rainfall of these southern states is extremely uncertain in distribution, and although the climatic records show the winter season to be distinctly dry and the summer season distinctly wet, droughts, or heavy rains, may occur in any month of the year. The rains are often torrential, followed with a protracted drought of abundant heat and sunshine. To correct the effects of both these weather extremes, the South has two distinct reclamation problems: Drainage and irrigation. Drainage of the low lands to carry the excessive runoff to the ocean and thereby improve health conditions and at the same time make productive thousands of acres of worthless swamp lands. Irrigation of both uplands and drained lowlands to insure the farmer against a deficient moisture supply. The necessities for drainage are apparent to every interest of the South. The necessities for irrigation are demonstrated beyond doubt and are apparent to all persons who have studied the trend of Agriculture, and who are familiar with the economical problems of our South.

Irrigation of wornout cotton lands at Selma, Alabama, has made a garden spot among plantations covered with negro huts and ruined country homes. Irrigation at Albany, Georgia, has tripled the yield of corn and made the growing of alfalfa a success. Irrigation of uplands in Florida has made citrus fruit culture less difficult and produced the famous Hastings potatoes on drained lowlands. Irrigation of drained lands at Sanford, Florida, has produced winter crops of celery which have sold for more than \$2,000 per acre, and changed the calamity of the great Florida Citrus Freeze of '95 and '96 to a transition point of prosperity.

Irrigation will do for the South what it has done for the West. It will insure results to the small farmer. The coming of the small farmer in the South will cause the passing away of great wasting areas and ruined plantations, as the coming of the small farmer in the West is causing the passing away of great deserts and wasteful wheat ranches.

Although the woodman's ax and the turnpenter's girdle have defaced this South land, agriculture has only scratched between the stumps in its search for cotton.

The breaking up of the one crop system and the division of large holdings into small, intensive, rotative, irrigated farms will transform a country of wastes and barrens into a land of homes and productivity.

This is an immediate problem.

The South to-day represents one of the largest areas of dormant latent agricultural possibilities in this nation, and the key which will unlock these possibilities from their dormancy, and ever afterwards be the key to protect the South in her social problems, make her states wholly healthful for homes, and stay the sweep of the oncoming boll-weevil is reclamation—reclamation of her lands into small, drained, irrigated, rotatively cropped farms for settlers.

Surely, this Congress is rightly named; its problems are only bounded by the boundaries of the Nation. (Applause.)

PRESIDENT FOWLER: We will now have the report of the Committee on Credentials.

Members of the

COMMITTEE ON CREDENTIALS

The members of the Committee on Credentials were:

Washington	F. A. Turner (Chairman)	Copalis
Arizona	D. P. Jones	Mesa
California	B. A. Etcheverry	Berkeley
Colorado	Newton L. Hall	Denver
District of Columbia	R. P. Teele	Washington
Florida	Wilbur McCoy	Jacksonville
Idaho	H. J. Weaver	Filer
Illinois	John N. Lopp	Mt. Carmel
Indiana	W. L. Davis	Frankfort
Iowa	M. F. P. Costelloe	Ames
Kansas	I. L. Diesem	Garden City
Minnesota	Wm. Egeland	St. Paul
Mississippi	P. H. Saunders	Laurel
Missouri	Thomas Knight	Kansas City
Montana	R. A. Carnochan	Butte
Nebraska	R. P. Scott	Bridgeport
Nevada	A. H. Barlow	Mason
New Mexico	L. Clapp	Hatch
Ohio	John H. Chester	Antwerp
Oklahoma	H. J. Hooker	Altus
Oregon	G. B. Simpson	Chicago, Ill.
South Dakota	O. E. Farnham	Belle Fourche
Tennessee	E. S. Shannon	Nashville
Texas	L. E. Behr	El Paso
Utah	Horace W. Sheley	Salt Lake City
Vermont	D. O. Carr	Gary, Ind.
Washington	W. G. Paine	Spokane
Wisconsin	Delbert Utter	Lake Beulah
Wyoming	Chas. Waegle	Buffalo

PRESIDENT FOWLER: Gentlemen, it will take but a moment to read the report of the Credentials Committee.

Secretary Hooker then read the report of the Committee on Credentials, as follows:

REPORT OF COMMITTEE ON CREDENTIALS

Chicago, Ill., December 7, 1911.

The Nineteenth National Irrigation Congress:

Gentlemen: Your Committee on Credentials beg leave to report as follows: Attached hereto in alphabetical order, under state and insular possessions from whence they come, are all the delegates who have presented their credentials and registered up to 5:30 p. m., December 6, and your committee recommend that this list be recognized as the Official Roster to serve as a basis of representation of the various states, until further report is presented by this committee.

Your Committee desires to call to the attention of the Congress the fact that a vote of the Congress has already been taken on a formal resolution, namely, that of the report of the Executive Committee, be-

fore any report of the committee had been presented, in apparent contravention of Section 4, Article V of the Constitution.

Your Committee recommend further that all delegates presenting proper credentials be added, from time to time, to this list as they are registered by the Assistant Secretary, and that this Committee be continued and allowed the privilege to add to the Roster the names of such delegates.

Your Committee deem it prudent to attach hereto the minutes of each session for future reference.

Respectfully submitted,

(Signed) F. A. TURNER,
Chairman.
L. CLAPP,
Secretary.

MR. F. A. TURNER, of Washington: Mr. President, as Chairman of this Committee, and in behalf of the work done by this Committee, I move the adoption of the report of the Committee.

The motion was seconded, and the report of the Credentials Committee was duly adopted.

DR W J McGEE, of Washington, D. C.: With reference to that item in the report of the Credentials Committee, relating to the adoption of the report of the Executive Committee on the first day of the session, I desire to say that, in the judgment of the Executive Committee—and I am speaking in the temporary absence of the Chairman of the Committee for last year—in the judgment of the Executive Committee, and in accordance with the custom of the Congress, there is no contravention of the Constitution involved in the acceptance and adoption of the report of the Executive Committee in advance of the report of the Credentials Committee; nevertheless, to remove any possibility of question in the minds of any of the delegates present, I desire to move you, sir, that the adoption of the report of the Executive Committee on the first day of the session be now ratified.

The motion was seconded and duly carried.

Those registered at the Congress were:

ALABAMA

T. B. Woods . . . Furniss Av., Selma

ARKANSAS

S. E. SimonsonLuxora

ARIZONA

E. O. BrownPhoenix	Mrs. B. A. Fowler
Garth W. Cate . . . . .	. . . 1005 North 1st St., Phoenix
.382 N. 1st Av., Phoenix	Ernest HallBox 994, Phoenix
A. J. ChandlerMesa	Geo. W. HanceCamp Verde
Mrs. Clara B. Dismukes	Dwight B. HeardPhoenix
.Westmoreland Pl., Phoenix	Daniel P. JonesMesa
E. E. DravoPhoenix	Jno. P. Orme, R.F.D. No. 1 Phoenix
B. A. FowlerPhoenix	L. W. PowellBisbee
	B. WingarMesa

CALIFORNIA

Frank Adams	C. B. Boothe
Care Irrigation Investiga-	1515 Garfield Av., So. Pasadena
.tions, Berkeley	Wm. Casey
R. DeV. Bessac	Chairman, Board of Super-
.336 N. Sutter St., Stockton	visors, Monterey Co., San Lucas

Newton Cleaveland
 Peoples Bk. Bldg., Sacramento
 B. A. Etcheverry
 2598 Buena Vista Way, Berkeley
 John Fairweather
248 Van Ness Av., Fresno
 Mrs. John Fairweather
248 Van Ness Av., Fresno
 F. P. Felix, ... Mayor, Salinas City
 Edward Fletcher
1710 Ash St., San Diego
 Herbert H. Garstin..... Redlands
 H. A. Greene Monterey
 J. H. Henry Templeton
 Francis Hope
 Care California Develop-
ment Board, San Francisco
 Geo. H. Hutton
Court House, Los Angeles
 Mrs. Geo. H. Hutton.....
927 Second St., Santa Monica
 C. F. Lacey, 129 John St., Salinas
 D. A. Madeira
137 Central Av., Salinas

F. S. Myers
121 E. Gabilan St., Salinas
 James F. Peck Berkeley
 Chas. L. Pioda, 54 John St., Salinas
 H. W. Smith
 968 Flood Bldg., San Francisco
 Wm. E. Smythe.....
506 Scripps Bldg., San Diego
 R. A. Stirling Salinas
 L. B. Ulrey
 cor Vanderhurst Av. & Lynn
 St. King City
 F. G. Vivian King City
 Mrs. F. G. Vivian King City
 W. C. Wall
336 N. Sutter St., Stockton
 S. V. Walton.....
445 Sutter St., San Francisco
 Douglas White
 Pacific Electric Bldg., Los
 Angeles
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 303 Phelan Bldg., San Francisco
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tion Journal Chicago
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.....Chicago American, Chicago
J. S. Winslow
.....Chicago Tribune, Chicago

KANSAS

R. H. Faxon
 Evening Telegram, Garden City

MICHIGAN

Herman O. Zander
 Better Fruit, Hood River,
Ore., Ada

MISSOURI

F. L. Vandegrift
The Earth, Kansas City

NEW MEXICO

Willard E. Holt Forrest McKinley
Deming Graphic, Deming ..El Paso Herald, Las Cruces

PRESIDENT FOWLER: The program for the morning has been nearly finished. There is one paper by Judge Hutton that will be first on the afternoon program. We have another illustration of the difficulties under which the Program Committee have been laboring. I am glad to have them come up before the Congress, so that you can see what we have had to contend with during the Congress. We have just received from Col. A. R. Lawton, Vice-President of the Central of Georgia Railway Company, a telegram to the effect that he cannot be here, and on that account we will have to excuse him.

The difficulties of the Program Committee are further illustrated by telegrams from two good friends of the Congress who had expected to be present and address the meetings. Dr. F. H. Newell, Director of the United States Reclamation Service, had planned to address the Congress Tuesday afternoon, and a telegram from him which should have been read at that time is here presented for incorporation in the official record. Dr. Newell telegraphed:

TELEGRAM FROM DIRECTOR NEWELL

"Regret impossibility my being present Tuesday afternoon. Chief Engineer Davis and Blanchard have left for Chicago to represent Reclamation Service. My best wishes for an effective meeting."

Another disappointment is a telegram from Prof. Henry S. Graves, head of the Forest Service. Forester Graves telegraphs:

TELEGRAM FROM FORESTER GRAVES

"A number of very important matters have come up absolutely requiring presence in Washington this week. Am exceedingly sorry that I can not meet my engagement to speak Friday and am deeply disappointed to miss Irrigation Congress."

Upon motion, duly seconded and carried, the Congress was then adjourned until 2:30 o'clock p. m. of this day, December 7, A. D. 1911, to reassemble in Orchestra Hall.

SEVENTH SESSION
THURSDAY, DECEMBER 7, 1911

2:30 o'clock P. M.
ORCHESTRA HALL

The Congress was called to order by President Fowler at 2:40 o'clock p. m., in Orchestra Hall.

PRESIDENT FOWLER: Gentlemen, you will come to order. We have another illustration here of our disappointments, in the shape of a telegram from Mr. William Mulholland, of Los Angeles, California. I think we can excuse him for a pretty good reason. His telegram reads:

"Neither Lippincott or myself are able to be present at convention. Los Angeles is in the midst of a municipal election in which the aqueduct is the important issue of the campaign. Both of us are in duty bound to remain here and make personal defense of the project.

(Signed) "WILLIAM MULHOLLAND."

There have been two resolutions handed in to the Congress, one of which was passed by one of the delegations to the Committee at a late hour, so late that it could not be presented yesterday. You will remember that the rules call for the presentation of resolutions before Wednesday evening. After that they can only be introduced by unanimous consent. Under the circumstances, unless there is objection on the part of some delegate to the Congress—and I wait for any objection—if there is no objection, I will ask the Secretary to read the resolutions that have been handed in.

Secretary Hooker thereupon read the resolutions expressing approval of land and product expositions, when properly conducted, and suggesting procedure to insure that they be so conducted.

Secretary Hooker also read a resolution presented by Mrs. T. Vernetta Morse, of Illinois, suggesting that for future meetings the co-operation of the women of the country be invited through state and national federations of women's clubs.

PRESIDENT FOWLER: Referred to the Committee on Resolutions without debate. The first paper of the afternoon will be by Judge George H. Hutton, of California, on the subject "Appropriation and Riparian Rights—The California Doctrine."

Address by

George H. Hutton

Presiding Judge Superior Court, Los Angeles, California

**APPROPRIATION AND RIPARIAN RIGHTS—THE
CALIFORNIA DOCTRINE**

Mr. President, Ladies and Gentlemen of the National Irrigation Congress:

I feel greatly handicapped in coming before you this afternoon, in this: that last year an opportunity was afforded me to present you the beautiful picture of development in California under irrigation while to-day it falls to my lot to present the frame-work, the docking and the

light upon that picture, the thing that holds it up and illustrates it. It will not, in the nature of things, be as interesting or as entertaining, but it is the subject assigned me by your committee, and I shall endeavor to fill it to the best of my capacity.*

The published report of the oral argument in the famous Kansas-Colorado Case at page 112 shows that at a point where the attorney-general was attempting to argue that which he frankly admitted he did not understand, namely: The California Doctrine, he was interrupted by one of the justices of the Supreme Court of the United States, who is reported in the record to have said, "I have been over the cases (referring especially to *Katz vs. Walkenshaw*), and in my opinion you cannot get very near an understanding or definition of the California Doctrine." The record further shows that a number of witnesses were called and asked concerning the California Doctrine and each said he did not understand it; and yet this same California Doctrine, incomprehensible to the justices of the Supreme Court of the United States, this California Doctrine, incomprehensible to the distinguished and able representative of the Department of Justice, this California Doctrine, incomprehensible to the many experts called in that case, is so well understood and acted upon by a million California farmers, that they raise a billion dollars worth of irrigated products annually. Since the clarifying definition of that doctrine in *Katz vs. Walkenshaw*, 141 Cal., litigation has decreased in about the same proportion that irrigation has increased. In my own humble capacity, sitting as a judge of the Superior Court of California in Los Angeles City, the very center of intensive irrigation, I have frequently been called upon to interpret and apply the California Doctrine and have never had my interpretation successfully attacked. If the theory is hard to understand, the practice is easy of application. The definition of the California Doctrine as it is generally understood and accepted by lawyers and laymen, farmers and hydraulic engineers and all persons having to deal practically with that subject is about as follows: The California Doctrine is the limited right of appropriation as a basis of title by prescription and the riparian owner's correlative right to appropriate so much water as he can put to an economical, beneficial use on his own riparian land, plus the general right of appropriation as against the government alone and the right of appropriation against all the world except the superior right herein indicated. This definition is not invulnerable but I believe it to be a fair and reasonably comprehensive statement of the doctrine, a law best adapted to California conditions. The riparian owner's prior right of appropriation is the key-note of the doctrine. I believe the rule to be declaratory of a deep-rooted principle, a great fundamental truth founded in the very nature of California mountains, soils and streams, inscribed as Blackstone would say by the hand of God in the foundation of the earth itself.

The doctrine is only complex in that it calls for a reconciliation and sometimes a joint application of four distinct principles: First, The prior right of the land bordering on the stream to use the same to the extent of its needs. Second, The prior right of land overlying a mass of percolating underground water to use the same to the extent of its needs. Third, The law of prescription, whereby five years of adverse use gives a right to continue the use. Fourth, The right of appropriation as against all the world except prior appropriators and owners of bank lands and allowing even this as a basis for title by prescription.

Any application of the common law riparian doctrine to the California doctrine of appropriation and riparian rights is a misnomer. At common law, the lower riparian owner was entitled to the full flood of the stream, undiminished in quantity and uncontaminated in quality. In California the lower riparian owner is entitled to the full flood of

*See address by Judge Hutton, Official Proceedings, Eighteenth Congress, P. 183.

the stream undiminished in quantity except such correlative proportion as the upper riparian proprietor puts to an economical beneficial use on his own riparian land, a very different proposition. The lower riparian owner still has, however, the right to such waters of the stream as may come to him uncontaminated in quality.

This principle of law is not a new doctrine evolved for the first time in California, but is a doctrine so old that it must have been scrawled in picture writing by primordial man in his unhewed cave; and the principle was then so old as to be recognized as fundamental. We find reference to it in the earliest of writings. In the Egyptian Book of the Dead (Ch. 125) we find this expression: "I do not repel or set back the waters; I do not turn aside the flowing of a canal; I do not soil the water." In Ezekiel XXXIV Ch., 18th and 19th verses, we find these words: "Seemeth it a small thing unto you to have drunk of the deep waters but ye must foul the residue with your feet; and as for my flock, they eat that which you have trodden and they drink that which ye have fouled with your feet." Blackstone, Vol. 1, p. 263. The Justinian Code and Code Napoleon contain declarations to the same effect cited later in this paper. These familiar expressions surely declare a principle of natural law established with the very foundation of the earth itself, for the doctrine of the riparian owner's first right of appropriation, which is the basic principle of the California Doctrine, means nothing more and says nothing more than that nature's laws are observed by the Courts and Legislatures in California and that pursuant to nature's laws, the lands bordering on a stream, which in a state of nature would be watered either by seepage and percolation or by the natural waters flowing into a stream bed, will have the first right to the use of the waters of that stream under artificial cultivation as in a state of nature.

The old rule "Unto him that hath shall be given" is a rule declaratory of natural law and like all other rules of natural law, must be obeyed. De Buffon, Vol. 2, page 48, says, "Water has, on riparian properties, a natural primordial right—the right to a sufficient and proper channel in which to pass.... River waters are, then, from time immemorial, in possession of canals carved out of the surface of the earth, in dimensions proportioned to the quantity of the flow to be carried. This is possession on the part of the state. The existence of the canals, as old as the world, is a title in the state, inscribed in the ground by the hand of God for the common good. Consequently it is a sound conclusion that public authority should have the right, and that it should be its duty, to have them respected and not tampered with." By the law of nature, flowing water is the property of all. Water, like air and the birds of the air, is the property of all.

Justinian Code, Lib. 6, Tit. 1, Sec. 1.

Justinian Code, Lib. 8, Tit. 3, Sec. 17.

Colquhoun, Sec. 923—Gaines P. 209-210.

By the law of California all water is declared to be dedicated to a public use.

Constitution, Art. 14, Sec. 1, says: "The use of all water.... is hereby declared to be a public use."

Since *Lux vs. Hagin* and especially since *Katz vs. Walkenshaw*, we have applied in California this rule of law which finds its source and authority in the deeper principles of the law of nature and the tried and tested laws of ancient Rome, and our laws give, as nature's laws give, to the owner of the bank of a stream the first right to the use and benefit of its waters, but we do not allow him to be a "dog in the manger." He must use his own so as not to interfere with others. He must not pollute the water, but he may take out such correlative proportion as he can put to an economical, beneficial use for irrigation upon his own riparian land. This was decided in *Lux vs. Hagin*, and nothing else was decided in that great cause, although it has 200 pages

of valuable text-book authority. It has frequently been said that riparian rights and the right of appropriation are utterly inconsistent with one another, that they cannot exist side by side with the laws of any state. The answer to this is that in the modified sense in which "riparian" is used, they do exist side by side without conflict, without injury to each other, but each helpful and useful in its own particular sphere; and under this dual rule, the most intensive cultivation under irrigation known to the world is being successfully carried on, thus demonstrating the practical utility of the California Doctrine.

If I were to stop here, my explanation of modified riparian rights as applied to the California Doctrine would be incomplete. I use the word "riparian" here only for want of a better word to illustrate my meaning.

The riparian rights of an owner of bank land upon a surface stream is one thing, and the so-called riparian rights of the owner of land overlying a mass of moving percolating water beneath the soil is a somewhat different thing in fact but not in law, and our courts have virtually held in *Hudson vs. Daly*, 156 Cal. 618, and *Burr vs. McClay Rancho*, 158 Cal. 428, that the land overlying such a mass of percolating water is treated as if riparian thereto and that the owner of land directly overlying a mass of percolating water may draw out, by pump or artesian well, so much water as he can use on his own riparian land for an economical and beneficial use, subject to correlative rights of others similarly situated; the word riparian here being used to mean the land overlying the saturated plane. (The word riparian in this connection is not used by our supreme court, and my use of it here as applicable to land overlying a mass of percolating water is more illustrative than scientific.)

It will thus be seen that the California Doctrine of Riparian Rights, or properly speaking, the riparian proprietor's right of appropriation as hereinbefore modified and explained, is an inflexible rule of law, an absolute and fixed right and can only be lost by grant or adverse possession, and by that rule the riparian owner, whether riparian to a surface stream or to an underground percolating channel or saturated plane, may draw out so much of his correlative proportion of the water as he can put to an economical, beneficial use on his own riparian land but he must allow the riparian owner above him to do the same thing. The absolute right of appropriation, as distinguished from the riparian owner's right of appropriation, will become less and less exercised as the subject of absolute appropriation passes out of the hands of the government and into the hands of private citizens. The bench lands will be irrigated and are being irrigated by an application of the principle—damage without injury—and our courts will not permit a lower riparian owner to complain of an injury unless he is hurt, or to invoke the extraordinary remedy of injunction when an action for damages will protect his rights, (*Temescal vs. Newport* and *Perry vs. Cawkins*, 41. Cal. Decisions 102.)

The Rule of Correlative Rights simply means that all must suffer alike from shortage and participate alike in abundance just as where rainfall is relied upon. "The rain falls upon the just as well as on the unjust."

For a full discussion of Correlative Riparian Rights see *Wiel on Water Rights*, 3rd Edition, Page 796 and authorities there cited.

The most important principle of the California system of water law rests upon the civil-law idea that running water in a natural stream is not itself, in specie or as a substance, the subject of ownership, nor property in any sense of the word, but is in a class with the air in the atmosphere or the birds in free nature. The law of watercourses in California is deduced, not from the common law, but from the following civil-law principles:

1. The corpus of running water in a natural stream is not property

in any sense of the word; but is, like the air or the birds in the atmosphere, or like fish in the water, not the subject of private ownership, and nobody's property.

2. The only property right thereto that can exist is the right to take and use the water (called usufructuary) and have it flow that it may be taken and used.

3. The portion taken out of the stream, passing under private possession and control, becomes the private property of the taker (during such possession only), becoming again nobody's property when it escapes or is abandoned.

The law of appropriation is just as much a natural law as the modified riparian law. Appropriation is the original source of all title to property and under certain conditions and especially in sections where the government alone is affected the rule of appropriation is the only source of title. The government recognizes the right of its citizens under certain conditions and respects to appropriate the unoccupied government lands and waters, but too frequently we forget that when a homsteader on government lands files upon his homestead, he makes an appropriation of that homestead and all the incidents and appurtenances naturally belonging thereto, including the right as a riparian owner upon the bank of a stream. The point was well illustrated in a recent case tried before me in Los Angeles County. Each one of the parties to this action occupied a piece of foothill government land adjacent to the forest reserve. A small stream having its source on government land in the mountains flowed down the canyon, first through lands of the upper proprietor, plaintiff in the action, and then through and upon the lands of the lower riparian proprietor (defendant in the action), where it debouched into the floor of the valley. The stream was small; either could use its entire available flow on his own land. Each went up into the mountains on government land and made an appropriation of the entire stream. Plaintiff attempted to carry it down in its natural, proper channel and use it upon his own land and defendant attempted to carry it in a ditch around plaintiff's land to his own. The suit was brought by plaintiff, declaring upon his right as an appropriator. A cross-complaint was filed by defendant declaring upon his right as an appropriator. I found that neither was an appropriator and that the waters of that stream could not be appropriated for reasons expressed in that opinion, a part of which was as follows:

"Plaintiff and defendant are both wrong in relying upon their appropriations of 1910, as the water had long since ceased to be a subject of appropriation. (See *Lux vs. Hagin*, 69 Cal. Page 344.) It is true that this stream rises in a canyon on government land, is gathered in the bed of the stream of this canyon and concentrated at a bed rock point in the stream a few hundred yards before it enters upon and crosses the lands of plaintiff, and after so crossing the lands of plaintiff enters upon and crosses a part of the lands of defendant and debouches into the floor of the valley on his land.

"It is a great mistake to assume that the waters of a stream under these conditions are the subject of appropriation. The only waters that may be appropriated (under C. C. 1410) are the waters of streams on government land and this before the rights of settlers upon the stream, who by reason of their settlement become riparian owners, have accrued except as in *Duckworth vs. Watsonville*, 150 Cal., 531, where appropriation is made the basis of title by prescription and where there are no superior rights. Section 1422 of the Civil Code itself provides that the rights of riparian proprietors are not affected by the provisions of this title, and *Lux vs. Hagin*, 69 Cal., page 259, has forever put at rest the question as to whether or not riparian rights of a settler on government land may be taken away from him by an up-stream appropriator. In that case, at page 350, the court says:

'It may be conceded that while lands continue public lands, and in controversies between occupants of land or water thereon, the common law doctrine of riparian rights has no application.

"But where one or both of the parties claim under a grant from the United States (the absolute owner, whose grant includes all the incidents of the land and every part of it), it is difficult to see how a policy of the state, or a general practice, or rulings of the state court with reference to adverse occupants on public lands, can be relied on as limiting the effect of grants of the United States, without asserting that the state, or people of the state, may interfere with "the primary disposal of the public lands." Since the United States, the owner of the land and water, is presumed to have permitted the appropriation of both the one and the other as between themselves the prior possessor must prevail.

"None of the early cases intimate that the occupant of land bordering on a stream was presumed to have any less rights in the usufruct of the water than the absolute owner of the land so situated, or that the presumption in his favor was limited to the land without the water, except where the water has been already appropriated.

"But an appropriation of land carries with it the water on the land, or a usufruct in the water; for in such cases the party does not appropriate the water, but the land covered with water. He would be entitled as riparian proprietor to the free and uninterrupted use of the water, without any other or direct act or appropriation of the water as contradistinguished from the soil. If such is the case, why should not the defendant who has appropriated land over which a natural stream flowed be held to have appropriated the water of such stream as an incident to the soil, as against those who subsequently attempt to divert it from its natural channels for their own purposes?"

"At page 357 the court says: 'Crandall vs. Woods, *supra*, very distinctly decides that, as between an occupant of riparian land (part of the public lands of the United State) and a subsequent appropriator of the waters of the stream, the former may assert the riparian right under the rule *Qui prior est in tempore potior est jure*.'

"Hence it follows as the night the day, that when the rights of settlers attach to the land no appropriation can be made that will interfere with his riparian rights. His riparian rights are just as much a part of the land as the trees upon it and unless taken away before his settler's rights accrue, he must be left in the enjoyment thereof unmolested."

The great trouble with the California Doctrine, so called, arises not from the doctrine itself or the application of that doctrine by our Supreme Court, but a vast misunderstanding among lawyers and laymen and courts of other states as to the real meaning of that doctrine. The misunderstanding arises largely because the habit of mind of the eastern lawyer and jurist causes him to think in terms and in the light of his own experience in an over-watered country while the habit of mind of the Californian naturally causes him to think in terms of his own life's experience in a semi-arid country. It is the old story of one warrior insisting that the shield was gold and the other insisting that the shield was silver; both were right, one side was gold, the other silver, and each saw it from opposite sides.

The law of California is but a development of the questions, who may have the usufructary right to take and make private property or private use of the unowned substance and subject to what conditions.

An appreciation of this fundamental civil-law conception that the water running in a natural stream (*aqua profluens*) is not a part of the land, nor the subject of property in any sense of the word, is essential to an accurate understanding of the California Doctrine.

The California Doctrine of riparian rights applied in conjunction with appropriation may thus be summarized:

1. An absolute or non-riparian appropriation can only be made from a stream below the point of appropriation not previously appropriated, when the entire stream is on government land or when riparian owners below will not be injured, and the lower owner will not be permitted to assert injury, if the riparian owner above is using the water in the most beneficial way, even though he consume the entire stream. *Stanford vs. Felt*, 71 Cal., 249, *Wiggins vs. Muscupiable*, 113 Cal., 189.

2. A riparian owner's right of appropriation is the correlative right given exclusively to a riparian owner to take so much water from the stream (surface or sub-surface) as he can put to a beneficial, economical use on his own riparian land.

3. Land is riparian to a stream or sub-surface when it borders on the stream and is within the watershed.

4. Land is treated as if riparian to a percolating mass of water when it overlies the mass so that it can draw therefrom by capillarity, pumps or flowing wells.

5. Last but most important of all, the California Doctrine is best applied in the light of that greatest of all legal principles: "Do unto thy neighbor as thou wouldst have thy neighbor do unto thee." (Applause.)

MR. THOMAS KNIGHT, of Missouri: Is the question open for discussion?

PRESIDENT FOWLER: Certainly.

MR. KNIGHT: I would just like to ask Judge Hutton a question. What has been the California experience with regard to the utilization of the water? In other words, the riparian owner takes water—the upper appropriation—how much does it actually damage the owner below him, providing he returns it to the stream? How much does the lower appropriation suffer practically, if anything?

JUDGE HUTTON: Practically speaking, he loses by evaporation and plant life, the conditions of plant life. That is what you mean, isn't it?

MR. KNIGHT: Yes.

JUDGE HUTTON: He loses, in the coastal plain of Southern California between 40 and 50 per cent. In the desert region, in the Colorado desert, and I refer especially to the Imperial Valley, and in the Mohave Desert, where irrigation takes place, he loses practically all of it.

I do not think there is any substantial return of the water from irrigation where it is used in the Imperial Valley Desert, but in the coastal plain in California, I mean all the country from Redlands to Los Angeles, the returned waters from irrigation amounted to between 40 and 50 per cent, varying of course according to the amount of evaporation and the particular time and season of the year.

MR. KNIGHT: My object in asking the explanation was in order to disabuse the minds of many of us that water used in irrigation is thereby destroyed.

JUDGE HUTTON: I would like, if that be the question, to further explain and state that in the paper I had the pleasure of presenting to Congress last year, I diagramed the Santa Ana River, and I illustrated it as a series of tin wash basins, in which the water was stored by artificial methods, and that that method has proceeded, and I showed by the various watercourses that the flowing wells, that for years had to be pumped, are flowing again, and that the water supply is constantly on the increase. In other words, it illustrates the argument presented here this morning by Mr. Maxwell, that, if the river is stored in the subterranean basins up-stream, it acts as a sponge and holds it up until such time as it is needed. We have precisely that condition on the Santa Ana River.

If any delegate is especially interested in that he can get the facts and the explanation and the entire details of that river in the published report of last year.

MR. A. R. SPRAGUE, of California: I would like to ask, in treating percolating floods, if the using of uncemented canals and ditches is held to be economical?

JUDGE HUTTON: I am glad you brought up that question. The wasteful ditch is one of the most unfortunate features existing in some localities in Southern California. I have in mind an irrigation district in Los Angeles County where a very wasteful ditch was used to distribute the appropriation of water from the San Gabriel River, a plain, dirt ditch. The owners of the land within that irrigation district permitted the people down below to come up and make that ditch a cement ditch and take the waters that were thus saved. I think that we need legislation to enable the farmers or the landowners down below to go in and condemn the wasted water of a wasteful ditch, and I did prepare an amendment to the law and went down to the legislature two years ago, but it was not acted upon because they were pretty busy with other things and I was not there to push it.

MR. HORACE W. SHELEY, of Utah: I would like to ask whether, in a ditch that has considerable seepage from it, will the people who own the ditch be permitted to save the water at the end of the season, in California?

JUDGE HUTTON: Yes, in the case of McClintock vs. Hudson, which I have cited in this paper, that precise point was covered; and also in the Cohen case. The Cohen case was a case where the waste waters of a spring were so appropriated, but I believe in that case the statute of limitations ran, so as to prevent appropriation. In the absence of the statute of limitations, we have no square decision on that point. We have it where the statute of limitations has been invoked and where it has been very generously used, and where the court has gone a long way to establish the rights by equitable estoppel, even, but no case in which that point has been fairly decided in the absence of other equitable estoppel or statute of limitations.

PROF. SAMUEL FORTIER, of Washington, D. C.: I wish to ask Judge Hutton if the courts of California have given any clear definition of how far back from the stream riparian rights extend? In your state you have large lands bordering on the streams; how far do the riparian rights extend in reference to such a stream as the San Joaquin?

JUDGE HUTTON: Within the watershed. Whatever water, in the state of nature, would flow into that stream, if left uncontaminated, is riparian to that stream; bearing in mind that the water must be used in an economical and beneficial way.

MR. ALEX McPHERSON, of New Mexico: I would like to ask the Judge this question: if I understood him right, to say that the Supreme Court held a priority of water right, where the water is either artesian or from pumping, where the source of the water was absolutely unknown?

JUDGE HUTTON: No, I do not wish to be understood as saying that. The source of the water is seldom unknown.

MR. McPHERSON: We have artesian wells and there are hundreds in now and many more going in. The question is often asked by some people, "Where is the water coming from?"

JUDGE HUTTON: That question would be first answered, by order of right—first in time, the first in order of right, the same rule that applies in the barber shop when you want to be shaved.

MR. SPRAGUE: One question I think was not fully answered. The gentleman I think desired to know how far back from the stream

lands could be claimed as riparian for irrigation? For instance, suppose a man holds on a stream, an eighth of a mile, but at right angles to the stream he owns for five or ten miles, using an extreme case; can he claim all the water he chooses to divert on that long strip?

JUDGE HUTTON: The answer to that question lies in the natural conditions. If in a state of nature water falling upon that area would flow directly into that stream, if it is within the watershed and he has access to the stream—access to the stream is the element I think I left out in answering the other gentleman's question—he must have access to the stream and be within the watershed.

JUDGE FAIRWEATHER: I should like to ask the Judge a question, because it is rather contradictory to the ideas that we have carried in our section of California. I have always understood that the Supreme Court has not really decided in the state of California what riparian lands really are. Now, Judge, we have gone on this principle: that where a man gets a deed from the government for a certain piece of ground adjoining the stream, that is riparian, but if he should get onto another section adjoining the identical piece of ground that he got first, the second would not be riparian.

JUDGE HUTTON: You are entirely correct.

JUDGE FAIRWEATHER: That is, in the same watershed?

JUDGE HUTTON: Yes, but I stand corrected, that in my first answer I did not cover contact with the point of the stream, contact with the stream and within the watershed.

JUDGE FAIRWEATHER: With the first purchase?

JUDGE HUTTON: Yes, sir.

JUDGE FAIRWEATHER: Not with the second?

JUDGE HUTTON: No, sir.

PRESIDENT FOWLER: Gentlemen will keep in mind the injunction that the Chair has offered, that the Chair is the medium through which all communications shall pass—questions and answers.

DR. W J MCGEE, of Washington, D. C.: In an inquiry addressed through the Chair to Judge Hutton a few moments ago by the gentleman from New Mexico, a premise was made which strikes me as unfortunate, namely, the case in which the source of the water is absolutely unknown. It seems to me, Mr. Chairman, that that premise can not be argued anywhere within the length or breadth of the United States to-day. There are several departments of the federal government engaged in the work of determining the sources of the ground waters, the artesian waters in every portion of the country, and I believe I may summarize very briefly the result of these investigations to-day when I say there are no artesian waters or other ground waters anywhere in the United States whose sources are unknown. By a proper appeal to the experts on the subject, the sources of any waters in the United States can be determined.

JUDGE HUTTON: I would like to back up Dr. McGee in that statement, so far as California is concerned, or so far as southern California is concerned. I was not prepared to make the statement as broad as he has, because my knowledge of the situation is confined to California and largely to the southland. But I do know that in a very large number of cases that I have tried both as a lawyer at the bar and for the last five years as a judge of the Superior Court of Los Angeles County, and I think I have tried more cases than any other judge on that bench, and I have invariably done this: I have sent to the department and obtained the water supply papers that covered

the particular canyon or valley or area that was involved. I then do what I may have a questionable legal right to do—but I do it—I introduce that government report as Court's exhibit No. 1, and then if any lawyer wants to attack anything on it, he can, and if he wants to accept anything in it, he may do so. I find from actual experience that, except in some minor details, the parties on both sides of the controversy, as a general rule, accept that report as being final. I can not speak too highly of these reports.

MR. E. F. BOHM, of Ohio: I would like to have it made a little more clear just how you define the borders of riparian land, with particular reference to title.

JUDGE HUTTON: That is a question that the Supreme Court of California has never attempted to answer by a general definition, except in the way which I have given it: within the watershed and coming in contact with the stream. As to the subject of ownership, which is the particular point of the gentleman's question, they have said repeatedly that the tracts or the particular ownership must be, under the circumstances of each case, left to be determined in that particular case. There is no fixed rule.

MR. MATT RUSSELL, of Texas: I wish to ask the Judge one question. We have a peculiar situation in Nueces River. From its head for quite a long distance it is a free flowing stream, and then it encounters gravel beds and sinks, and we only have water below for irrigation when we have storm-water. We have asked aid and are met with this proposition by the people who have artesian wells: they say that "the water that sinks in these gravel beds is ours, and our source of supply, and you cannot treat that gravel bed and cause that water to take its natural course." The question I want to ask the Judge is, can we by appropriation from our legislature have that water from the Nueces River flow down the natural channel instead of through these gravel beds and all lost?

JUDGE HUTTON: Now, if you follow the rules of California, we have almost the same situation in the Santa Ana River, which as I said before, I diagramed very carefully a year ago.* The delegates will find in connection with my address last year at the Congress, that I devoted some time to that very subject and to the manner in which the Tri-Country Irrigation Association has handled and conserved and made the best possible use of the waters of the Santa Ana River, and in this instance I feel that my proper answer would be to refer the gentleman to that article. You will find a mass of figures there that may help you in your own state. I believe the Tri-Country Irrigation Commission, which is a voluntary Association, composed of gentlemen interested in irrigation from the three counties through which the Santa Ana River passes, is the original developer of water in that particular way. I believe it is the first time in the United States that storm-water has been diverted from its channel, from the rapidly flowing stream, and spread out by artificial means and pond conditions created so as to prevent it sinking underground. Mr. Pinchot visited the work and was instrumental in getting a small appropriation from the federal government to aid in that experiment.

PRESIDENT FOWLER: Now, ladies and gentlemen, we will listen to the next paper of the afternoon, not printed on the program, but one for which arrangements were made previously, provided we did not receive notice by wire or some other way that the party could not be present. The paper is entitled "For a Nation of Little Landers," by William E. Smythe, of San Ysidro, California, or some other place in California. (Laughter and applause.)

*See address by Judge Hutton, Official Proceedings, Eighteenth Congress. P. 183.

Address by
William E. Smythe
of California

FOR A NATION OF LITTLE LANDERS

More than forty years ago George Eliot wrote: "The greatest question in the world is this—how to give every man a man's share of what goes on in life." And she added: "Not a hog's share, and not a dog's share."

I believe the time has come when that question should be answered in America, and that the answer should proceed from this historic Irrigation Congress, which has planted the flag of civilization in the waste places of a continent.

I believe it is possible for us to formulate a policy of creative statesmanship which shall give "a man's share" to millions of men who might otherwise get but "a dog's share."

Let me tell you a story—a true story which ends in the good old fashion: "And they lived happily ever after."

Several years ago I picked up the books of Bolton Hall and some other writers who have been impressed with the possibility of getting a living from a very little land. I went out among the garden homes of the city in which I live and made some amazing discoveries. I found men living on as little as one-quarter of an acre who, if put to their trumps, could not be starved out because they held within their own hands, even on that little spot of ground, the means of existence. I found numbers of people who were getting a large part of their living from gardens and poultry yards on town lots in the heart of San Diego. And I came to the conclusion that Bolton Hall and Prince Kropotkin were absolutely right when they declared that no human being knows the productive capacity of one single acre when cultivated under the best conditions.

I asked myself this question: "What advantage have these city gardeners that thousands might not enjoy if we should abandon the old idea of broad acres and get right down to the amount of land that one man and family can put to the highest uses without hiring help?"

I found they had this tremendous advantage—a market at the garden gate. For them there is no transportation charge and no middleman.

They had another advantage—they were producing the variety of things which they and their neighbors consume every day in the year and which every non-producer must buy.

They were not like the fruit growers of the Pacific Coast, the grain producers of the Middle West, and the cotton planters of the South, who ship nearly all they grow to distant markets and buy nearly all they consume.

This vision rose before me: A new man in our American scheme of life—a man who is self-sufficient on a very little land, who lives next door to the consumer, and who, if he be not in the city, is yet of the city, with all its attractions and advantages. For this new man there must be a new name with a new significance. He is neither farmer, rancher, trucker nor orchardist, in the ordinary sense of the terms.

He is a scientist; he knows the secrets of the soil as no man has ever known them. He is an artist; he creates with his own brain and hands the finest productions of the earth. He is a man of initiative; he carves new pathways for himself and the race. He is an independent, self-employing man; to his trees, his plants and his vines he gives the ineffable touch of love. He is the spiritual man of the soil.

And his name is the Little Lander!

I proceeded to found a settlement to demonstrate that any man can support his family on a little land, and then to see what forms of social and intellectual life would logically evolve from a community so constituted.

The ideal location for Little Landers is at the edge of a great city. Unfortunately, the speculator has gobbled all the edges and holds them out of use, or uses them but wastefully, against the day when growing human need shall multiply their values a thousandfold. But we had to go only 14 miles from the most prosperous city in the United States to find land cheap enough for a group of people with lean pockets and rich ideals.

We could not command capital to begin with. Capital is a good fellow, but it has this failing: it will not help you if you need help. If you don't need help, capital falls over itself to assist you.

Our enterprise seemed so important to the world that we decided it must start. If it couldn't start, that was all the more reason why it should start. So we started, anyhow, and invented a way to get capital. Now we coin our own money as we go along. The method is very simple.

If you assemble a dozen or a hundred families in a vacant field, and they proceed to convert the pasture or grain stubble into homes and gardens, you soon have real estate values. Your unsold property is worth three or four times what you contracted to pay for it. Sell it, and put the money into the common fund, and you will realize the impossible—improvements without taxation. How many hundreds of millions do you think Chicago would have in her public treasury to-night if she had all the increment added to the value of her virgin prairie by the presence of population? Why, there wouldn't be a hungry child in all the town! (Applause.)

I will admit that at the very beginning this method resembles lifting yourself by your bootstraps, but after you get started—after the nucleus of settlement is formed—it works with the accuracy of mathematics.

Of course we had a struggle. Struggle is the law of growth. We went up against that child of ignorance and darkness who is trampled into the dust by the feet of each passing generation, only to show his death's head to the next—the man who tells you: "It can't be done." We confronted prejudice and adverse public sentiment. The details may be left to the historian; the important fact is that we have demonstrated, in a laboratory sense, at least, the fundamental principles of our proposition that "a little land and a living, surely, is better than desperate struggle and wealth possibly." The wide application of these principles is a matter for the patient years.

I am thinking to-night of one grand old man who came to us at the age of 65, with \$250 capital, and who is to-day absolutely independent. I am thinking of others who came handicapped by ill health, and won; of others who came from the walks of professional life, greener than our California hillsides after the winter rains, and became splendidly competent under a system which supplies not merely expert instruction, but the inspiration and example of a whole community engaged in the same quest of beautiful lives. I am thinking of delicate women who have triumphed in the work of the little lands.

Great men and women, they seem to me—great as any of your captains of industry, because they have not only achieved individual independence for themselves, but shown how millions shall one day walk in the sunshine without fear of want.

I am thinking of how the Little Landers have laid that spectre which is frightening the world—the high cost of living. Really, that is a joke to us, in the same class as Halley's comet and Dr. Cook's discovery of the Pole.

A humble house, set in the midst of beauty and fragrance, to which the sunshine, moisture and the air are as kind as to the finest mansion; the cackle of hens, announcing that eggs are still to be had in this country—fresh ones at that; the garden, with its variety of vegetables, berries and fruit.

Under such circumstances the store bill is a mighty small one. Selling direct to the consumer at retail prices and realizing two or three times the ordinary returns under the commission system, it takes but a little from the garden and poultry yard to pay it. I know one man who is doing it on one-tenth of an acre, and he is a man of means who doesn't have to. He has contracted the habit of making both ends meet, and one-tenth of his acre is all he can use to the very best advantage, as yet.

I do not pretend that we have done anything very notable in the way of financial returns from little landing. We haven't reached our days of fine art, by any means. But when I remind you that the average income in the United States is about \$500, you will understand how it can be true that our people, all things considered, are better off than the average. The day will come when a cash return of \$1,000 to \$3,000 per acre, in addition to what the family consumes, will be nothing extraordinary. That will be when soil has been made over into the most perfect condition, and when people learn to produce just the right things in just the right way at just the right time.

I could do the Little Landers no graver injustice than to put too much emphasis on the material side of their life. Of course, we must have food and clothes; we must have a roof to shelter us against the storm and the night. But beyond these physical needs lies a teeming world of interest and of profit.

The Little Lander is not content to cultivate the soil; he cultivates his social instinct, his mind and his soul. Our rude Redwood Clubhouse, with its cobblestone chimney, is a shrine. "For the dear love of comrades" is the legend above its fireplace. We have the New England town meeting, plus initiative, referendum, and recall. We keep abreast of events, of literature and philosophy. We believe that social, intellectual and spiritual culture is indigenous to the little lands.

Out of that little settlement comes the call to a great opportunity. "O, America, because you build for mankind, I build for you."

Thus says San Ysidro to the nation, for the Pilgrim Fathers were no more earnest in their desire to give religious liberty to the world than are the Little Landers to give back to the American people their lost inheritance of individual independence.

This country is in trouble. Millions of its inhabitants are not getting "a man's share of what goes on in life." We have a few hogs. Congress and the courts are engaged in an effort to put rings in their noses. We have a great many men, women and children who are getting a "dog's share." You are going to hear from them—have already begun to hear from them.

Don't you understand?

Don't you know that back of the insurgency in both parties, back of the struggle between labor and capital, back of the mounting votes for the program of social revolution, is the suffering of the masses?

The business interests of Massachusetts recently appealed to the voters of the state to align themselves with the forces of conservatism. And this was their argument: "We are employing 200,000 workmen in our industries and dividing among them in wages the princely sum of \$85,000,000 a year." That is \$425 apiece. The labor bureau at Washington reports that \$900 a year is the least income for which an American family may be maintained in a state of working efficiency.

And Massachusetts—proud old Massachusetts!—boasts of the fact

that she pays her people less than half the necessary cost of their food, clothing and shelter!

What are we thinking of, gentlemen? Are we mad? Do we imagine that a people possessing the ballot will permanently endure such suffering in a land of plenty? I appeal to the prosperous men of the United States to open their eyes—to open the way to the soil—to open the gates of mercy to mankind! And to do so quickly!

How shall this be done?

Is it enough that the nation shall stretch forth its hand and say to the desert: "Be watered!" And to the swamp: "Be drained!" No; that is a necessary part of the process, but it is not enough. That merely prepares the land and does not cover it with homes, as we have learned in the West, and as you gentlemen of the South will learn when the policy of river regulation advocated by George H. Maxwell in his inspiring speech is adopted. And Maxwell thinks in continents, speaks in the language of human epochs. But it is not enough to store the floods.

You remember the French princess who said of the peasants: "If they have no bread, why don't they eat cake?" Many are asking: "If people cannot prosper in the cities, why don't they turn to the soil?"

Let me tell you why: They don't know where nor how to go; they don't know what to do when they get there. They need leadership, organization, instruction. But that is not all.

Vast numbers do not want to remove thousands of miles and make homes in the wilderness, nor is it good public policy that they should. It is just as important that we should reorganize and reconstruct the agricultural life of New England as that we should create a new agricultural life on the dry lands of Arizona and the wet lands of Louisiana.

But I come now to the greatest reason why the people do not go back to the land. They have not the necessary capital. (Applause.) Never mind why—they haven't got it, and so they are hopelessly handicapped. You might as well tell a man to swim with a millstone around his neck, or a horse to trot when securely tied to a post.

They are hopeless slaves of circumstances, and no power save that of the nation is great enough to set them free.

I would have the nation organize the army of peace as it organizes the army of war, and for every dollar it spends on fleets and armies, I would have it spend ten dollars in building homes. (Applause.)

To-day, in every large city, there is a wide-open door of escape for the man who craves security of life. He sees the stars and stripes displayed from an office window, and the alluring sign: "Good income; no expenses; chance to see the world without cost; all social and educational advantages."

What could be finer? Ah, but if you happen to be over 35 years of age, or under 5 feet 4, or if you weigh an ounce more than 160 pounds, the door of hope slams in your face with a bang. The army and navy don't want you.

What about the man who is over-age, under-height and over-weight? Can the nation do nothing for him? Is there no place for him in this world? Can't we enlist him in the work of production, as we enlist the other man in the work of destruction? Isn't the home as precious as the barrack?

I would hang out another of our starry flags, with this legend: "A home on the land for every industrious man and woman; Uncle Sam shows you where and how; advances money when necessary; join the army of peace and get independent." (Applause.)

Why not?

Haven't we encouraged capital by every means in our power? Isn't it just as legitimate to encourage labor?

To the rich men who wanted to build railroads we loaned millions of dollars, and donated 200,000,000 acres of land.

Can't we help a poor man to get a home?

I would have a Bureau of Little Farms, and by the choice of that name emphasize the idea of smaller farm units and more intensive cultivation.

The farther the farm from the market, the larger it must be. Dairy, stock and grain farms should be 40 acres or more; fruit farms, 5 to 20 acres. These will be chiefly among our western mountains, and on the rich reclaimed swamps of the South. A swelling tide of settlers would flow to those regions, blessing the land with prosperity and filling every channel of commerce and trade.

But this is not enough. We must have the nation of Little Landers, a belt of garden homes surrounding every great city in the land. Let me read the words of Abraham Lincoln, addressed to the Wisconsin Agricultural Society, September 30, 1859:

"The most valuable of all arts will be the art of deriving a comfortable subsistence from the smallest area of soil. No community whose every member possesses this art can ever be the victim of oppression in any of its forms. Such community will be alike independent of crowned kings, money kings and land kings."

Until the Little Landers broke the soil of San Ysidro, there never had been an attempt in any part of the world to develop and apply what Lincoln, 54 years ago, declared to be "the most valuable of all arts."

"A comfortable subsistence from the smallest area of soil."

Will you put this priceless boon within reach of millions of your countrymen? Will you give them this in place of uncertainty of employment, of haunting want, of the terror of an unprovided old age? We have reclaimed deserts—we of the National Irrigation Congress—the silent, unpeopled deserts of the West; but the time has come when we must turn our faces to the East, to the North, to the South—when we must grapple with sterner and more cruel deserts—when we must reclaim the social and economic wastes of American city and town.

There is but one way to do it—the little lands. On one single acre of ground in any part of the United States an industrious man can get a better living for his family than half the people of the country enjoy to-day. Will you raise your influential voice in favor of a policy that shall put every man who needs it in possession of an acre-homestead on the borders of Chicago, New York or Boston, of Atlanta, New Orleans, or San Francisco—of every great center of population from ocean to ocean, from lakes to gulf? (Applause.)

It means the restoration of individual independence to millions of men and women. It means a great impulse to business of every kind. It means cheaper and better food to the masses of the towns, who will be brought into direct relations with the producer. It means that existing social discontent shall become constructive rather than destructive. It means a truce in the awful war of labor and capital. It means peace and national progress for a nation that is to-day remodeling its social conscience and reorganizing its economic ideals.

In behalf of the swarming millions who cry aloud for relief from the increasing pressure of life, and especially of those good men and women who have passed the dead line of 45, where no one will hire them, and who, in the struggle of life have been able to accumulate but little for old age—in behalf of these millions I appeal for the support of this policy of social reconstruction.

I appeal to the soul of the nation! (Great applause.)

PRESIDENT FOWLER: The Secretary will read some telegrams.

SECRETARY HOOKER: Telegram from B. A. Fowler, President of the Congress, to Governor George C. Pardee, Oakland, California: "Your telegram read to the Congress which, by unanimous vote,

expressed thanks for your greeting and directed me to assure you of warm wishes for a speedy restoration to your accustomed vigor."

SECRETARY HOOKER: A telegram from Senator Robert M. La Follette, as follows:

TELEGRAM FROM SENATOR LA FOLLETTE

"I regret that work here makes it impossible for me to accept the invitation to attend the National Irrigation Congress. I should count it a privilege to meet the men who are contributing so much to the prosperity of our country by reclaiming arid areas of the great plains through their splendid achievements in the far West. The farmers of the middle and eastern states have learned the secrets of assured crops. The day is not far distant when men everywhere will recognize the importance of reclamation as a broad policy. The federal government has wisely aided the great conservation projects in the West, and I trust in the interests of the American people this policy will be continued and extended to include every worthy undertaking to turn barren wastes into fertile fields in all sections of our country."

SECRETARY HOOKER: Communications have been received as follows:

The Chamber of Commerce,
San Antonio, Texas, November 25, 1911.

Mr. Arthur Hooker,
Secretary National Irrigation Congress,
Hotel LaSalle, Chicago.

Dear Sir:

So far I have not been able to induce any of our men to make the trip to Chicago to represent us at the Irrigation Congress this year and I will undertake again to do it.

You are perhaps aware that the largest private irrigation enterprise in the United States is located just outside of San Antonio. The Medina Irrigation Company is building a dam 170 feet high that will make a lake twenty miles long and irrigate sixty thousand acres of land.

Dr. Frank S. Pearson is at the head of the concern and six million dollars of English capital is invested in it. In two years this project will be under way and will make an attraction that all men interested in irrigation will like to see.

I would like to present an invitation to the Irrigation Congress to hold its next meeting in San Antonio. Of course, I realize that I will not succeed in getting it this year, but I wish to bring the matter to the attention of the Congress and hope to renew the invitation next year and send a delegation to represent us and probably induce the Congress to hold its meeting in San Antonio. I should be pleased to hear from you in this matter. I enclose a formal invitation and will ask you, if possible, to present it to the Congress.

Very truly yours,
JOHN B. CARRINGTON,
Secretary.

The Chamber of Commerce,
San Antonio, Texas, November 25, 1911.

To the Officers and Directors of the National Irrigation Congress, in Convention at Chicago.

Gentlemen: On behalf of the business interests of San Antonio, speaking through the Chamber of Commerce, I desire to extend to the officers and members of your association a cordial invitation to hold your next annual meeting in the city of San Antonio.

This city is the ideal convention city of the whole Southwest. In

historic interest and picturesque beauty it has no equal in America. The Alamo, the cradle of Texas liberty, the ancient Spanish Missions, and other places that are landmarks in our nation's history, are here.

San Antonio has the finest hotels in the South, affording accommodations for 25,000 to 30,000 tourists every winter. It has beautiful parks and plazas, 185 miles of splendid roads for automobiling, riding, churches, theatres, and all the city attractions.

The latchstring is out and you will be welcomed by a hospitable citizenship. The Secretary of the Chamber of Commerce will be glad to attend to any of the details of arrangement for you.

Hoping you will give this invitation favorable acceptance, I have the honor to remain,

Very truly yours,

JAKE WOLFF, President

Citizens' Business League,
Milwaukee, Wis., December 7, 1911.

Mr. Arthur Hooker, Secretary, National Irrigation Congress, Hotel La Salle, Chicago, Ill.

Dear Sir: The Citizens' Business League takes pleasure in extending a cordial invitation to the National Irrigation Congress to hold its next meeting in Milwaukee. We believe this invitation should appeal to your organization from many points of view.

The location of Milwaukee is central. It is mid-way between the East and the West. Chicago is the great railway converging point of America, where the lines from the East and the South and the West terminate. Milwaukee is within one and one-half hours' ride of Chicago, with hourly train service. In a word, Milwaukee is easy to reach, and it has all the railway facilities of Chicago.

The City of Milwaukee, while having all the facilities to care for your conventions, is still not so large as to tend to have your organization lost in the metropolitan stress of life. A National Irrigation Congress held at Milwaukee would be a big thing in this city, and it would receive far more publicity than if it were held at a smaller town. There is the further fact, that a Congress of this character held here would bring the irrigation project of the far West in closer touch with the middle West and the East, with their vast populations.

Milwaukee's hotel accommodations are ample and excellent. Our new Auditorium is an ideal structure for convention purposes. If you desire to make a great exhibit in this Auditorium, the facilities are there, and the space is available.

It would be a great pleasure indeed to meet you and greet you at Milwaukee in 1912.

Yours very truly,

F. A. CANNON, Secretary.

San Francisco Convention League,
San Francisco, Cal., October 27, 1911.

To the National Irrigation Congress, in session at Chicago, Ill.

Gentlemen: We hereby extend to the National Irrigation Congress a most hearty and cordial invitation to hold their next convention in San Francisco. On behalf of the people of this City, we wish to assure the delegates and their friends a most royal welcome.

The proverbial hospitality of the "City by the Golden Gate" has been enhanced by the great demands made upon it in the rebuilding of a splendid modern city. The wonder-working energy which has brought about results of such deep interest to all observers will only find additional field for its exercise in taking care of and providing entertainment for the delegates of your organization and their friends.

Climatic conditions and the many natural wonders so near to San Francisco's door will prove items of additional interest to all prospective visitors, not to mention the famous attractions within San Francisco herself and also a sight of the Exposition buildings well under way, enabling those who attend the Convention to secure an idea of the magnitude of what the Fair will be. All these things we wish to place at your disposal, feeling that if this point be selected and visited, it will prove one of universal satisfaction.

The railroads have granted to the National Educational Association Convention to be held here the rate of \$62.50 from Chicago, and \$50.00 from Missouri River common points, and we are sure that they will grant your organization the same rates. We can also assure you of low hotel rates, and low rates for sight seeing trips around San Francisco and the Bay, and ample hall accommodations for the holding of conventions.

Trusting that your organization will select San Francisco as their next meeting place, we are,

Very truly yours,

SAN FRANCISCO CONVENTION LEAGUE.

FELTON TAYLOR, Secretary.

Houston, Texas, Dec. 5, 1911.

Robt. H. Kern,
National Irrigation Congress,
Chicago, Illinois.

The Chamber of Commerce, joined by the Governor of Texas, our Honorable Mayor and the President of the Cotton Exchange, beg herewith to extend a most cordial invitation for your Association to meet in Houston in 1912. First class auditorium and hotel accommodations. Kindly wire, my expense, result of your deliberations.

ADOLPH BOLDT,

Secretary Chamber of Commerce.

PRESIDENT FOWLER: Gentlemen, the next on the program is the Call of States, "Five minute responses by representatives chosen by their respective delegations."

ALABAMA

PRESIDENT FOWLER: Mr. T. B. Woods will speak in behalf of the Alabama delegation.

MR. T. B. WOODS, of Alabama: Mr. Chairman and gentlemen of the National Irrigation Congress: Irrigation is a new feature in our country. We undertook it about two years ago and we have been so successful during the last year that I think we will have more representatives in the meeting of the Irrigation Congress next year. We raise mostly cotton in our country and we are going to attempt to irrigate for the raising of cotton and see if we cannot make more cotton to the acre, and also more corn to the acre with irrigation. I am very glad to be here to-day. Unfortunately, I am the only one that is here from Alabama. I would like to extend an invitation to the Congress to hold the next meeting in Selma, Alabama. (Applause.)

ALASKA

No response.

ARIZONA

PRESIDENT FOWLER: Ladies and gentlemen, Governor Sloan will respond in behalf of the Arizona delegation.

GOVERNOR SLOAN, of Arizona: Mr. President and members of the National Irrigation Congress: Arizona is so ably and creditably represented in this Congress in the person of the distinguished President of the Congress, that I feel that I ought not to take up your time by any additional presentation of anything which Arizona may have to present. As you may well understand, the people of Arizona are just now in an enviable state of mind. After twenty years of waiting we are just about to enter the sisterhood of states. (Applause.) In addition to that, largely through the activities of the National Irrigation Congress in the past, we are confidently expecting an era of great prosperity.

We are conservationists in Arizona, and we do not seriously object if that word is printed in capitals. I want to tell you deliberately why we are conservationists. It is because we have seen the good results that have followed from the conservation movement. We have seen the good results that have come from the Geological Bureau of the government, and I may say also, and this is something which may surprise you—we have seen the good results from the Archaeological Bureau of the government, because we have, as you may understand and may know, prehistoric relics and such as that of great interest to the archaeologists.

We are also firm believers in conservation as represented by the Forest Service. I am sorry that Mr. Pinchot is not here, so that he might hear this expression of our views upon that subject, but especially are we conservationists when we contemplate the good results that have come to us from the reclamation policy as expressed in the National Irrigation Act.

Perhaps we are in a position to state and to bear testimony as to the good results that have come from the National Reclamation Act better than any other state or territory in the West. Our projects are perhaps further advanced than those of any other state or territory in the Union. We are conservationists therefore, because our experience teaches us that through the beneficent policy which the government has adopted, largely, as I say, through the instrumentalities of this Congress, we are representing the harvest, and it is a rich harvest.

I want to say, further, that as the result of this experience our sympathies have been enlarged. We are ready now to back up, when we become a state, through our representatives in Congress, any measure looking to the extension and enlargement of this national policy of reclamation, whether it be in the form of—

PRESIDENT FOWLER: The time of the Governor has expired.

On motion, duly seconded and carried, the time of Governor Sloan was extended.

GOVERNOR SLOAN: I thank you. I did not expect to make a speech when I got up here. The subject is an interesting one, and I just want to say one or two words in addition. We are so much impressed with the value of national reclamation that we wish to see it extended and enlarged so as to include not only the arid lands of the West, but the swamp and overflowed lands of the South, and I think we are warranted in stating that we are in hearty sympathy, and I think our representatives in Congress will demonstrate that when the time comes, for any such policy as outlined in the Newlands Bill, for the storing and impounding of the head waters, the streams that flow into the Mississippi River, not only for the purpose of developing power, if that be possible, but for the purpose of conserving to the nation those rich lands along the lower delta of the Mississippi.

I was very much interested in the presentation of the cause of the "Little Landers," by the gentleman from California. It is a

beautiful scheme that he has outlined—perhaps a Utopia in a sense, perhaps not—I am in sympathy with any movement that will bring the people of the cities, the surplus populations of our towns and cities to the country. I was amused at his statement that he thought one acre was quite enough to support a family in California. That struck me as strange. Well now, if he will only come down to Arizona, we will demonstrate to him, without question, that a family can be maintained on the product of one date tree. We had one tree in our capitol grounds last year that produced between three hundred and four hundred pounds of delicious dates that could have found a ready sale in our home market at 35 cents a pound. On the one acre, if one tree is sufficient—(laughter and applause). But seriously, I am in favor of any policy, the expenditure of money by states or otherwise, that will make it possible for every man in this country to own one or even ten acres of land. That policy as I believe it is the National Reclamation policy—and I want to state for the benefit of any hard-headed business man who may have some serious doubt as to the propriety, if not the wisdom, of the national government going into this business of reclaiming arid lands—and I will state a concrete example, and then put a question: Within the Salt River project, it is a safe and conservative estimate that 20,000 families may find homes on lands in sufficient quantity to insure them a good livelihood. If that be true, is this good business policy for the nation to loan \$10,000,000 in order that homes for 20,000 people may be found, rather than that these 20,000 families in search of lands should cross our borders and go into Canada or into the Republic of Mexico, as they are now doing?

That is the situation, and it does seem to me that the argument is unanswerable, that it is for the business interests of this country—if I may put it that way—it is for the material interests of this country that additional homes be provided for the surplus population of this country, and there is no way in which that can be done—our public lands are pretty nearly exhausted—except by reclamation of our arid lands, and also by reclamation of our swamp and overflowed lands.

We are not very much concerned in Arizona about this question, whether this matter of conservation shall be conducted by the nation or by the states. Of course our experience thus far has only been along the line of national conservation. We are only concerned with results, and that the largest results shall be obtained from the minimum expense. (Applause.)

Now, I have said about all that I care to say, simply an expression of our confidence and our sympathy with the work which this Congress is endeavoring to do, to-wit: to foster and keep alive in this country a sentiment in favor of reclamation of our arid lands and in the reclamation of the swamp and overflowed lands, if that be included in our purpose and aim. Such a result is worth working for; as citizens of this country every man engaged in this work ought to take a pride and satisfaction in it. I know he will take a pride and satisfaction in the results accomplished if he will come down into the Southwest, into the Salt River Valley, or in the Yuma Valley, and see what has been accomplished through the National Irrigation Act. I am satisfied that anyone who will investigate conditions there will be more than ever an enthusiastic supporter of the Reclamation Act.

You may have heard some criticism from our section with reference to the Reclamation law. I want to tell you that those criticisms are not directed toward the law as a whole. They may be directed, and possibly are directed, toward some details of its administration. What we simply want is the present act strengthened and improved in parts, in which actual experience has demonstrated that that act

does need improvement and amendment. Thus strengthened and amended, we will be back of it, we will continue to be back of it until every acre of arid land in the arid West capable of reclamation is reclaimed and homes thus furnished to the millions in the east who are seeking homes upon lands such as have been described by our friend from California. (Applause.)

I thank you for this added time. I have stated all that I care to state with reference to the attitude of the section which I have the honor to represent. We are with you in this Congress, and we hope that at some future time the Congress will convene in one of our southwestern cities, Phoenix, I hope. (Applause.)

PRESIDENT FOWLER: Arizona and her lover (pointing to Governor Sloan). (Applause.)

I recall, about a dozen years ago, when I first went to Arizona to live, a friend in this city said to me—a successful business man of intelligence and education, strange as it may seem—“Why, I am surprised that you have gone down to Arizona to live. I always thought and I understood that Arizona was fit only for Indians, Cowboys, Mexicans and Niggers to live in.” I hope you have a different impression from my friend who was frank enough to tell me what he understood the Southwestern country was fit for. (Laughter and applause.)

The secretary will call the next state.

ARKANSAS

There was no response to the calling of Arkansas.

CALIFORNIA

PRESIDENT FOWLER: Mr. C. B. Boothe, of California, ladies and gentlemen. I am as glad to welcome him as anybody could be, even from California. Won't you come upon the platform?

MR. C. B. BOOTHE, of California: The California delegation delegated its chairman to speak for them, during these five minutes. But on account of a bad throat he is not able to respond. So we have asked Judge Hutton to respond for California.

PRESIDENT FOWLER: Judge Hutton, gentlemen.

JUDGE GEORGE H. HUTTON, of California: The reason the chairman of our delegation asked me to speak was because he thought I was talked out, and out of the twenty-four or twenty-five delegates from California he thought I would make the shortest speech, but I may deceive him. I am glad to be here and have an opportunity to speak on behalf of California. I am proud to represent that great state, but, ladies and gentlemen of this great Congress, I am more proud at this particular time and under the particular circumstances that exist, to represent the city of Los Angeles. The word that has come from that city which in a sense has been a storm center—the word that has come from that city twice within the last week has caused me to bow my head more reverently than I have been wont to do and acknowledge that there is a Providence that controls and regulates the destinies of this great nation. (Applause.)

I am not going to advertise California, but I am going to act upon one or two suggestions that have come to me since I have been in Chicago, and right here I want to say that when I came into the room this morning and heard our President reading from a newspaper clipping the misrepresentation of this Congress, I was astounded. Chicago is the last place in the world to adopt the theory, “As it was in the beginning, it is now and ever shall be.” There is no more progress in any city on this continent than Chicago. I my-

self have had unusual and remarkable courtesies and opportunities extended to me in this city. I have been out with your Superintendent of Parks and have seen the most wonderful park system that I have ever seen, and that, to my mind, answers the question of establishing what shall be "The Poor Man's Club" in place of the saloon, and I have been shown clubs that any man might be proud to belong to, and it was a revelation to me. I have been the guest of Judge Pinckney of the Juvenile Court; I have seen the wonderful operation of that institution; I have been to Hull House, and I think that is one of the most remarkable things that Chicago has. By the courtesy of that remarkable woman, Mrs. Ella Flagg Young, I have seen the public schools, the open-air schools, thrown open to me, where children work in the open air, and I am going back to California and tell them that the place to conduct their schools is in the open air. By open air I mean such as they use with one side generally open, buildings or schools in such a way that one room will have one side entirely devoted to windows, and where you keep those windows open. The results that I have seen here are astounding. It is not because Chicago is not progressive, but it is because Chicago had not, until this morning, caught the spirit of this Congress. I believe when Mr. Maxwell addressed the Congress this morning they caught the spirit, and will see very different results in the future.

I thank you. (Applause.)

At this time, President Fowler called upon Judge Fairweather of California, fourth vice-president of the Congress, to take the chair. Accordingly Judge Fairweather of California acted as temporary chairman of the meeting.

CHAIRMAN FAIRWEATHER: The Secretary will continue the call of states.

COLORADO

MR. JOHN E. FIELD, of Colorado: Mr. Chairman, ladies and gentlemen: I wish to paraphrase somewhat an Ode to Scotland as a starter. "Statesmen, scholars, divines, heroes and boys: do you wish to be exemplars worthy of imitation? Go to Colorado!" (Applause.) I would add more and say, "Engineers, lawyers, business men, farmers, those seeking health, wealth and happiness, go to Colorado." Having delivered my peroration first, I will now come down to a few facts.

Do you know that the supposedly highest development of irrigation law is founded on the experience of Colorado? Do you know that one of the greatest, if not the greatest irrigation engineer of the United States, Mr. James Dick Schuyler, cut his eye teeth in the sixties in Colorado? And do you know that Elwood Mead, than whom there is no better authority on irrigation law and practice, made his first mistakes and learned how to correct them there? That, as an administrative officer of water subjects, Clarence Johnston has made a national reputation, and he was born in Colorado?

So much for products in Colorado, as to men. Colorado has probably the highest priced land in the United States. In one district the values range from \$2500 to \$4500 per acre, and one eight-acre tract that I was instrumental in securing as a right of way cost us \$48,000, and there was not a building on it. We have some of the great irrigation structures there. Probably the longest irrigation tunnel in the world is there, and I wish to say here that a Colorado man located and started that tunnel. We have one of the greatest masonry dams in the world and we have what is said to be a dam that contains the most yardage; but I don't think that is anything to recommend it, because it costs more money. But we have what

is the highest earth dam, 180 feet high, and it will ultimately be 237 feet high.

To the farmer we can show a few things and also to the engineer; and I want it understood here, and especially by the engineers, that we can show you how not to do things as well as how to do them, and the mistakes that have been made in the last few years in Colorado are simply a repetition of the mistakes made thirty or forty years ago, and they were made by men who failed to spend a sufficient time in Colorado before they attempted their work.

Colorado has the greatest area of irrigated lands. Now as to the laws: Fourteen years ago, before the Irrigation Congress in Cheyenne, I held forth at great length condemning Colorado irrigation laws. I thought I was right, and as I have read literature, I have found that Colorado irrigation laws were held up as terrible examples. But having lived under the laws of both Wyoming and Nebraska, and having practiced in New Mexico and Utah, I will say that for practical working, the Colorado law is superior to all or any of them.

I wish to say in conclusion that Colorado sits in a unique position, on the crest of the continent, and that all Colorado asks is a square deal, and all that we ask is that the interstate waters be adjudicated in accordance with the priorities; and if that rule is held to, we will have all the water we want.

As I say, Colorado sits on the crest of the continent, like Jove upon Olympus. I Consider Colorado the king. So let us sing—

“Long live the King,
 “Long live the Queen and Jack,
 “Long live the ten spot and the ace,
 “And also all the pack.” (Applause.)

A DELEGATE: The Committee on Permanent Organization is to meet at five o'clock. The chairman of the Oregon delegation is on that committee. I would suggest that the Chair vary the order and allow the gentleman from Oregon to speak at this time.

CHAIRMAN FAIRWEATHER: We will hold the meeting open until 5:15 or 5:20, or later, if necessary.

A DELEGATE: I move that the Congress now permit Mr. Tom Richardson of Oregon to address the Congress.

The motion was seconded and unanimously carried.

MR. TOM RICHARDSON, of Oregon: Mr. Chairman and gentlemen of the convention: I thank you very much indeed for this special privilege. I haven't anything special to say in reply, except this: that Oregon has been the leading state in furnishing the money for irrigation, thirteen per cent of it, and she has only had 4.2 per cent of that money. Now, I don't blame anybody for that, nor does Oregon blame anybody for that. We of Oregon are glad to see the money that we get out of our government lands go to other states of the West like Arizona and New Mexico. We feel that irrigation, or the funds for irrigation, should be kept separate from those for drainage, and we are glad to know that that is the sense of this convention.

The people of my state are so intensely prosperous that probably their neglect is as much to blame as anything else for their not having the amount that is due them from irrigation. We have been treated fairly and nicely by the government, but now we want a little consideration, and we want to sit at the family table and get a little of the roast beef that the other fellows are having passed around.

Oregon has no story to tell of her special attractions except that those of you who have been there always come again. You are sorry that you cannot live there, and really we get down on our knees every night and pray to God that he may give a few of the blessings

he is giving us every day to the balance of the people once in a while.

Now, come and see us. Bring the rest of the people with you, bring them where the roses bloom and the apples grow, and where everything in nature reaches its climax.

I have not much to say except that I hope this Congress with its great work and its great history will after this realize that the good in the United States is outside of these great big towns where it is so fascinating that it makes the irrigator marvel and he can not get around, and I say, let us stay away from Chicago and keep staying away from Chicago as irrigators, hold our Congress somewhere else, but meet here on some other occasion when the wonders of the great city will not take our minds from our work. This is no place for an Irrigation Congress; there never has been 100 people in this house. I thank you. (Applause.)

CONNECTICUT

MISS SANFORD, of Connecticut: Mr. President, Ladies and Gentlemen of the Convention: Connecticut has given way with pleasure to Oregon, the great state; Connecticut wishes to say that having given her best in the years past, and having furnished of her sons and daughters for the settlement of the western country, she is quite willing you should allow the representative of the great state where many of her children have gone, to come forward and speak for them.

I think Connecticut has acquired much information of value from the meetings of the National Irrigation Congress, and still has opportunity to acquire more wisdom. Connecticut wishes to help bring our land to its highest development and give her support to the helpful suggestions offered at this Congress. And Connecticut after three years attendance at this Congress has come to the wise conclusion that her state would offer a most useful and remunerative field for carrying out the ideas of the various experts which she has listened to. An educational propaganda for these new methods should be inaugurated which would be of benefit to the small New England states, not forgetting New York, and further aid what the Irrigation Congress stands for, and further the wishes of the western states in obtaining settlers. Unless we have some field which we New England and eastern states can follow we cannot attract our people's attention to this work so closely. We must find some way to interest them in our Congress.

To quote from our President's speech, irrigation, reclamation and conservation have furnished the forces which have reclaimed the desert for homes. Connecticut's representative wishes to say also that in studying this irrigation problem, she has been for her state, speaking personally, visiting a great many of these projects and has widely traveled with the hope that she might return and bring the matter before the Governor and her own fellow citizens and interest with her own the Governors of other New England states, in a concerted effort to send citizens out there.

In looking into the matter she discovered it was in the hands of the railroads and there was no aid offered to the future settlers, the people who remained on the land. Therefore, she returned with no hope of success, with the thought in her mind that it would be much better that they remain in their own country, in their own little state.

We have given millions to reclamation, we have given millions to conservation, but what have the millions we have given availed the people to bring them to this land? Now, we might wisely have looked into what the railroads in Canada, the railroads in the great Northwest have done. I think they aided in solving the problem very much. You remember that they will encourage and help people secure a home,

and then if a man is not satisfied with his home that they build they will then change this house to some other locality and give him the difference between the two houses, and also help in other ways. We should earnestly consider what has been given to encourage and assist people in coming to this country. (Applause.)

DELAWARE

No response.

DISTRICT OF COLUMBIA

No response.

FLORIDA

No response.

GEORGIA

CHAIRMAN FAIRWEATHER: Ladies and Gentlemen, I have the pleasure of introducing to you Mr. George M. Johnson, of Georgia.

MR. GEORGE M. JOHNSON, of Georgia: Mr. Chairman, Ladies and Gentlemen of this convention: I come before you with greetings from Georgia, the Empire State of the South. I represent Georgia in general, and I represent the Chamber of Commerce of Savannah in particular.

Georgia we all know in the South is a great state. All over the United States it would be recognized as a great state provided we could get you to come down there and let us show you. I am not going to talk anything about Georgia's undeveloped resources, but there are a few phases of a topic that has been brought out here in the papers and discussions during the past two or three days upon which I wish to comment a little bit.

In Georgia, and I am afraid it is true in too much of the South, and especially the Southeast, we look upon the Irrigation Congress and the irrigation work as something having no part or parcel in our welfare. Now I have caught a broader view since I came here, and I am only sorry that we have not 100 representatives from my state to catch the same view.

Irrigation and drainage must go hand in hand. Now we know that Georgia legally is a dry state. It may be, I think, absolutely proper for me to say that we need some irrigation. They tell us that the laws are not strictly enforced, and so it may be proper for me to say that we need some drainage.

Now, just one word in regard to what drainage and irrigation may mean to us, and as to what the proposition to store up the water at the heads of our streams to prevent floods may mean to us, and not only to us, but to the State of South Carolina to the east, and to the State of Alabama on the west and the state of Florida on the south.

Along certain streams, the Savannah river, the Ogeechee and other rivers flowing through Georgia and draining some of the South Carolina territory, and the streams draining some of the Alabama territory, we find almost from one end of these streams to the other in the lowlands abandoned rice fields, fields that in fact years ago were the sources of a mixed production. They have been abandoned because of recent floods and overflows. The crop is uncertain, not because the crop was unprofitable when it could be grown and handled without being destroyed by floods, but the floods rendered the crops uncertain. These lands, if proper attention was paid to a system of dams and reservoirs toward the head of the stream, these lands would again come under cultivation, perhaps not for rice, but in something else that would make the state much money.

We raise a hundred and fifty million dollars worth of cotton every year. We ship practically all of that cotton out. We have untold undeveloped water power there. The damming of the streams would develop this power. It would enable us to convert that hundred and fifty million dollars worth of raw cotton into three hundred million dollars worth of manufactured cotton.

Of course it would not all come at once, but it would come in course of years, in the course of one or two generations.

With that view before us, can Georgia, can the people of the South, can any people of the United States afford to stand in the way of irrigation and drainage and flood protection work? Georgia will not stand in the way of it, and no state will stand in the way of it when they see these matters in the proper light.

Now if you want to know anything about Georgia's resources, come to us and we will show you, whether you are from Missouri or not. (Applause.)

HAWAII

No response.

IDAHO

No response.

ILLINOIS

No response.

INDIANA

CHAIRMAN FAIRWEATHER: Ladies and Gentlemen, allow me to introduce Mr. Roebuck of Indiana.

MR. W. S. ROEBUCK, of Indiana: I am sorry the state of Indiana has been deserted this afternoon by everybody except myself. There are some four or five delegates from there, and there was one of them chosen to speak for the State of Indiana. I came here, and I thought it would not do to altogether desert Indiana.

Now I am a practical gardener, and there are just a few things I want to say about Indiana. We can not boast any large dams or great irrigation projects. We can not boast of men who have taken a great part in this Irrigation Congress, but I think that we can show the people of Indiana and of Illinois, and of most of the states east of the Mississippi river that they need not cross the Mississippi to see maximum crops grown.

I noticed to-day the gentleman who spoke from Wisconsin, I can not recall his name, about irrigation in the humid states. He missed the State of Indiana entirely. He skipped clear over it. He mentioned New Jersey and Georgia and, I believe Alabama, and he missed our state entirely. Well, we have been irrigating in and about Fort Wayne for the past ten years, and we find it in the East a very complex problem, because we have problems to contend with in the East that you have not in the West. One of them is the drainage problem, and the other is the copious rains that are liable to follow irrigation.

Now, the only thing I can give you is a little bit of personal experience which has come under my own observation in the line of irrigation near Fort Wayne. I know of an irrigated farm of 80 acres, and there is not more than half of this farm, or there is less than half of this farm that has been cultivated annually, and the products have been over \$15,000.00 annually.

I say this to encourage people east of the Mississippi river. Irrigation in the humid states is not an experiment. It is a demonstrated fact that every crop that we grow can be more than doubled, take it one year with another, by irrigation. (Applause.)

JUDGE FAIRWEATHER: I would like to ask the Secretary to call Pennsylvania, as Mr. Maxwell desires to get away.

At this point President Fowler resumed the chair.

PRESIDENT FOWLER: If there is no objection the delegate from Pennsylvania will now have the floor.

PENNSYLVANIA

MR. GEORGE H. MAXWELL: Mr. President and Gentlemen of the convention: The convention has been so arbitrary and close-fisted with me in limiting my time to such an extent that I have already spoken for only about two hours. I hesitate to take up another five minutes, but I wish to say just a word to you from Pennsylvania, as that state has been reached on this call of states.

As I was leaving my office in Pittsburgh I received a letter from Chancellor McCormick of the University of Pennsylvania, asking me to represent the University at this convention, because the gentleman he had previously had in mind was unable to come. I brought along the credentials he sent me and filed them with the Secretary of the Congress, so in addition to representing Los Angeles as a member of its chamber of commerce, I am also a duly accredited delegate from Pennsylvania. I mention this in order that you will understand I do not speak for Pennsylvania without authority.

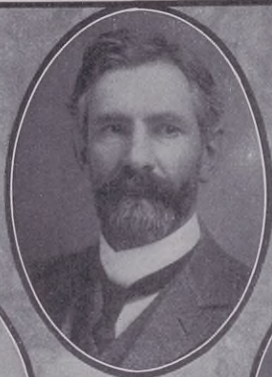
I have spent the most of my time in Pittsburgh for the last year and a half and as Executive Director of the Flood Commission of Pittsburgh, and am in a position to speak with personal knowledge as to all I have to say to you from that state.

I was amazed when I went to Pittsburgh to find how closely they are identified with the great questions of conservation and forest preservation and even irrigation—things which we are inclined to look upon as distinctly western questions.

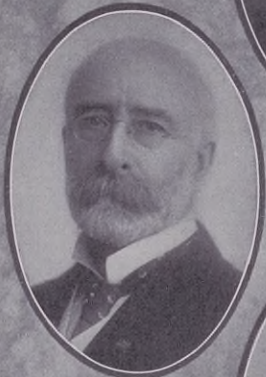
Pittsburgh occupies a peculiar position with reference to its relations with other sections of the country. It is to a large extent the Great Central Power Station of the United States. Vast barges carrying thousands of tons of coal go down the Ohio River—go down to furnish light and heat and power that provide for the industrial prosperity of a great many other communities. The machinery that is going out into the West to harness the waterfalls and develop electricity comes very largely from Pittsburgh. It was a great gratification to me when I got there to find the real warm-hearted feelings of the citizens of Pittsburgh for the whole West and the whole South. In fact they are up in arms on these very questions relating to water control that are so vital to us of the West, and which are also so vital to the people of the South.

Tuesday of last week I went to Washington with a delegation of three carloads of Pittsburgh business men and acted as their spokesman to present an application to the President for aid in securing \$2,700,000 to go into the fund to be distributed by the Appalachian National Forest Commission, because it had lapsed back into the Treasury owing to unavoidable delays in the administration of that law. We asked to have that \$2,700,000 restored to the Fund. This great appropriation is for the purpose of creating and preserving the natural reservoirs and improving the navigable streams. We also asked for his approval and co-operation of our advocacy of the enlargement of the policy of building artificial reservoirs to regulate the flow of navigable rivers and prevent floods.

Last Monday evening, it was my pleasure as a member of the Pittsburgh Chamber of Commerce, to attend the banquet extended by that body to the delegates from Louisiana and Texas, who were members of the Intercoastal Canal League that they have formed



R. Insinger.
Chairman.



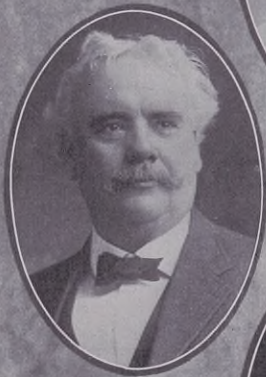
B. A. Fowler.
President



Arthur Hooker.
Secretary



R. R. McCormick.



Dr. W. J. McGee.



W. S. Hopewell.



W. G. DeCelle.

BOARD OF GOVENORS
Nineteenth National Irrigation Congress

in those states. They were on their way to Washington to attend the National Rivers and Harbors Congress. The great banquet hall at the Fort Pitt Hotel was filled with Pittsburgh's business men extending the hand of welcome and wishing Godspeed to the people of the South on their way to Washington to attend this River and Harbor Congress.

Pittsburgh has one of the most magnificent halls in any city of the United States. That beautiful Soldiers and Sailors Memorial Hall near the University of Pittsburgh and the Schenley Hotel. It has some of the best hotels in the United States. It has wide-awake business men whose interests extend over the entire United States from one end of it to the other.

Now I am not going to make an application to you to send this Congress to Pittsburgh, because I know there is a strong feeling in the Congress that it is better that it should return to the West. If that be your judgment, I do not propose to differ from it at all. But if the time should ever come when you should think that it would strengthen this organization and movement to go still farther East, not to Chicago, but to go clear back east into the mountains, into the Appalachian region, to the headwaters of the Ohio river where we could bring together the New England States and the Great Central States and the South, Ohio and Indiana, and Kentucky and Tennessee, and North and South Carolina, and Virginia, and add their influence to the delegations that would come from the West, and converge them in a great congress at Pittsburgh, I want to say to you that, if that time comes, Pittsburgh will extend to you the heartiest welcome that any city of his nation ever extended to the National Irrigation Congress. (Applause.)

PRESIDENT FOWLER: If there are any other members of either Committees, of either the Permanent Organization or the Committee on Resolutions, who is delegated to speak here this afternoon they will be given an opportunity if they will make themselves known. The work of the Permanent Organization Committee and of the Resolutions Committee is important, each of them has important work—and members of the Committees ought to be present. If there are any, let them rise and make themselves known. If not, we will call upon Iowa.

IOWA

MR. R. W. LAMSON, of Iowa: Mr. Chairman and gentlemen: I came in at 7:00 o'clock this morning. This is the first meeting that I have ever attended. I looked around amongst the delegates present here from the various states, and I didn't see anybody else from Iowa. I would like to ask a question: Is there anybody else here from Iowa?

PRESIDENT FOWLER: It has been suggested to me that Iowa has been losing population right straight along, and that possibly is because they do not irrigate. The secretary says there are twelve registered from Iowa.

MR. LAMSON: I like the spirit of this convention very much: I think the spirit of the law in California, where one man does not take any more land than he ought to, is a little different from the Iowa hogs—and I seem to be trying to "hog" the delegation from Iowa. I also like the spirit of the man from San Diego, who thought one acre of land was enough for anyone.

I have eleven children at home, and I have almost had nervous prostration about whether they would be able to make a living; but since this gentleman said that a man could live on a tenth of an acre of land, with that problem nearly solved, I do not believe I will have any more of these nervous prostrations. (Laughter and applause.)

Some of you fellows have been talking about making a living on an acre or two of land—I will not go back on Iowa altogether—and the Governor of Arizona said that they could live off of a date tree out there. At one time I lectured before the Farmers' Institute of our country, and my theme was, "How to make a living for eleven children and work all the time for the public for nothing." (Laughter and applause.) I have done that, and I haven't any date tree either. (Laughter.) The spirit of this convention is good and it reminds me of a little piece that I was taught when I was a boy.

"Better than grandeur, better than gold,
Better than rank or title a thousandfold
Is a healthy body, a mind at ease,
And simple pleasures that always please,
And to share each joy with a jingle of gold
With sympathies large enough to enfold
All men as brothers is better than gold."

MR. F. P. COSTELLOE, of Iowa: Mr. Chairman, we don't want to take any more time than belongs to Iowa, but we might call your attention to the fact that one of the papers presented this morning was from a man of that state, on "Irrigation in the Humid States." That simply illustrates the attitude of a good many of the agricultural interests of the state of Iowa at the present time toward irrigation. I might state as a compliment to the people from Colorado, that I have had several years experience with Colorado irrigation laws, and really I am more of a Coloradoan than I am an Iowan. To my knowledge there are no irrigation laws in the statutes of Iowa. We will not be surprised if there are some such statutes in the Iowa laws before many years. We all know that if any interests of any extent involve the legal side of the question, I think it is only a matter of a short time until we find that not only in Iowa, but practically in nearly all of our Mississippi Valley states, some laws pertaining to irrigation must be enacted. I might say, as an apology, that the member who was supposed to speak on the floor this afternoon is not present. (Applause.)

KANSAS

MR. R. H. FAXON, of Kansas: Mr. President and delegates: Kansas has always been in the irrigation movement. When the first session of this Congress was held, twenty years ago, Kansans were in that congress and they have been active in it ever since. At one time some of the leading officers of the Congress were from that state.

Kansas was active in the enactment of the Reclamation Act. Kansas had a chairman on the committee on irrigation in the House of Representatives and has had members of that committee in the Senate, and has had very much to do with the legislation in the Federal Congress that has led up to the development of the West through reclamation and other acts pertaining to irrigation.

This has not been confined alone to that portion of Kansas west of the 100th Principal Meridian on the western third of the state, which is irrigable, but is confined to the rest of the state as well. Possibly that is due to overflow questions and gardening questions, such as our friend from Indiana spoke about, in the eastern part of the state and other sections. Perhaps it is due to the activity of the State Agricultural Colleges. Kansas also has a state irrigation and drainage engineer, under the auspices and supervision of the Agricultural College, and therefore, that has had very much to do with the progress of irrigation and the interest in irrigation throughout the state.

We also took advantage, Mr. President, of the resolution that was projected from the Resolutions Committee and adopted publicly last year, looking toward co-operation by the state in reference to irrigation and surveys, and our state legislature last year, due possibly to the activity of those who were there in the Pueblo Congress, passed acts for irrigation in this association and water surveys, in co-operation with the work of the general government along those lines. I mention that to show that the effect, the work and suggestions of this Congress are seized upon by our state at every opportunity, and not only by the irrigable portion of the state but by the state as a whole, where these problems have a greater or less interest and become necessary from time to time.

The state of Kansas has been paying great attention recently to pumping, and the section of the state from whence I come, the town from which I come, Garden City, and that district, well known throughout the West by means of its pumping endeavors—that industry, that phase of irrigation has led all of the rest, and it is no uncommon expression to find men talking about bringing in wells, just the same as any oil wells, and it is a common thing to hear about wells being brought in. It is that way in the pumping section of Kansas, the center of which happens to be Garden City and that immediate territory.

The state of Kansas is interested in all development problems, interested in all agricultural problems—the educational side, the development side, is well to the front in that state, because of the State Agricultural College, the State Board of Agriculture, the general interest and public spirit of the citizens who comprise delegations to this and other useful gatherings throughout the country, furnishing to the United States Department of Agriculture, to the Reclamation Service, to the Forest Service, to every national field of human endeavor, some of its former students and some of its former members—thus demonstrating the interest of the state of Kansas in all these things. I thank you. (Applause.)

KENTUCKY

MR. W. M. REID, of Kentucky: Mr. Chairman and Gentlemen of the Congress: I desire to make a short explanation on behalf of Kentucky. I occupy now, and have since I have been at this session of this Congress, a unique position. I am the sole and only surviving delegate from that state. When the cards were handed out the other day, for the purpose of organization, I immediately called a meeting of the delegates, consisting of myself, and in a labored session I reached the deliberate conclusion that the burdens of the various positions outlined on that card were too onerous for one man to assume, and in addition to that I was overwhelmed by my innate modesty, and I could not key myself up to the part of designating myself as Chairman of the delegation, member of the Committee on Organization, Committee on Resolutions, and so on, and Honorary Vice-President of the state. Hence, after due deliberation with myself, I concluded that I would designate myself a member from the state at large, and a general utility member. (Applause.) And under that designation, I presume, that I have a right to make a short response on behalf of Kentucky.

We have no marsh, or swamp lands in Kentucky; we have no arid lands there. Hence, from a local standpoint, Kentucky is neither interested in irrigation nor in reclamation, but I want simply to say this: I have attended every session of this Congress, and while the people of my state are not advised about these things, and what is now and has been going on, I want to say that I have been at all times very much entertained, and very much instructed by the proceedings

had in this Congress, and I shall go home feeling that I have been tenfold paid for the time that I have expended in attending this Congress, and the small amount of money involved in paying expenses. I simply wanted to make this short statement. I reckon that I may be considered in the sense in which I have indicated, a delegate, and I simply wanted to make this short statement as a slight evidence that Kentucky was still on the map. I thank you. (Applause.)

PRESIDENT FOWLER: The utilitarian delegate is not foreign to this Congress. We are always glad to welcome the utilitarian delegate, because the term means something, it means that they work. We hope this Congress is made up of this class of men. Otherwise we would not have achieved in the past as much as we have.

We will have one more speaker and then we will adjourn this meeting and take up the call of states to-morrow morning, and it will necessarily be somewhat long, and we will commence to-morrow morning's session promptly at half past nine. The session will be at the Auditorium Theatre. I will call upon Louisiana.

LOUISIANA

No response.

MAINE

MR. W. E. BELCHER, of Maine: Mr. President, Ladies and Gentlemen: As delegate from Maine, I wish to extend greetings to the Congress and to assure the delegates from other states that our interests are not diverse.

Our problem in Maine is largely one of drainage, as a considerable portion of the soil contains clay, or a clay sub-soil very near the surface. We need drainage for such land as this and also for our swamps, of which there are a great many scattered throughout the state.

The crop of which Maine is particularly proud is the potato, and during the year of 1910 the production per acre of 190 bushels was far ahead of that of any other state, Wisconsin being second with 116 bushels per acre. The apple orchards of the state are also being made to produce more abundantly than ever before, by methods that have been taught us by the West. In not a few cases, the old farms are being taken up again by returning sons of the state.

The experiment station at Orono is a very valuable aid to the agricultural interests of the state, carrying on extensive experiments, distributing literature, running demonstration trains, etc. The work of this station with regard to the development and care of hens is well-known. We are also great friends of the conservation movement, and realize that large areas that are now only stump fields, and practically valueless on account of the methods pursued by the paper and lumber interests, would still have been covered with valuable forests if the forestry conservation policies of to-day had been used in our state. (Applause.)

MARYLAND

No response.

MASSACHUSETTS

No response.

MICHIGAN

No response.

MINNESOTA

No response.

MISSISSIPPI

No response.

MISSOURI

PRESIDENT FOWLER: Ladies and Gentlemen of the Congress I take great pleasure in presenting to you, Mr. Knight, of Missouri.

MR. THOMAS KNIGHT, of Missouri: I feel some hesitancy in conveying to you the message from Missouri. The message from Missouri to this Congress is that if Missouri can help this Congress, as Missouri has done from the day on which the first Irrigation Congress was held, Missouri is ready and willing to do it. Whether it be to irrigate the perennial and abnormal drought of the state adjoining it on the west, or to absorb some of the fair moisture of Illinois and the city of Chicago, Missouri is ready to do that.

But Missouri wants it clearly understood that she has not been sleeping, and she wishes to remind the Congress that many of Missouri's men assisted in fighting for, and fighting to what we thought was the last ditch, on the appropriation, such men as Mr. Bowen and Senator Warner and Mr. Caraher and many others who helped in the fight.

Now, Missouri recognizes the fact that what is good for the common weal is good for Missouri, and she never fails to get her share of it.

There is one thing of interest to me professionally, and I think the Congress will sustain me in my view. As a professional man, as an engineer at one time, I remember the question could be and was asked of the engineer: "Can this be done?" But now the question that is put is: "What will it cost to do this?" And the reply is, "Are you in earnest? Do you want it done? Have you the money to do it?" And it is done. I need not specify to illustrate this, I need not allude to our drainage work, to our canals, our railroads, things that only a little while ago were considered impossible, dreams, but they have been done, and greater things than these will be done. If the ones now passing off of the stage can not in the short time allotted to them do these things, there are others to come that will, and if the delegates from Wyoming, Colorado and California will permit me to say, if their sons cannot, it is possible that their daughters will. (Applause.)

PRESIDENT FOWLER: It is now late and we are reminded of the understanding that we should vacate this hall very soon after five o'clock. I thank you for your attention this afternoon. We will now adjourn until to-morrow morning at the Auditorium Theatre, at 9:30 o'clock.

An adjournment was here taken by the Congress until 9:30 o'clock a. m., Friday, December 8, 1911, at the Auditorium Theatre.

EIGHTH SESSION
FRIDAY, DECEMBER 8, 1911
9:45 o'clock A. M.
AUDITORIUM THEATRE

The Congress was called to order by President Fowler at 9:45 o'clock a. m., in the Auditorium Theatre.

PRESIDENT FOWLER: We will continue the call of states, beginning with Montana.

MR. GEORGE H. MAXWELL, of California: Would a resolution be in order, Mr. President?

PRESIDENT FOWLER: By unanimous consent.

MR. MAXWELL: I desire to offer a resolution to be submitted to the Committee on Resolutions.

PRESIDENT FOWLER: Under the rules a resolution cannot be presented excepting by unanimous consent. If there is no objection on the part of the delegates to the resolution now handed in by Mr. Maxwell, it will now be read.

The Secretary then read the resolution referred to by Mr. Maxwell, endorsing and urging the co-operation of delegates to secure the passage by Congress of Senator Newlands' River Regulation Bill, entitled: "A bill to create a Board of River Regulation and to provide a fund for the regulation and control of the flow of navigable rivers in aid of interstate commerce, and as a means to that end to provide for flood prevention and protection and for the beneficial use of flood waters and for water storage, and for the protection of watersheds from denudation and erosion and from forest fires, and for the co-operation of government services and bureaus with each other and with states, municipalities, and other local agencies."

SECRETARY HOOKER: The Congress is in receipt this morning of several telegrams; three of them from Governors of states, Governor Mann of Virginia, Governor O'Neal of Alabama, Governor Gilchrist of Florida; one from the Southern Commercial Congress and the remainder from mayors, commercial clubs and organizations of southern and eastern states, endorsing Charleston, South Carolina, as the next place for the Irrigation Congress to meet. Unless there is a request for the reading of them, they will not be read, but will be incorporated in the Official Proceedings.

Richmond, Va., Dec. 7, 1911.

National Irrigation Congress, Chicago:

I trust it may be the pleasure of the National Irrigation Congress to hold its next meeting in Charleston, South Carolina, as the Chamber of Commerce of that city desires. The South is not much interested in irrigation except so far as it contributes to the good of our common country. But if the Congress would stand for reclamation and irrigation it would mean a great deal to the southern states.

WM. HODGES MANN, Governor.

Montgomery, Ala., Dec. 7, 1911.

National Irrigation Congress, Chicago:

I earnestly recommend and urge that the next session of the National Irrigation Congress be held in Charleston, South Carolina.

The South is vitally interested in the questions that will come before the Irrigation Congress and Charleston would give all delegates a royal welcome.

EMMETT O'NEAL Governor.

Tallahassee, Fla., Dec. 7, 1911.

National Irrigation Congress, Chicago:

Trust Charleston, South Carolina, will be next place of meeting.

ALBERT W. GILCHRIST, Governor of Florida.

Washington, D. C., Dec. 7, 1911.

National Irrigation Congress, Chicago:

In view of the immense unused agricultural resources latent in the wet lands of the nation, of which sixty million acres are in southern states, we respectfully urge that next session your Congress be held in southern territory. We commend the activities of Charleston to your favorable consideration.

SOUTHERN COMMERCIAL CONGRESS.

Charleston, S. C., Dec. 7, 1911.

National Irrigation Congress, Chicago:

You are cordially invited and earnestly urged to hold your next Congress in this city at same time as National Corn Congress is being held in Columbia, South Carolina.

R. G. RHETT, Mayor.

Charleston, South Carolina, Dec. 7, 1911.

Chairman National Irrigation Congress, Chicago:

By unanimous resolution the Charleston Ad. Club invites your Congress to hold its next convention at Charleston, S. C. Most convenient port to Panama, deepest seaport South Atlantic coast. Within twelve to thirty-six hours ride from any state east of the Mississippi. In 1912 the National Corn Show will be at Columbia, S. C., within three hours ride from Charleston. We have thousands of square miles of swamp land that we need help and suggestions to improve, therefore we heartily invite you to come and see Charleston first.

O. G. W. MARJENHOFF, President.

Mobile, Ala., Dec. 7, 1911.

Arthur Hooker,

Secretary National Irrigation Congress, Chicago:

Since a great deal that pertains to the work of your Congress is yet to be done in the millions of acres of wet land in the South we hereby urge that your Congress consider favorably the claims of Charleston, S. C., as the place for your next convention. Drainage is a matter of great importance in the development of the South, which comprises one-third of the area of the United States, and which has more undeveloped resources than all the rest of the country put together. Therefore your Congress would be able to come into closer touch with the great work needed by meeting in the South next time.

MOBILE PROGRESSIVE ASSOCIATION.

Spartanburg, S. C., Dec. 7, 1911.

Arthur Hooker,

Secretary National Irrigation Congress, Chicago:

Spartanburg joins hearty invitation your body to meet next in Charleston. We suggest that meeting in Charleston would interest many who are not now in touch with your objects and that the co-oper-

ation of a section that in next few years will be of tremendous influence will be secured. No section needs the convention more nor is there one which would more highly value it.

SPARTANBURG CHAMBER OF COMMERCE.

Columbia, S. C., Dec. 6, 1911.

Arthur Hooker,

Secretary National Irrigation Congress, Chicago:

The Columbia Chamber of Commerce sends greetings. Regrets not having a delegate in attendance. Most heartily endorses and prays for your favorable consideration of Charleston's invitation for 1912 during holding of National Corn Exposition in Columbia. Your Congress is after results which can be best gotten in South Carolina during this Exposition, where the best of those interested in your good work will be found during that time. Excursions will run from Columbia to Charleston during meeting of your Congress there, that this representative body attending National Corn Exposition may get in close touch with your Congress and its purposes.

A. McP. HAMBY,

Secretary-Treasurer Columbia Chamber Commerce.

Florence, S. C., Dec. 7, 1911.

Arthur Hooker,

Secretary National Irrigation Congress,

Chicago, Ill.:

Charleston, S. C., is asking for the meet of the National Reclamation Congress next year. The Chamber of Commerce of this city heartily endorses the effort and believes that such a meeting will be both beneficial to those from other parts of the country who will attend the meet and also of great value to the people of this state in awakening an interest in developing lands which have remained idle. We believe that this meet should come to this side of the continent for the mutual benefit of all concerned and hope that the plea of the metropolis of South Carolina and the most important seaport on the South Atlantic will meet with the approval of those who will designate the meeting place of the Reclamation Congress next year.

TOM M. MORGAN, Secretary.

Charleston, S. C., Dec. 7, 1911.

National Irrigation Congress,

Chicago, Ill.:

Your Congress is cordially invited to hold its next session at Charleston, S. C., where thousands of acres of swamp lands can be converted into highly producing farm lands. We will welcome your Congress here and put forth every effort to make your visit both a pleasant and instructive one.

RETAIL MERCHANTS' ASSOCIATION.

Charlotte, N. C., Dec. 7, 1911.

Arthur Hooker,

Secretary National Irrigation Congress, Chicago:

Greater Charlotte club six hundred members supplements invitation of sister city, Charleston, to hold next convention National Irrigation Congress in Charleston, S. C. Urging you to accept. No section of our country contains so vast an area needing reclamation as South Atlantic, making Charleston logical point for reclamation Congress.

W. T. CORWITH,

Secretary Greater Charlotte Club.

Montgomery, Ala., Dec. 7, 1911.

Arthur Hooker,

Secretary National Irrigation Congress, Chicago:

Business Men's League of Montgomery earnestly urges that the next convention be held in Charleston, S. C. The Southern States with their millions of acres of undrained lands feel an immense interest in your work and we believe the organization ought to meet next in this section.

BRUCE KENNEDY, General Secretary.

Rock Hill, S. C., Dec. 7, 1911.

Arthur Hooker,

Secretary National Irrigation Congress,
Chicago, Ill.:

Western arid lands having been made to blossom as the rose, it now appears that the wet lands of the Southeast should have some consideration of the National Congress. Charleston having asked for next session of your honorable body we support her cause with pleasure and anticipate acceptance of invitation.

W. H. CREIGHTON,
Secretary Chamber of Commerce.

Albemarle, N. C., Dec. 8, 1911.

Arthur Hooker,

Secretary National Irrigation Congress, Chicago:

Whole Southeast anxious that you hold next session of the National Irrigation Congress in Charleston, S. C. This section of the country deeply interested in your work and will lend every possible effort to make your next session splendid success should you see fit to bring Congress to Charleston, South Carolina.

PIEDMONT COMMERCIAL CLUB,
G. L. Feagin, Secretary.

Charleston, S. C., December 7, 1911.

National Irrigation Congress, Chicago Ill.:

The Merchants Exchange of Charleston, South Carolina, most earnestly urge you accept the invitation to hold your next meeting in Charleston. Our people are in full sympathy with and intensely interested in all phases of your work.

JOHN L. SHEPPARD, President.

Louisville, Ky., December 7, 1911.

Arthur Hooker, National Irrigation Congress, Chicago, Ill.:

The Louisville Commercial Club with a membership of 3000 business men urges that the next meeting of Congress be held at Charleston, S. C. Millions of acres of undrained land await development in this section. Whole South would benefit from your Congress going there.

A. B. LIPSCOMB,
Secretary, Louisville Commercial Club.

Atlanta, Ga., December 7, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago:

Atlanta Chamber of Commerce hopes drainage congress will go to Charleston next. That is in the center of a region which has immense area to drain. Hope you can help McKeand take the congress there.

W. G. COOPER, Secretary.

Winston-Salem, N. C., December 7, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago:

In behalf of the citizens of North Carolina and South Atlantic States we earnestly request your honorable body to hold next meeting at Charleston, South Carolina.

WINSTON-SALEM BOARD OF TRADE.

Jacksonville, Florida, December 8, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago:

This organization would be very glad to have you give favorable consideration to invitation of Charleston Chamber of Commerce to hold your next annual convention in that city. We feel sure that you will get a typical southern welcome there.

H. H. RICHARDSON.

Secretary, Jacksonville Board of Trade.

Wheeling, West Virginia, December 8, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago:

Wheeling would be glad to see Charleston, South Carolina, selected for the next meeting of your organization, and hopes that the invitation of the Charleston Chamber of Commerce will be favorably considered.

R. B. NAYLOR,

Secretary Board of Trade.

Savannah, Ga., December 7, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago, Ill.:

Charleston only bidder from Southeast next convention your Congress. South vitally interested in removal surplus water from overflow lands. Eminently fitting your next convention should be held in Southeast. Savannah Chamber of Commerce sincerely hopes that Charleston application will be acted upon favorably.

J. F. GRAY, Executive Officer.

Tampa, Florida, December 7, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago:

Board of Trade of Tampa trusts that South will be recognized in selection of next meeting place of Congress and we are heartily in favor of Charleston.

W. B. POWELL, Secretary.

Union, S. C., December 7, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago, Ill.:

Chamber of Commerce of this city urges National Drainage Congress to hold next meeting in Charleston, the great port and metropolis of South Carolina. Not only Charleston but every section of the state would welcome you.

J. G. HUGHES, Secretary.

Asheville, N. C., December 7, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago:

The Asheville Board of Trade comprising leading business interests of city and western North Carolina extend best wishes and earnestly urge your selection of Charleston by the sea for 1912 meeting

N. BUCKNER,

Secretary, Asheville Board of Trade.

Shreveport, La., December 8, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago:

The National Irrigation Congress is respectfully urged to hold next session at Charleston. The Southeast and South have millions of acres of undrained land and next meeting should be held where it is most needed.

GEORGE T. ATKINS,
Traffic Manager, Chamber of Commerce.

Greenville, S. C., December, 8, 1911.

Arthur Hooker, Secretary, National Irrigation Congress, Chicago, Ill.:

Greenville earnestly endorses Charleston's claims for Congress. Southeast's future unlimited. Large area in South Carolina would be greatly benefited by reclamation measures.

A. S. JOHNSTONE,
Secretary, Greenville Board of Trade.

Charleston, S. C., December 7, 1911.

The National Irrigation Congress, La Salle Hotel, Chicago, Ill.:

The agricultural society joins heartily in urging that the next Irrigation Congress be held in Charleston. With best wishes for the success of the Congress.

SAMUEL G. STONEY, President.

PRESIDENT FOWLER: We will now proceed with the call of the states, and I would suggest that those, who have been selected by delegations to respond to the call, come up to the platform and respond without any loss of time..

MONTANA

MR. S. B. ROBBINS, of Montana: Mr. Newman was selected to respond for Montana. He is not here now. He requested that Montana be passed.

NEBRASKA

MR. CHARLES E. SEIFERT, of Nebraska: Mr. President and Gentlemen of the Congress: Nebraska has none of the problems such as a great many have expressed in this Congress. We are the humid region, and our problems are small in comparison, so far as drainage or irrigation is concerned, but we need to conserve our moisture, and we also need to drain some of the grass land. We have about twelve drainage machines working in the state and a great many drainage districts are being opened up. Nebraska as a whole has followed in this respect the lines of least resistance, perhaps, as they have also followed similar lines in general farming, but the time has come, the education has brought it to the point where the people will recognize that the lines of least resistance are, perhaps, the lines of greatest endeavor. The paper by Mr. Milo B. Williams was especially interesting to me, as he touched on this phase of the question a little deeper than any other speaker. One thing that has appealed to me very much through this whole session of the Congress is the broad, liberal lines on which the Congress is working. It has appealed to me greatly, to recognize that there is no sectionalism, and, above all, that the members of the Congress are in no sense narrow in their views or ideas. We haven't traveled into any rut, so far as I can see. In this connection, the talk that we listened to by the Honorable Mr. Smythe, of California, sounded a note for humanity, the conservation of the people, that I believe goes out further than

any other one subject that has been touched upon, and I am especially glad that I have been able to attend this Congress and listen to such words of humanity and fellowship. In the First Chapter, 13th verse, of Haggai, we read the following:

"Then spake Haggai, the Lord's messenger, in the Lord's message unto the people, saying, 'I am with you, saith the Lord.'"

It also pleased me to see that the ladies, the women, are interested. That means that the whole people are interested. When we get the whole people interested our problem is a small one. I thank you. (Applause.)

PRESIDENT FOWLER: In making the call of states it is well to keep in mind that the object of calling the state is to hear directly from the state. Different states may have ideas to suggest, resulting from their own experience, that may be valuable to the Congress.

NEVADA

PRESIDENT FOWLER: Ladies and Gentlemen, Mr. James G. Givens, who will tell you of Nevada as an agricultural state.

MR. JAMES G. GIVENS, of Nevada: Nevada has been so long identified as a mineral state that her acres have not been considered as a land for farmers. In fact, the belief that Nevada is a mineral state only is so strong that to mention her agricultural possibilities seems to the mass as a travesty on farming. Yet, the agricultural resources of the State of Nevada deserve the attention of all men who till the soil and who look to the West for a home. In truth, so great are the agricultural possibilities of Nevada to-day, that the wealth that has been taken from her mines, is far from being the peer of the wealth she holds in her agricultural districts.

In the Southland, Nevada has substantially the same climate, the same soil, the same products and the same water conditions as has the State of California of which it once was a part. Nevada has the same warm summers and the same superb winters; like Southern California, she has the climate of central Spain and of Southern Italy, semi-tropic, healthful, a Mecca for the tourist.

Yet, there is difference: our vegetables and fruits mature the earliest and are the first on the market. At the exhibit made at the Land Show held in Los Angeles last March, our grasses were the longest, our alfalfa was the deepest, our exhibit contained the only asparagus, and our garden stuff in all respects held the advantage over California.

Why is this true? The reason is clear. Our valley is remote from the ocean and growth is not retarded by chill winds. Our valley is rimmed in by high mountains and our growths are protected from the frost that kills and the winds that sweep the plains on the other side. The acres of our valley are sheltered from the chill of ocean and the cold that grips the plain.

Nevada sends out a call for settlers. We want you to see this land, and visit our exhibit of products in this Land Show. Our valley is beautiful as a natural setting for homes. Our town is up-to-date in all particulars. Visit us and see the range of products now allotted to our valley and then understand the still greater range open for experiments for the future. You will see that our range of products is practically that of Southern California and like that country, we grow all the year round. We grow the same products that have made California the greatest market garden and fruit land in our whole country.

It is the "early bird that catches the worm" and that section of our country that will grow the first vegetables, the first fruits and the latest vegetables and the latest fruits, and put them on the tables of such hotels as the Waldorf-Astoria and of the Ocean Liners the earliest, and keep them there the latest, 'reaps the harvest of money

expended for luxury. The great profits possible for fruit and market men in Las Vegas valley lie in the fact that things mature there from two weeks to a month earlier than in any other part of the Southland and that they are grown there from two weeks to one month after they have ceased to grow elsewhere. We have the chance at the earliest and the latest market and can dictate our prices and get them.

Our lands are cheap at this time but the time is coming when they will be among the highest priced lands in this whole country. Why? Jim Hill says that it takes a large country to feed a large city. Los Angeles will be a city of 1,000,000 people in a few years and other cities will be larger. Here is one market for our produce. Eastern cities will add to the demand. The mining camps of our own state create a great demand for all garden and fruit products. The gardens of Las Vegas, with the whole Southland, produce those products which are the luxuries of the Northland, the Eastland, the Westland and the countries over the seas.

At this time the Salt Lake Road is the outlet and by this artery of transportation our produce may be sent in every direction and to all countries and cities as well as to the interiors of our own state.

Nevada has made three calls for citizens. She makes this call to-day. She asks people to come and live within her bounds. The first call was metallic, and rang out with the sound of silver bells. The notes were rung from the Comstock, and reached the uttermost parts of the earth and men rushed across land and sea lured by the music in that call. They stayed a while, stored great piles of silver, made the fortunes of a Croesus and went away retaining neither residence nor wealth to benefit the state that gave so freely. Of the millions yielded by these great mines, little benefited Nevada.

After many years, Nevada sent out another call for people to come and live within her bounds and make home and wealth out of the precious metal that she gave so freely. This call rang out, clear, mellow, sweet and golden, and the call centered at Tonapah and Goldfield. Again men rushed madly across the desert and surged back and forth for the gold that lay in the hills. Many millions of dollars were taken from the fastnesses where they had lain for centuries, and as the seekers either gained or lost of these millions, they went elsewhere, and of the wealth yielded by Nevada almost nothing was left that meant the up-building of the state in her institutions or development of resources.

Now from the sunny side of Nevada, where California's boundary joins lines with the Sage Brush State and makes them one in climate, soil and product, comes this last call to people to come and live within her bounds and make home and wealth out of the resources she gives so freely. This call is the call of water, the call that means permanence of population, the building of homes, the increase of wealth to individuals without decrease of wealth or exhaustion of resources. This call has the sound of many waters with Las Vegas as its center. It is the true call for the production of wealth in response to water, means permanence to the state and to institutions within her bounds.

The desire of every true American citizen is to own his home and have a competency to support it in comfort. This last call sent out from Nevada is to come to her lands and establish in Las Vegas valley a home and develop her acres by intensive farming to sustain the same.

The present call has neither the silver sweetness of the first call nor the golden melody of the second, but it contains both tones in its harmony. It is the call of water to come and populate a land as rich as was the "Land of Promise" in that desert of old, and the music of the water is accompanied by the rustle of leaves and the

song of the grass to swell the volume. It is a call to, "Come, take land, make this desert a place of homes, a land of vine and fig tree, of nesting birds, of blooming flowers, of running waters." It is a call to heed by those who are seeking a land where the climate gives health; the land gives wealth; where there is equal freedom from both drouth and flood; where the conflict with Nature is reduced to a minimum. (Applause.)

NEW JERSEY

PRESIDENT FOWLER: Gentlemen and Ladies of the convention, Mr. George A. Mitchell, of New Jersey.

MR. GEORGE A. MITCHELL, of New Jersey: Mr. President and Members of the Irrigation Congress: I wish to call your attention first to a paper read by Mr. Milo B. Williams yesterday, because it covers the case of New Jersey, and I do not need to repeat about irrigation in New Jersey.

In New Jersey we have a great deal of cheap land with good markets close by, large markets, Philadelphia and New York and the surrounding cities. There are a great many city people who come there and buy farms and do not know how to farm, and there are a lot of small farmers who could make a good thing by putting in an irrigation plant, but they do not know how.

That is the matter I want to call attention to, the lack of knowledge in regard to irrigation. Truckers and strawberry growers have succeeded with irrigation in times past, especially those truckers and strawberry growers who know fairly well how to grow a crop without it. But we have never known how to irrigate our general farm crops, and in that section we class potatoes and sweet potatoes with farm crops.

We have not known how to do irrigating until the last few years, and we have had some very valuable suggestions from men sent from the Department of Agriculture.

While we are talking of irrigated farm crops, I was very much surprised to hear from Dr. Fortier the advice we heard as to irrigating alfalfa. We had supposed it was a dry weather plant. The experience of the last summer has proven that his advice was good. We have got results from irrigating alfalfa in southern New Jersey which caused an institution managed by hard-headed business men to put up a plant on five acres that had cost something like \$600, as an experiment to see whether it would pay to irrigate their 50 acres or so of alfalfa.

Now, that may not mean much to you gentlemen who are in the habit of talking in millions, when we speak of spending \$600 in irrigating alfalfa, but if you were in New Jersey where irrigation of alfalfa is an unheard of thing, it would mean something that people are willing to do that.

But to come back to the main point and the only point I wish to impress here, and that is that this came as a result of expert advice which we have received from Dr. Fortier and Mr. Williams.

It is advice like this that is needed for farming that has been spoken of by other speakers. People go out on the farms and they waste a great deal of time in trying to find out how to farm. So if we go ahead and try to find out ourselves how to irrigate, we waste time and money, and we have wasted time and money; but, gentlemen, let us have someone who can put us right, let us carry it a little farther and show us how to find out how much it costs to get in these different crops, and how much we will get off of these crops, and we will do the rest.

One of the things we ought to know is how we can get water from wells, for we must get water from wells, and we are very much interested in this. I attended the drainage meeting last night and was very

much interested in drainage in New Jersey, although Mr. Watson must know more than I do when he speaks of the mosquito dying from malaria, because I have not seen any dead ones there. But we are interested in drainage, and if you want the opinion of just a plain farmer and not a statesman, I would like to say that what Mr. Pinchot and Mr. Garfield said about holding together impresses us there, because we have had trouble with our drainage organization, and there has been danger of splitting, but we have not split and we are not going to split, so I want to say that the thing which is necessary is to hold together and we would like the help of this organization in developing irrigation in New Jersey. (Applause.)

PRESIDENT FOWLER: That is the kind of talk; give us something about your state, something that is of value to your state as well as to the rest of us.

NEW MEXICO

PRESIDENT FOWLER: Ladies and Gentlemen, Mr. Willard E. Holt, of New Mexico.

MR. WILLARD E. HOLT, of New Mexico: Mr. Chairman and official delegates: We had all coached up an eloquent lawyer of Las Cruces, who expected to answer to this call of states. He was out to the theater last evening, and I suppose this morning is taking a quiet nap. New Mexico, however, could not possibly pass without saying "Hello" to the boys. We, you know, are your little baby sister and we are going to grow to be one of the great big family, and we are growing mighty fast. We have not a grouch of any kind, whatever. We do not want the government to break itself in assisting us. We are with every reclamation, every reformation, every irrigation, and any other project that benefits the whole country.

We have got four million acres of land that will produce the finest crops in the world as soon as the water is turned on, and we have got the water and we are turning it on, and we are producing the goods.

This afternoon it will be my pleasure to tell you what we are doing, not what we expect to do, not what theories have been advanced that we may do, but what we actually are doing; and I believe that is what the delegates want to know. What we are doing there is making our farmers independent. New Mexico, as the baby state in the Union, greets all the states. We are for you, for anything that benefits the whole country. We are glad to be represented at this Congress and I wear upon my more or less manly breast a little badge which says: "First Annual Irrigation Convention." That was held at my home city at Deming, as this badge indicates, on November 7, 1893. That was along the line of the Salt Lake convention held a year or two previous, and it was the very inception of the Congress that now commands the attention of the entire world.

We are proud to greet you this morning, because we are going to be one of the great, wealthy, magnificent states of the Union. We shall work with you and for you, and all work together for the benefit of the whole country. We are a united state now in the United States, and we hope to do everything that is possible to make this country and maintain it and keep it the greatest, grandest country on the face of the green earth. (Applause.) Patriotic, isn't it?

You know, as I have been in attendance upon the sessions of this Congress, I could not help but think of the wonderful work of the officers, and particularly of the Secretary's work—he is not present, so I can compliment him. They have done a marvelous work. Now I suppose I have received fifteen letters in the last six months from Mr. Hooker, urging New Mexico people to be present. And we are here, and we are mighty glad to be here.

You know the people of the East have a wrong conception of us in

the Southwest. The cartoonists have pictured us as the bad man with the chaps and guns. That is not true. Does my brother here who sits at my left (President Fowler) look like a bandit? Does Judge Hutton have the appearance of a desperado? O, no; that feature is all gone. We are the best people in the world, if you only knew it. That is what we are here for. We would like to have the people of the East know that we are decent and we would like to have them make up with us. (Applause.)

NEW YORK

PRESIDENT FOWLER: Gentlemen and Ladies and Delegates, permit me to introduce to you Mr. E. W. Catchpole, of North Rose, N. Y.

MR. E. W. CATCHPOLE, of New York: During the past five years there has been a marked advance in general agriculture in the State of New York. First and foremost, the Department of Agriculture with its famous institution; second, the College of Agriculture at Cornell University, and, third, both state and federal experiment stations.

The result of this work has been a general shift in farming of all kinds, and the material advance in farm values, not only in districts purely agricultural, but especially in the Hudson River Valley, the Lake Champlain region, and Findley Lake in the central part of the state, and last but not least, the five great counties on the south shore of Lake Ontario.

I think the claim made by Michigan could also be made by the State of New York, that a larger per cent of profit on the investment is made by fruit growers in these states than in any other states east of the Mississippi.

As regards matters economic, we have had a bit of experience along these lines. Some of them have been very expensive. We hope, however, some of these may come to something later on. We have the great big project from Buffalo to New York, the barge canal. We have been doing a great deal of work by way of drainage, largely by private enterprise, the reclamation of large swamp tracts which makes valuable those districts for special crops, and they are bringing a very large return at the present time.

It is a pleasure to me to see the work that has been done down in eastern North Carolina. As I remember, this is entirely a private enterprise. The Illinois delegation pronounced that soil equal if not better than the best black soil of the State of Illinois. What does that mean to bring in 30,000 acres of land within the transportation area of New York City, valuable for special crops at this time? It simply means cheap food production.

Although this is the first time I have been a delegate to this Congress, I am very much interested in the work of the Congress, not only in what has been done but in the possibilities of the future. New York stands for this along general lines. I see no objection from New York to the Newlands bill. I think some of the other bills are worthy of the support of the good old State of New York. I hope matters can be arranged so that we all work harmoniously together for the benefit of the nation at large.

I want to offer just a suggestion here, Mr. President. There has been a little feeling of tension in the air, and I would suggest the point be considered in making up the next program of having one session given over to discussion and to getting acquainted and rubbing shoulders here, so that we can proceed along lines more understandingly, and so that the new members can get the information as to what has been done and what is to be done in the near future. (Applause.)

PRESIDENT FOWLER: The suggestion is a valuable one and will be referred to the incoming administration.

NORTH CAROLINA

No response.

NORTH DAKOTA

No response.

OHIO

MR. WALTER H. COLES, of Ohio: I am an eleventh hour speaker, like some of the others. I really want to pose more as a hearer than as an orator, except that I want to commend one line of conduct throughout the East, and I simply confine these remarks entirely to a greeting from our state. No man in the East familiar at all with irrigation can pass by an opportunity like this and not be derelict in his duty unless he expresses his approval and co-operation, and asks for support throughout the country as a whole, and especially throughout the East, of the office of Irrigation Investigations that is being conducted so ably for the benefit of the humid regions under Dr. Fortier and Mr. Williams. It is a sense of duty and the privilege of commending that department, and expressing the appreciation which Ohio holds towards that problem, that brings me before you to-day. The problems throughout the country, as I see them, on irrigation, vary distinctly and are well defined in the different localities. I come to this Irrigation Convention through a rather peculiar route. My first experience with Irrigation was in the East, and from the East, I went westward and became acquainted with those large projects. The impressions made on me, therefore, are possibly somewhat different from those made on you who come from the West eastward.

As I came into this Convention and the gavel was presented to our honored President, I noted the inscription placed upon that, bidding the desert drink. Everyone who is connected with irrigation gets tired hearing the statement made that an irrigator is a public benefactor in making two blades of grass grow where one grew before. But in connection with that it seems to me your problem in the West is somewhat different, making one blade of grass grow where none grew before. And I mention that simply because I want to contrast that with the problem that we have in the East.

Yesterday morning I heard Mr. Maxwell's eloquent address on drinks going to waste at Pittsburgh, and he has an entirely different problem on his hands. The conservation of the water that has been provided by nature, but which comes in such abundance that it cannot be realized. Our problem is entirely different. If we were to put it in language which some might understand, we would say that our question is simply the question that it is a long time between drinks. We have plenty of water, we have plenty of refreshment for our soil, but it is not quite properly distributed. We are able to raise our one blade of grass without confronting the irrigation problem, and it seems to me that the humid sections, especially of the East, are confronted especially with that problem of raising the second blade of grass, and it seems to me that I can bring a message from the East, from Ohio, and the other humid sections of this portion of the country that is contrasted with the problem which you have. Our problem is a somewhat different one, and whereas in general terms—of course you realize that in a five-minutes talk I can only speak in general terms—your irrigation projects make the deserts bloom, yet ours is a little different problem and we are working on that second blade of grass.

When you have heard such men as Mr. Wood, of Alabama, and Mr. Roebuck of Ft. Wayne, men who have worked on the irrigation problem in the East for years, you will see that they are endeavoring to produce the maximum crop on each square foot of soil. They can

raise crops without irrigation, and they are working on the second blade of grass. Naturally we are not handicapped by the immense problems of bringing the water to the land and our efforts are concentrated on this one field, and it is inevitable that in working this out, with the co-operation, the supervision, and the help of the Department of Agriculture, that we will work in different lines and accomplish results which bear, as a whole, on the irrigation problems of this country; and it is that idea that I want to bring to you from Ohio and from the East.

We are solving these problems that may be of some benefit to you. We are working in different lines, but after you have brought your water to the land, after you have utilized your surplus water, then the information which we have gathered as to the utility of the water may be of service to you, and it is at your disposal. (Applause.)

OKLAHOMA

MR. J. P. HARDIN, of Oklahoma: Mr. President, Ladies and Gentlemen of the Congress: About twenty-two years ago, upon that portion of the soil which is now known as the State of Oklahoma, there was a great Congress held, made up from self-appointed delegates from practically all of the states of the United States. At that Congress they passed resolutions to conserve their resources and to reclaim the wild domain, a portion of which is known as "No Man's Land." Since that time, through arrangements with Uncle Sam, and peace with the Indians, in twenty-two years we have placed upon those grounds some miniature Chicagos, St. Louises and Kansas Cities, and we have duplicated the old homesteads, the farms of Iowa, Illinois, Indiana and Ohio.

Oklahoma bears a very peculiar relation to the rest of the United States. Most all of us have relatives in Oklahoma. We have in Oklahoma the cities, the farms, the oil, gas, coal, railroads, great packing industries, and a prosperous and happy people. Along with that we have, as you have in Illinois, and through the East, the Trust also.

Oklahoma is interested in irrigation and drainage work. In the last three years, there have been about seven or eight thousand acres placed under the system, the modes used have been surface and sub-work. The water supply has been pumping stations, from the underground flow of the rivers, of which there is an abundance.

Oklahoma, up to June 30th, had appropriated from the sale of lands five and one-quarter million dollars to the reclamation fund, and up to that time the government of the United States had expended something like \$69,000 in the investigation of the work of irrigation and drainage in the state of Oklahoma. There are no government projects in the state at the present time. Individuals, corporations and firms are busy intending to irrigate and drain those portions now in the great state of Oklahoma.

As a delegate from Oklahoma, I want it understood that with the peculiar relations we bear to the older states, we are in favor of a national movement for the bettering of conditions of the farm homes of this country. There must be system to everything, and the work of this Congress, as laid out, should be heartily supported by every delegation, and when you go home you should use your influence to further the work of this Congress in this country. There is a peculiar situation that must be solved. This Congress can only do that which might be done in a national way, and through it come to the state and let the states take up their work, and from the states down to the communities, for we realize that the present condition of this country demands immediate action to get results from the soil. (Applause.)

OREGON

The response for Oregon was given Thursday afternoon.

PENNSYLVANIA

The response for Pennsylvania was given Thursday afternoon.

PHILIPPINES

No response.

PORTO RICO

No response.

RHODE ISLAND

No response.

SOUTH CAROLINA

MR. T. J. HAMLIN, of South Carolina: Mr. Chairman, Ladies and Gentlemen: I find myself in something of a predicament. If you will look along the southeastern coast you will locate South Carolina. We brought a man here who was to speak for South Carolina, but he was lost in the shuffle somewhere. When there is anything to be done, you all know you generally hear from South Carolina. I think I can substantiate that by referring to our record in connection with this Congress. We have had on the floor of this Congress as many as twenty-six delegates. We have drainage at home. We have an organization, and if you want to help us you will have to move on with it. We have a man in the person of our executive head who is doing a great work for our state. If you cannot come in in time to help us, we can go ahead anyhow. We are going on with our drainage, and we expect to keep right at it until it is done.

We have seen in this part of the country the result of irrigation and we are heartily in sympathy with the movement. I want to say that you can count on us to co-operate with you whenever it is possible. We have a lot of drainage and we are putting it into effect. Probably in this part of the country you have heard about South Carolina projects. There is no man in the East who has not heard of our asparagus. We don't want to ship it west because we don't want to take California's market from her. We supply the eastern markets. I am sorry our Chairman is not here to speak to you, but I thank you for this opportunity of letting you know that South Carolina is present. (Applause.)

PRESIDENT FOWLER: I know the Chairman of the South Carolina delegation, and I have no doubt but that he is doing good work, locked up somewhere in a room working with the committee.

SOUTH DAKOTA

MAJOR ROBERT MANN WOODS of South Dakota: Mr. President and Delegates: South Dakota is one of the youngest states and is one of the best. Best in her people, best in her laws, best in her finances, best in her schools and highest in educational tests. Less than 2 per cent of her people are illiterate. She ranks highest of any state in the union in her wealth per capita.

We have \$10,000,000 in our school fund and we have two and one-half million acres of school lands which we are selling at an average of \$50 per acre, which will make our school fund \$133,000,000. We challenge comparison with any other state. We will not only give every child in Dakota a common and a high school education, but we will give every one of them a university education free of charge.

Our hundred miles square of the Black Hills, where I live, is the richest hundred miles square in the world, in gold, silver, copper antimony, mica, tin and gypsum.

This five thousand feet uplift is the most picturesque and magnificent scenery imaginable; its beauty and grandeur have never been surpassed.

"Here Harney heaves up his vast form to the sky
And the Needles thro' azure quilts heavenward ply,
There the Sylvan Lake's foam o'er the mountain cloud spills
And Spearfish's deep canyon with wild beauty thrills.

There the caves open up their vast caverns of gloom
And the stalactites hang over each satyr's tomb
And the boiling hot flood springs in many a place,
And the quartz clasps the virgin gold in tight embrace.

Geology finds every fruit of its hands,
Rare rubies shine forth from her ore laden sands,
And rich gulches yield precious metals galore
When we only just touch wealthy nature's great store."

I say to you that Paradise itself is only half a mile away—in this direction—(pointing upward) and every man in Dakota can get there if he will only walk straight.

In spite of the great tracts which the general government has thrown open to settlement in our Indian reservations, South Dakota still has millions of acres subject to homestead, and what we want, what we must have to make every quarter-section of this land support a family, is the co-operation of this National Irrigation Congress to make such amendment to the Carey Act that we can have a reasonable time to pay for irrigation work and irrigation ditches.

We have twenty-five or more splendid locations now waiting this Act and for the capital to complete the work, locations that will irrigate from 25,000 to 250,000 acres each. The government is building one at Belle Fourche which will be splendid, but we want them at many other places. Like the one over at Rapid City, where the farmers have planned one for their own use. Here the limpid waters of Rapid Creek come tumbling down the gulch—like the waters come down at Lodore—clear, pure, the sweetest water I ever drank, enough and to spare, and it will not only irrigate every acre in that scheme, but furnish light and power and heat and pay a dividend of ten per cent and maybe twice that in perpetuity. But what those farmers want is the capital to complete the work, and the security they offer is the farms in one of the most fruitful valleys the sun ever shone upon.

What we want is the water—we have the soil, the sunshine and the grace of God. (Applause.)

PRESIDENT FOWLER: Now, do not get excited and take the first train for South Dakota.

TENNESSEE

No response.

TEXAS

PRESIDENT FOWLER: Mr. Matt Russell, of Texas.

MR. MATT RUSSELL, of Texas: Mr. President and Delegates: The Texas delegation appointed Mr. Cory for this address, and he left yesterday evening and requested that I fill his place. I am proud that I can do so. To tell you what we have in the few brief moments which are allotted to me is not enough, when five minutes is allotted to Rhode Island and Delaware and New Jersey, to tell you what we have in the broad State of Texas.

Commencing at our El Paso on the west and going down the Rio

Grande for 800 miles we have an arid country to be irrigated, and which is irrigated in part. We have made the greatest development there, I sincerely believe, of any state in the Union, along irrigation lines.

This belt that I speak of, known as southwest Texas, is one of the richest and most productive parts of the United States, embracing a territory as large as the State of Tennessee, producing the richest of fruits; that is, grapes, figs, oranges and other semi-tropical fruit, unsurpassed in the United States.

Commencing at Brownsville, we have a coast country of 700 miles up to Oran, that needs drainage, and a great deal of it. From Houston and Galveston north, up through the timber belt of 150 miles wide and 300 miles long, we have the pines, the cypress, the hardwoods that perhaps can not be equaled anywhere. The mills of Wisconsin and Michigan come down there and cut up that vast belt of timber.

Reaching from Texarkana for 100 miles south and west along up the Red River we have the fruit belt of Texas, and the corn belt of Texas. Along the Red River are reaches of vast bottomlands that produce corn not excelled by any state in the Union.

Going along up the river until you strike what is known as the Panhandle—and when I was a boy it was put down on the map as the "Great Staked Plains" of the West, uninhabited, but to-day there you find prosperous and industrious farmers.

Through the central part of the state is the vast corn, wheat and cotton region. To-day Texas is sending into the world more than one-third of the entire cotton crop produced in the United States.

We invite you to come down and see it. To the man who has eleven children or more: you can find a home in Texas, and a climate that will suit you as well as any part of the world, a country swept by the breeze of the Gulf of Mexico, and that breeze dispels consumption, bronchitis, and other pulmonary troubles. (Applause.)

UTAH

PRESIDENT FOWLER: Mr. Caleb Tanner, of Provo, Utah.

MR. CALEB TANNER, of Utah: Mr. President and Fellow Delegates: At the request of the delegates from Utah, I desire to present for incorporation into the proceedings of the Congress some sentiments of respect to the late John Henry Smith, by Dr. Seymour B. Young.

Utah, so far as the representation of states is concerned, seems to be bounded on the west by the microscopic farms of California and, on the south by the famous date tree of Arizona, and on the east by the king, queen and ten-spot of Colorado. Now, if that date tree had been a fig tree, we would probably be as near Eden as South Dakota is near Paradise. There is as much objection—no, I will modify that—there is objection, probably not as much, for settlers to leave the boundaries of a state, from the point of view of that state, and go over into another, as for the settlers to leave the United States and go into foreign countries north or south.

Now, great objection has been raised to our inability to keep citizens of the United States within the United States; and the same reason appeals to the state to keep her citizens within her borders.

Now, in the arid states now irrigated, how much have these states done to develop and assist the development of irrigation within their borders, the states themselves?

I may be wrong; if I am, I can readily enough be corrected, but outside of the states of Utah and Colorado, not one of the irrigated states have provided any means for the state itself, from state funds, to finance or invest in any irrigation proposition. The appeal is con-

stantly to the United States government. It does seem to me that the states themselves should do something along this line.

The government has granted in many cases, in most cases, probably in all cases, great tracts of land to the state. These have been sold or are in the course of being sold, and the moneys that have accrued from that sale are now in the possession of the state officers, being loaned on a variety of safe securities.

In the states of Colorado and Utah there is provided, and in these states alone, that these moneys may be loaned on irrigation securities. In the State of Utah over 90 per cent of irrigation development in the last ten years has been through the efforts of the United States government through the Reclamation Bureau and the Indian Bureau, and has been materially assisted by state funds in the reclamation of arid lands. While Colorado has our statute on its books, Colorado has done nothing along this line. It seems to me that one of the things the arid states should do is assist the development of those states by the funds of those states, for he who will not assist his own is worse than a heathen. (Applause.)

SENTIMENTS OF RESPECT TO THE LATE JOHN HENRY SMITH

By Dr. Seymour B. Young

John Henry Smith, the Christian Gentleman. Born on the banks of the Missouri River. He was of true pioneer descent. His was an honorable parentage. His father's genius and his mother's beauty blended in sweet harmony to bless his childhood.

Of hardy New England stock, he combined through his parentage his sodility of temperament, and stood forth the true American, the typical man of the West, of whom his countrymen may be justly proud.

He inherited his splendid physique, his capacious intellect, his loyal, loving, generous heart.

In the Christian home of his parents, his young life was developed, his young heart was taught that Divine Religion, from which he never wavered. And in that homestead, the Bible was held as a sacred book, from which his parents imbibed their true Christian principles, and instilled the same into his noble nature.

We must look with keen insight and deeper research for his immense power over his fellow men. His was a changeless sincerity. He was never in masquerade. He had a window in his soul. He was never in disguise. He was as you saw him.

"Never did geometrician bring proposition and demonstration in closer proximity than was the correspondence between John Henry's character and his appearance."

He was JOHN HENRY SMITH every time. His was the soul of honor. He had an innate contempt for everything low, mean or intriguing. He was an open and honorable friend. He had a triple courage which imparted to him immense strength. His physical bravery knew no fear. His moral heroism was sublime. But above these, was the courage of his true Christian manhood. He never committed treason against his own convictions. He thought for himself and spoke what he thought. He was always loyal to his conclusions. Friendship could not deter him, enemies could not make him afraid.

He had caution, but it was the sublime caution of intellectual greatness. He was the soul of honesty. He was rich in a good name, which he bequeathed to his family instead of riches, which is far above rubies. And like Aristides, he could say, "These hands are clean."

Loyalty to duty was his standard of manhood. In his affection he was as gentle as a woman. He could adapt himself to the sports and play of a child, and his hope and faith were enduring and sublime.

"No more for him the blazing hearth shall burn,
 Nor busy housewife ply her evening care,
 Nor children lisp a sire's return,
 Nor climb his knee, the envied kiss to share."

A deeply religious vein ran through his nature, and he received in a good and honest heart the words of the Divine One of Nazareth, the sweet assurance, "Let not your heart be troubled. Ye believe in God, believe also in Me. In my Father's house are many mansions. I go to prepare a place for you."

His burial service was held in the large Tabernacle in Salt Lake City, on the 17th day of October, 1911, the building being filled to its utmost capacity. There were a number of speakers, among the most prominent men of the state.

His casket was literally banked with the most beautiful flowers. Beautiful music was rendered by the Tabernacle Choir, also by a double quartette and soloists, accompanied by music from the great Tabernacle organ.

His remains were followed to the cemetery by an immense concourse of carriages and street cars filled with people who came to show their high regard of one who had been an undeviating friend to the rich and the poor, the high and the low.

Great throngs of people lined the sidewalk on both sides of the street as the procession moved on its way to the cemetery.

He was laid to rest in the burial place of his fathers, and thus all that remained to us of the noble citizen, the high-minded Christian statesman, the loving, affectionate, devoted husband and father, was assigned to Mother Earth in the midst of loved ones who had gone before.

Mr. President: The looms of time are never idle, and the busy fingers of the weavers are ever weaving as in a tapestry the many threads and colors that make up our several lives. And when these shall be viewed, whether by critics or admirers, there shall be found none of brighter colors or of nobler pattern than the life fabric of John Henry Smith.

"There is no death, what seems so is transition,
 This life of mortal breath
 Is but a suburb of the life elysian,
 Whose portal we call death."

Mr. President and Gentlemen: John Henry Smith has been connected as an official of the National Irrigation Congress from its commencement, and at the 17th session held last year at Pueblo, Colorado, he was again elected as an honorary Vice President. And I am sure I do not speak other than the truth, when I say that every officer and every member of this present Congress assembled here to-day will feel that they have lost a true friend, not only personally, but he was a friend to Irrigation, to Progress, to Advancement, and to the Uplift of his Fellowmen. And I believe you will all join with me in this sublime quotation:

"His form we shall see no more, but his work and his character are ours always; the body is dead, but the spirit hath Eternal Life and lives forever."

"For there is no death, the stars go down
 To shine on a fairer shore,
 And bright in Heaven's jeweled crown
 They shine forevermore."

It may well be said of John Henry Smith, he was a friend to the friendless, and for those who sought his counsel, his friendship or his aid his hand was open, and, prompted by the heart full of generosity, he ministered to everyone.

"He was true to his people,
True to his religion,
True to his country,
And true to his God."

DR. W J MCGEE, of Washington, D. C.: Mr. President: The call of states reaching Utah reminds me of the course of fraternal duty devolving upon the National Irrigation Congress.

I beg your permission to read a resolution, not designed to go before the Resolutions Committee, but designed for action, if it please the Congress, as soon as may be after the reading.

Dr. McGee then read the following resolution:

WHEREAS, Within a few weeks John Henry Smith of Utah has passed from among us, be it

RESOLVED: That this Nineteenth National Irrigation Congress record in sorrow its high appreciation of the work and character of the late John Henry Smith, a pioneer irrigator and delegate to the first Irrigation Congress, held in Salt Lake City, and an enthusiastic and effective supporter of the organization ever since, for years a first Vice-President of the body, and presiding officer at the session held in Chicago in 1900, and a man of large and beneficent influence in his own community, state and country. He left the world better for his work and example, yet the poorer by the loss we deplore.

DR. MCGEE: Mr. President, I move you, sir, that this resolution be adopted and spread on the records of this Congress and that a copy be sent to the relatives of John Henry Smith.

JUDGE FAIRWEATHER, of California: Mr. President, I take great pleasure in seconding the motion of Dr. McGee.

PRESIDENT FOWLER: You have listened to the resolution. The motion has been seconded. We all recognize that a great big-hearted man has gone. Are there any remarks on this motion? If not, those favoring the same will say aye.

The motion was unanimously carried.

PRESIDENT FOWLER: The Secretary is authorized to inscribe the resolution on the records and see that a copy is sent to the family of Mr. Smith.

Within a few moments I have received a letter which I will read. It is from Lewis W. Leach, of Denver. It reads as follows:

"I regret exceedingly that I am prevented from attending the sessions of the Chicago Congress this week.

"As a Denver delegate permit me to wish you its greatest success and that you will see that there is record made of the deaths of John Henry Smith of Utah and of Harper S. Cunningham of Oklahoma, during the past year, two men whose hearts and souls were in the great work of irrigation, and who merit a word of praise from each and every one."

This is the first notification the Chair has had of the death of Mr. Cunningham, who last year, you will remember, attended the session at Pueblo. And I would suggest that a proper resolution be drawn and presented to the Congress, adopted and recorded in the minutes of the Congress.

I know there will no objection on the part of anyone who knew Judge Cunningham and, assuming that it is the wish of the Congress, I would ask Dr. McGee to prepare a resolution in memory of Judge Cunningham.

VERMONT

PRESIDENT FOWLER: Ladies and Gentlemen, Mr. John M. Mead, of Vermont.

MR. JOHN M. MEAD, of Vermont: Mr. President, Fellow Delegates, Ladies and Gentlemen of this Congress: I want you to know that Vermont realizes the great influence of this Congress, that reaches from the Atlantic to the Pacific slope, vibrating an influence that reaches around the world.

First, I want to thank my fellow delegates for the honor bestowed upon me. For I feel that it is the crowning moment of my life to speak for Vermont before the representative men here assembled in this great Congress.

Vermont is alive to all the great interests of the whole country, and this is proven by the goodly number of delegates that represent Vermont here to-day.

Vermont's climatic conditions are such that in most sections we do not need irrigation, but we have thousands and thousands of acres that need to be reclaimed by drainage. Most of the soils of Vermont are such that no crops are ever failures, owing to rainfall, and heavy dews almost equal to rains.

Our best crop is the men and women we raise, who carry with them the principles and characteristic energy and intelligence that have made their very presence for all good advancement and development of all great interests in every state from the Atlantic to the Pacific.

Vermont has great resources, the largest production of marble of any state; the largest marble mills in the world, sending out a finished product extensively used for building and many other purposes. At the head of the Vermont Marble Company, one of the largest marble companies, stood the late Senator Redfield Proctor, undoubtedly known to many assembled here to-day as one of the strong men in our United States Senate when alive, and in recent months we have been obliged to mourn the loss of ex-Governor Fletcher D. Proctor, son of Senator Redfield Proctor.

Vermont has very extensive slate quarries, granite quarries, soapstone quarries, iron ore, gold, and silver, and lead and many other minerals are now being discovered in our state in greater or less quantities; we also have extensive ochre beds for painting purposes.

The preservation of our forests receives important consideration. Only about one-third of our state is cleared land. Our mountains are covered with a dense, heavy growth of nearly all kinds of timber which, when cut off, is quickly replaced by another growth.

Still our state is propagating some useful varieties of trees that are being transplanted and making rapid growth.

Vermont has the Burlington Agricultural College, and the education given to our young men is of great advantage to our agricultural interests, farming interests, intensive farming bringing into use the best methods, and modern farm machinery is fast bringing up the high production per acre accorded Vermont crops by the United States crop reports. Many acres yield from 4 to 7 tons of hay and alfalfa per acre, 40 tons of ensilage corn per acre.

Vermont carries more cows according to her population than any other of the United States. The great interests of dairying, fruit growing, bee culture, maple-sugar making, beef, pork, milk and butter production, and every other conceivable product of the farm, make farming in Vermont interesting because it is profitable.

The great water power of Vermont is being developed and artificial lakes are being converted into electric power, and utilized to run all kinds of manufacturing plants. The farmer uses electrical power in cutting his ensilage, sawing his wood, running separators,

lighting his home and the new modern sanitary stables with electricity. With all these great aids, including the telephone and rural delivery, we are not distressed by our sons going West but in the last decade thousands and thousands have come back to old Vermont and settled in their old homes, satisfied to engage in agricultural pursuits the remainder of their lives. In some instances they have returned sadder and wiser but generally gladder and wiser.

Vermont is pre-eminently a stock-growing state. The grasses of our splendid pasture and meadow lands under scientific chemical analysis show the highest percentage of nutrition of any of the states, I am told, and the springs and streams of pure water coursing down our mountain sides make Vermont farming one great delight.

All these conditions have helped to develop the world-famous Morgan horses of Vermont, the finest road horse, saddle horse, medium-size work horse, and army saddle horse ever known. The United States has established a stud farm in Vermont for the specific purpose of trying to perpetuate the breed of Morgan horses.

Vermont has long been the home of breeders of the highest type of the merino sheep, and these with Vermont's Morgan horse, Holstein, Ayreshire, Jersey and Guernsey cattle. These are often sold to go to Australia, Africa, the Argentine Republic, Germany, Japan and other sections of the world.

Do not forget Vermont is on the map. Although a small state, she is a power for good. And do not forget that the people of Vermont glory with you in the greatest, grandest achievements for the development of America's agricultural interests. (Applause.)

VIRGINIA

No response.

WASHINGTON

DR. C. H. BURBANK, of Washington: Mr. President, Ladies and Gentlemen: I have been interested this morning in these talks about the various states and in listening to the complimentary words used by our friend from South Dakota. I want to say to you that Paradise is in the geographical center of the state of Washington. The home of the big red apple, where dollars grow on trees—

A DELEGATE: Red apples, big red apples. (Applause.)

MR. BURBANK: Big red apples. I was interested in a line from our President's opening address: "But the brightest jewel in the crown of the Goddess of Production is the irrigated orange of Arizona and California."

We of Washington have thought that the big red apple is the proudest jewel in the crown of that great fruit garden. On the farms in our southern country as far south as San Diego and as far northwest as Blaine the big red apple, or the big apple, in all of its varied colors, is grown all over our big state. And we grow alfalfa in all its perfection. We have immense wheat fields that are feeding the hungry to-day. We have vast forests, we have vast power sites, marble quarries, gold fields, silver mines, copper and other minerals in great quantities. We are proud of the State of Washington.

We come to you to-day to tell you that we have immense opportunities to give, and to help you, if you will make your homes with us. Why, to-day we have in projection for irrigation nearly one-half a million acres of land under private enterprise. We are building storage reservoirs to hold back the waters, so that in the summer-time when we want them, we can turn them on to our fertile lands. We bid you welcome to Washington; come and see us. We will do you good. (Applause.)

PRESIDENT FOWLER: Well, I got it, and I expected it, but I thought I would throw a little compliment that might work off the keen edge of it somewhat and I want to read one line from the close of my address. You will see that I give prior notice to the apple.

"And the perfect apple and luscious orange of the irrigated orchard, admirable as they are in themselves, may fitly be regarded as nothing more than samples of the more elevated standards of human life, traceable, after all, to the real gift of irrigation to humanity."

But, please note, I put the apple first. (Laughter and applause.)

WEST VIRGINIA

MR. O. D. HILL, of West Virginia: Mr. Chairman, Ladies and Gentlemen: I came from the Little Mountain State of West Virginia, where the land is piled up in heaps, where we need neither irrigation nor drainage. The good Lord did that for us long before we came on the scene. I came here to your organization more as a representative of the Farmers National Congress, which believes that the great common people of this country ought to sit at the first table and are worthy to be honestly represented and treated fairly by the different departments of the government, than I did as the representative of irrigation or drainage interests of my state.

Although this line of improvement is not needed in our state there are a great many places where it is needed, and there are a great many things we do need and that you people and your organization can help us to do. That is why I am here.

We need better roads, better schools, lower taxes, and a postal system which is more in keeping with the needs of a progressive people, the conservation of our natural resources, less of the undesirable immigrants—in short we believe in America for the American people, and in fact a great many reforms which the Farmers National Congress and the progressive people of this country stand for.

In West Virginia, for a number of years, we have been electing people to represent us in the National Congress at Washington, who have been recreant to their duties as statesmen; and I expect you have had some of that kind of experience over here. We are trying to cut that out in the Farmers National Congress, and the way we expect to do it is this: We must try to send the best men to congress irrespective of party, if we can get them there, and we now send a committee from the Farmers National Congress after they are elected to the national government to make them give an account of their stewardship there, and that is what you people want to do (Applause). We have gotten tired in West Virginia of paying men salaries to do work for the corporations, when they had been employed as servants of all the people. We are going to have them quit it, and we want you to help us (Applause). You in the National Irrigation Congress need our help, and the Farmers National Congress need your help. We want to see the West, that needs water, have water; we want to see land southeast, where the land needs drainage, have drainage; we want Uncle Sam to do these things, and we are going to make him do them (Applause).

We don't want to send men to Washington to wear silk hats, sit at the pie counter and do nothing but vote for the system and corporate interests. We are going to send able, progressive men there to represent the great common people, and we are going to make them do something for us (Applause).

WISCONSIN

MR. WILLIAM LINDSAY, of Wisconsin: We have quite a delegation from Wisconsin, and I supposed that some one had been ap-

pointed to represent them, but it seems there is no one here to-day. I do not want Wisconsin to go by default, yet I am entirely unprepared, and not much at making an address.

I suppose most of you know that Wisconsin has perhaps the greatest variety of resources of any state in the Union. We have our mines of different kinds—lead, copper, zinc, iron and so forth. And we have our forests of pine, and we have our rich prairies and timberland. My father was a pioneer in the state of Wisconsin. He settled in the middle of it in 1843; in fact, I was a pioneer myself, though a very small one. I was only three years old when I came with him. We don't do much in the way of irrigation in Wisconsin. We don't have any necessity for it. We have some cranberry marshes that need to be irrigated. We have the problem of drainage and navigation to contend with, or to solve.

I don't know whether I can persuade you that we are one of the greatest states, but I may make some of you think that we are next to it. I went down to Miami, Florida, a few years ago to see what kind of sleighing they had down there in the wintertime, and I found that an enterprising gentleman had built a moderate sized hotel alongside one of Flagler's big hotels, and he advertised his hotel as "next to the largest in southern Florida." (Laughter.) Now, if I cannot make you believe that Wisconsin is the greatest state, I may possibly make some of you think that we are next to it. (Laughter and applause.) If it is Michigan, if it is Minnesota, if it is Iowa, if it is Illinois, we are next to it. (Laughter.) And I am almost sorry that I cannot say that we are next to South Dakota after hearing Brother Wood's able address. (Applause.)

I thank you for the opportunity of saying that Wisconsin is here, and that it is with you, and that we will do everything that we can for the improvement, not only of our own state but of all of the states in the Union. (Applause.)

WYOMING

A DELEGATE: Mr. Schenk was delegated to answer for our state, but he does not seem to be here.

MR. A. B. BARTLETT, of Wyoming: Wyoming is a pretty dry state. We are doing all we can in the way of development—

PRESIDENT FOWLER: Won't you come up on the platform?

MR. BARTLETT: I will.

Mr. Bartlett read extracts from a paper as follows:

MR. BARTLETT: The arid and semi-arid region of this country in which nearly all of our public lands are now located extends from western Nebraska to the Pacific Coast and from British Columbia to the Mexican boundary.

With the exception of the precious metals, all these great native resources of the West are locked up and their development suppressed by the sweeping withdrawals of these lands and resources made by the President under the sanction of Congress and in accordance with a pleasing political and economic delusion which is expressed in the term "Conservation."

If the material development of the arid states is thus arrested, we cannot ignore its damaging effects upon the irrigation farmer and all irrigation enterprises, large and small.

It goes without saying that the value of irrigated lands must depend largely upon the development of the resources of the surrounding country, its growth in population and the means of transportation which such industrial developments would bring, and the markets that would be created.

True "Conservation" is the proper use and development of our

natural resources at the present time, without waiting for the consent of our great-great-grandchildren, or their succeeding generations.

The fantastic theories of conservation now being urged upon and practiced by the federal government are not only destructive to the progress and development of the public land states, but of the whole nation, and are utterly at variance with scientific and economic facts.

I speak of this at the outset, because if this policy is to be continued and expanded as the conservationists now insist, this Irrigation Congress, which has for its prime purpose the agricultural and industrial development of the great West, will have little or nothing to do in the future. Its occupation will be gone, as these withdrawals by proclamation will continue until every acre of valuable mineral or agricultural land will be taken from settlement, use or occupation by the American people, except as tenants of a government landlord.

This economic fallacy has been sent broadcast over the land in millions of bulletins issued by bureau clerks under the sanction and at the cost of our national government, until it is believed by vast numbers of our best and most intelligent citizens. It has been exploited by all the popular-magazines. Hence, we are obliged to treat these statements seriously and give the real scientific and economic facts, which show conclusively that never in our history has there been such a remarkable output of developed native products or such enormous areas of undeveloped resources as have been recently discovered and defined by scientific investigation.

Take coal for instance. In a press dispatch of March 14, 1908, Mr. Pinchot said:

"There is in this country now timber for less than thirty years, and coal to last for less than one hundred years."

As a matter of fact a special survey of our coal resources made by the United States Geological Survey in 1897 and 1898 shows an aggregate of coal deposits in the United States of 3,076,204,000,000 tons. Taking the annual output of coal consumed in this country, amounting to over four hundred million tons, it will be found that we have coal enough on hand in the ground to last this nation over 7,000 years.

There never was a time when the wealth of our country was so great and our resources so abundant, and science has determined by investigation and exploitation that these natural resources are practically inexhaustible for centuries to come in the ordinary course of nature, notwithstanding the campaign of misrepresentation which has so far misled many of the honest and conscientious leaders of the people in Congress and out.

Its effect is exactly the opposite. Our present policy gives the trusts and corporations more supreme control than ever before. By preventing the further exploration and development of our great natural resources through individual and independent projects, the government transfers the whole body of consumers to the tender mercies of the monopolists already in control and makes them impregnable to competition. The simple law of supply and demand proves this.

The coal monopoly, the lumber trust, the oil syndicates, the iron ore trust, and the whole brood of monopolists now fattening upon the people, have the United States as a partner and should in justice pay over a portion of their profits to the government. Formerly these trusts, in order to maintain prices, would get together and close down some of their plants in order to restrict the output.

Is it any wonder that 500,000 of the best American citizens have, within the last few years, found homes in Canada and sworn allegiance to the British Crown? In this movement it is estimated that

they have taken \$250,000,000 in productive capital from the United States.

The pioneers and empire builders of the West are entitled to better treatment from the national government. The men who are braving the hardships and vicissitudes of the great mountain ranges, who are making the desert blossom as the rose, who are ranging their flocks and herds upon a thousand hills, who are wresting from the rocks their wonderful treasures, are the equals in manhood, intellect and integrity of the citizens of any of the older states and are entitled to the same rights and privileges accorded them. What they have so far accomplished is the marvel of the century and yet their grand work in hewing of the pathway of empire is but just begun. Why should they be called upon to surrender the job?

The gentleman from South Dakota has said that Paradise is just half a mile from his state; going west one-half mile would land you in Wyoming. If Paradise is in Wyoming, we want to have it developed and withdrawn from government bureaus. We want to develop Paradise.

At this point Mr. Bartlett's time expired.

MR. BARTLETT: With the consent of the Congress I would like to have this published in the record. (Offering paper.)

MR. HORACE W. SHELEY, of Utah: Mr. Chairman, I move that it be printed in the official record of the proceedings.

PRESIDENT FOWLER: Is this motion seconded?

A DELEGATE: I second the motion.

MR. A. R. SPRAGUE, of California: Is that debatable?

MR. SHELEY: I believe, as the maker of the motion, I should have a chance to say a few words. There are many of us who believe in real conservation, but we do not believe in obstruction. We know of cases where the department is absolutely inactive upon some projects. Not only does it regard them as unworthy, but it simply shelves them, and that is one phase that is brought out by a resolution, that such projects are being held back. This address simply points out that there are such troubles, and I think it is best to air them and have them made right.

MR. SPRAGUE: I seriously object to the incorporation of this paper into the record because it is, in the first place, extremely irregular; it is extremely unfair to have a matter so important as this would appear to be from the extraordinary statements incorporated in it, placed before this convention without an opportunity for further discussion by those who agree with its conclusions and those who question its assertions. Then there would be no objection to its being incorporated into the record; but, sir, as I understand it, it is not at all in harmony with any sort of regular parliamentary proceeding to incorporate in the report of the speech of the gentleman anything more than belongs in his utterances made within the time accorded him, and for these reasons I think it would be extremely unfortunate if this convention should agree to the incorporation of the whole paper at this time. I am not at all sure but that, if there were an opportunity for full discussion of the matter, and a thorough airing of opinion on one side and the other, that it might not be to the advantage of the Congress to incorporate it; but certainly, sir, it seems to me it does not belong there now.

PRESIDENT FOWLER: Had I not recognized Mr. Sprague of California before the gentleman who made the motion desired to make a few remarks, I should have stated the policy of the Program Committee. The policy of the Committee has been that papers that are not presented at length are to be presented to the Program Com-

mittee first and passed upon by them before a decision is made as to the including of those papers in the official printed proceedings; but the motion is now before the Congress and seconded.

DR. W J McGEE, of Washington, D. C.: May I offer a suggestion? In the interest of convenience I will put in the way of a substitute, which, I hope, will meet the requirements of the gentleman from Wyoming, that is this: that the full paper be referred to the Executive Committee, with a view to its incorporation in the proceedings, if in their judgment it is desirable to do so; and let me merely remark that what I have in mind is the Executive Committee not yet created but to be appointed in due course.

PRESIDENT FOWLER: Do you hear the motion made as a substitute? Is it seconded?

MR. DWIGHT B. HEARD, of Arizona: I would like to second the substitute to the motion.

MR. SHELEY: Is it the intention to consider it in the coming Congress?

PRESIDENT FOWLER: No, to be considered by the new Executive Committee, which has not yet been appointed, at their first meeting.

Upon voting the substitute was adopted and the motion as amended was unanimously carried.

PRESIDENT FOWLER: It will be referred to the new Executive Committee.*

MR. BARTLETT: Gentlemen, I thank you.

PRESIDENT FOWLER: There will now be given three minutes to the Pan American Exposition—the San Francisco Exposition.

THE PANAMA EXPOSITION

JUDGE JOHN FAIRWEATHER, of California: Ladies and Gentlemen of the Congress: You are all aware that the government is building the great Panama Canal, and I suppose you are all aware that San Francisco has been selected as the Panama Exposition city in 1915.

San Francisco alone has voted an appropriation of seventeen million dollars, the State of California has provided five million dollars, and the most of the counties in the state are voting a tax of six cents on the hundred dollars on their assessed valuation to provide funds for the Panama Exposition.

Now we shall all want you and you will all want to come to California in 1915 to that exposition, and we cordially invite you. California is not modest in some things, but we are occasionally. I fully expect that we shall want you to come as the National Irrigation Congress to California in 1915, and Fresno, the gem of the Pacific ocean, will be in a position at that time to invite you. We will show you the grandest city in the world and we will feed you on raisins, milk and honey, and will show you the largest wineries in the world. I should have included wine in the milk and honey.

Now, I only asked for three minutes. Just remember that we shall all want you and expect you to come. I want to say that if you will come there we will place you in Paradise. I thank you.

PRESIDENT FOWLER: The Secretary has a telegram to read to the Congress.

SECRETARY HOOKER: A telegram to M. H. Walker from

*By action of the Congress Saturday morning, Mr. Bartlett's paper was referred to the existing committee. At a meeting of the Board of Governors it was decided unwise to print controversial matters which had not been presented before the Congress, for which reason there is printed only those portions of Mr. Bartlett's paper as given above.

Joy H. Johnson, President, and Joseph E. Caine, Secretary, of the Commercial Club of Salt Lake City:

TELEGRAM FROM SALT LAKE CITY COMMERCIAL CLUB

Salt Lake City, Utah, Dec. 7, 1911.

M. H. Walker, La Salle Hotel, Chicago, Ill.:

Commercial Club extends cordial invitation to Irrigation Congress to hold its 1912 meeting in this city. Excellent entertainment will be provided for all delegates and it will be made the most notable meeting in the history of your Congress.

JOY H. JOHNSON, President.
JOSEPH E. CAINE, Secretary.

A request has come that I announce from the platform that tickets should be presented for validation as promptly as possible, in order that the reduced rates offered conditionally by the railroads may be obtained by all the delegates, if there are a sufficient number here having the certificates.

PRESIDENT FOWLER: The next will be the address on the subject of "Drainage the Complement of Irrigation," by the Hon. James R. Garfield.

Address by

James R. Garfield

Former Secretary of the Interior

DRAINAGE THE COMPLEMENT OF IRRIGATION

Mr. President, Ladies and Gentlemen:

I do not believe that I can add anything to what was said last night on the general subject of drainage and its relation to irrigation. I simply wish to express my very great gratification that this question of drainage is now receiving the proper consideration, and the enthusiastic consideration that it is, in connection with the general subject of reclamation.

We people in the middle portion of the country and in the East, where there are swamp lands, have for some years been working for the drainage proposition. When, as Secretary of the Interior, I had occasion to give this question consideration, I saw immediately the close relation between irrigation and drainage and that the problems of irrigation were in a great measure the problems of drainage, and it has been my hope that these two great works should be carried on in harmony and that neither should interfere with the other, and that there should be no opposition or conflict between the proper claims of the irrigators and the drainers.

That the federal government can and ought to do much for drainage, I am sure. That it has the power to do much for drainage, I am likewise sure, and I am confident that by careful, close study, thorough investigation of the laws of the various states and the condition of the lands in these states needing drainage, a thorough study by the national government as to what it can do toward aiding in the work of drainage, that there can be evolved a plan that will be quite as satisfactory as any plan for irrigation.

I am likewise confident that this can be accomplished only if the people who are interested in it will themselves prepare and outline the problem and the plan, and will then go to the federal government and to the states, having back of them the entire sympathetic support of the people of this country.

It was only when we obtained the support of the East and of the South that irrigation was made possible under the federal act, and it will be only when we obtain the sympathetic and active co-operation of all sections of the country that we will be able to obtain from the federal government what is necessary and what is right for the purpose of doing the great work of drainage. (Applause.)

Now the only thing in my mind last night, and that is still in my mind, is the question of how best to effect and work out these problems, and it is to this that this Congress and those interested in drainage should give the most careful, thorough consideration.

It is unfortunate that there should have been an impression gotten out that the movement of those who are interested in drainage is a movement that is in any way splitting up the work of this great Congress. I know from those with whom I have talked that there is no such purpose in anybody's mind. On the other hand, it must be made equally plain that when action is taken, that that action will be in a spirit of the heartiest co-operation; that there must be an indication of the interest of all of those who are now studying the problems of the use of water. We must go before Congress with something conclusive on the problem, so thoroughly worked out and with a suggestion so clear and practical that we can command, as I said a few moments ago, the co-operation and support of every member of this Congress and of the people in the West as well as in the North and in the South.

Therefore, any action that is taken should be well considered, not hastily; should be action that looks towards close co-ordination, and close co-operation; not subdivision of effort, or any possibility of conflict in the years to come, and thus, I hope, that this great problem of draining seventy-odd or eighty million acres that we now see ahead of us will be immediately taken up, so that work can be commenced or carried on where it is already commenced, in a better way, to the end that we may look forward in this generation to seeing a large portion of these lands reclaimed and put to profitable use. (Applause.)

PRESIDENT FOWLER: The next will be a paper on "Irrigation Finance," by Norman E. Webster, Jr., of New York City.

Address by

Norman E. Webster, Jr.

Certified Public Accountant

IRRIGATION FINANCE

Mr. President and Delegates: The fact that my place finds itself on a morning when a part of yesterday's program has been pushed over, and when following me there is the name of a very popular speaker—all of this makes it exceedingly fortunate that I have tried to touch upon only the prominent points of this subject and will leave the filling for discussion, if there is such, or for you to supply from your own information, as it affects your own situations.

Two years ago the magazines carried numerous advertisements of irrigation bonds. Circulars describing such issues were sent regularly to possible investors, and the subject of irrigation was a popular one for descriptive articles in the daily and periodical press. But conditions have greatly changed. The advertising has ceased as though bond houses feared the word irrigation, while the total of the reading articles is only a fraction of that we had year before last.

As an explanation for this situation, it is suggested that the entire industry, including those projects which are sound from every point of view, is suffering because of the misdeeds of those which were unsound; that the public now looks askance at all irrigation securities because some of them have been found to rest upon an impossible plan.

It is true that from physical causes some schemes have been doomed to failure from the start. Shortage of water, whether from naturally low flow, or prior appropriation; undesirability of land, whether because of soil quality, topography, elevation or inaccessibility; engineering defects in plan, whether of attempting to run water up hill, or placing structures in contravention of nature's permits; lack of business judgment in forecasting costs of construction and probable time of completion; these and probably other causes have contributed to the non-success of some projects as they or similar causes have been the undoing of schemes in other lines of development.

Irrigation has had no monopoly of failure. Nearly every other line of development has had its hard sledding. Railroads, both steam and electric, and public utilities of all kinds have gone through such times of trial until now their securities are among the standard investments; and even mining, which for a time apparently sought for its own every condemnatory feature of finance, has to a large degree shaken off this weight of a bad name and emerged as a reputable industry. Can irrigation do likewise? Is time alone to prove its saviour, or is something else necessary in order to place it on a solid foundation of public confidence?

Classifying broadly, there are three conditions which must be met in order to make a proposed scheme of irrigation a success; first, an available supply of unappropriated water so situated that it may be carried to cultivatable lands which are not available for agriculture except by the artificial application of water; second, a practical engineering plan for the carriage of the water to the land and its distribution thereon, so worked out that it makes reasonably sure that the system may be relied upon as permanent and able to fulfill year by year the purposes for which it was developed; and third, capital for the undertaking sufficient to complete it in good order, and at the same time, assured of ultimate return with interest for the period during which it has been tied up, and with additional profits that will properly compensate such capital for the risks taken.

I do not wish anyone to think that I would suggest that these profits should be small. Certainly, in the present stage of the irrigation industry, they should be large. The risks taken are unusual, and there is always a chance of failure from any one of numerous causes beyond the control of man and which could not be foreseen based on the information available in advance.

For after all the study that has been given to the matter of the country's water supply, the data in regard to precipitation and stream flow in many places is meagre, and does not cover a sufficiently long period to give an adequate forecast of what may be reasonably expected in the future, and therefore, of what is necessary in the way of storage and regulation. At the same time, the difficulties inseparably connected with the construction of irrigation works are so great that those who undertake to cope with the forces of nature must plan against the possibility of great expense arising from events which could not be foreseen or adequately guarded against.

The irrigation work of the federal government offers examples of these two classes of physical difficulties. In New Mexico, "the canals of the Hondo project were ready for operation in the spring of 1907, but since that date an unprecedented period of drought has existed and the flood waters of the Hondo River have been so small

in quantity that but little use has been found for the reservoir." This statement in the last annual report illustrates the effect on the project generally of insufficient data concerning the water supply.

Again in Wyoming, the Pathfinder Dam was built on the North Platte River to store water in a reservoir which was to be extended and partly enclosed by earth dikes. When the dam was well along, but before the embankments had been raised, an unprecedented rise in the river threatened to overtop the low reaches in the rim of the reservoir. Because of the consequent peril to the valley below it was considered necessary to prepare to dynamite the dam should the river actually reach the danger level, while at the same time the construction of the dikes was rushed as rapidly as possible. Unplanned for work, or planned work performed at rush speed always adds to the cost.

If then as we have seen the uncertainty of the water supply, and the possibility of unforeseen engineering difficulties are usually present in irrigation enterprises, it becomes even more important that the projects be freed if possible from other embarrassments, particularly those arising from unwise methods in financing and management. Especially is this true since it is probable that the public estimation of irrigation securities will always hinge more largely upon the degree of confidence reposed in its financial management than upon belief or knowledge of soundness in the technical matters of water supply and engineering design.

Let us examine the financing of irrigation. I shall not attempt to describe the methods of all enterprises, nor claim that in detail the description will fit any particular promotion, but I shall hope to be fair to each by being fair to all in a description of general methods. And in so doing I will have in mind only those cases in which there is apparent the purpose to deal fairly by all concerned, with of course the legitimate and necessary fundamental that the enterprise shall produce in profits a handsome return to those who shall have put it through to successful completion.

The large irrigation developments have been financed almost exclusively by bond issues. One man or a group of men has found the necessary land and water and have acquired control thereof. They have then invested some money in engineering surveys and designs and often in some development work. When the project has been brought to where its general feasibility seemed reasonably well assured, a corporation was organized to take over the proposition. For the actual cash expenditures made by the original developers they have frequently been paid in bonds or in cash derived from the sale of bonds. For the intangible assets, often consisting of the control of the water and through it of the land, by means of water appropriations which while not perfected and vested are temporarily good and susceptible of perfection—for those intangible assets it has often been the practice to issue all of the capital stock.

Thereafter the project has no means for raising money other than by sales of bonds until it shall have reached the stage when it can begin to realize on the sale of land or water rights or both.

Up to the time of the bond issue the expenditures have been for preliminary surveys, designs and estimates; for organization and promotion expenses and for the acquisition of lands and existing irrigation systems. After the time of the bond issue the expenditures will be for the final engineering, including if properly complete, topographic and location surveys and structural design; for actual construction; for general administrative and legal expense; for one or two years expense of operation and maintenance; and for interest on the bond issue.

An examination of the requirements for these several classes of expense would most certainly disclose some interesting facts, but

the information could be obtained only from the private books of account of the irrigation companies. We have, however, the published reports of the United States Reclamation Service covering over thirty projects throughout the entire arid region. While the form of these reports is not quite that best suited for projects developed by private capital, a study of the figures seems to warrant these conclusions.

The expense of organization and promotion, together with the reimbursement of original promoters for their cash disbursements, may be estimated at ten per cent (10) of the cost of construction.

The general administrative expense during the construction period may be estimated at ten per cent (10) of the cost of construction.

The duration of the construction period, counting from the organization of the company, may be estimated at from two to five years. The additional time after the completion of the construction work for the delivery of water, before collections can be counted upon as a reliable income, will average two years. And as the money for construction must be provided in advance of expenditure requirements, an additional six months must be counted upon after bond sales before the funds are disbursed. These three elements of time indicate that the interest charges on the bonds during the construction period and two years of the operating period would, at six per cent (6%), amount to from twenty-one (21) to thirty per cent (30%) of the construction cost.

I have measured these items of expense in terms of construction cost because there is usually an engineering estimate of the construction cost, while there may be no estimate of the total cost including all other expense items.

From these figures we find that the three items of initial organization expense, general expense during construction, and bond interest together entail an outlay of from forty-one (41) to fifty per cent (50%) of the construction cost.

Moreover, it should be noted that the interest charges, as computed herein, are only on the money necessary for construction, so that if the cash for all purposes is to be provided from the bond issue, the total issue must at a minimum exceed the actual cost of engineering and construction by from fifty (50) to sixty-five per cent (65%), according to whether the project will require from two to five years for building.

And further these figures are based upon the sale of bonds at par. If, however, they net the company less than par, the amount of the discounts and commissions must be provided for by an increase of the foregoing excess over construction cost.

Having investigated the financial requirements of irrigation, let us examine the security it has to put behind its bonds. The trust deeds usually mortgage all of the company's property, real and personal, both presently owned or thereafter acquired, and as collateral require the deposit of contracts for the sale of land or water rights or both to the extent of from one hundred and twenty-five (125) to one hundred and fifty per cent (150%) of the amount of bonds issued, though this additional security is sometimes waived as to a portion of the issue.

Of course these two classes of security are mutually exclusive for, to the extent that each water right contract disposes of a portion of the entire supply available for sale, it reduces the equity of the company in the physical property which it has produced. In the final analysis, the lien which the water right contract gives on the land and water is the stronger security, but 'until the project is well along toward completion there is no assurance that this security will ever be perfected by providing the water which will give the land

its possible value. Pending the time when completion is assured, the security rests wholly or mainly on the value of the property mortgaged, rather than on the land to be irrigated.

But if the funds for all purposes are derived from the bond issue then, as we have seen, the other expenses, not including bond discounts and commissions, will require from fifty per cent (50%) to sixty-five per cent (65%) of that required for construction, so that, of the entire proceeds of such bond issues, only sixty-six and two-thirds per cent ($66\frac{2}{3}\%$) to sixty per cent (60%) will be available for actual building operations. Such an investment in tangible property does not of course offer a real security for the bonds, the safety of which then rests on the successful completion of the enterprise. They then lose the element of security which should be a prerequisite for a bond and become preferred speculative investments in the whole project. And yet there is no way to improve the security behind the irrigation bond during the construction period, unless provision can be made whereby these general expenses, and especially the bond interest, are provided for otherwise than from the sale of bonds.

How then shall irrigation be financed in order that projects shall be equal to carrying interest and general expense until water right contract collections are supplying an income sufficient to provide for such interest charges and a sinking fund for the bonds?

First, by a bond issue the proceeds of which shall be sufficient to provide for all construction and engineering, and for the purchase of lands and existing irrigation systems, and shall be restricted to such uses.

Second, by a preferred stock issue, the proceeds of which shall be sufficient to provide for the promotion and organization disbursements, the general administrative and legal expenses during construction and the bond interest until the latter is supplied from water right contract collections.

Third, by a common stock issue for the intangible assets acquired from the original promoters.

By this method the bonds will at all times have as security construction work and available cash equal to one hundred per cent (100%) of the bond proceeds, while the water right contracts deposited as collateral will be a better security than now, inasmuch as the investment by the preferred stockholders will give increased likelihood of the efficient and speedy completion of the construction work. The preferred stock should be preferred as to assets, and guaranteed a fair return for the period of its investment and might properly be subject to retirement under prescribed conditions after the collections were sufficient to provide both interest and sinking fund for the bonds.

When thus retired the further profits of the undertaking would, as now, belong to the common stock. The plan herein proposed does not at all affect the status of the present stock. It does, however, distinguish between the investment and speculative features of the present irrigation bond by providing that the speculative element shall be assumed by the preferred stock, thus leaving the bond with a security whereby it could well be styled an investment proposition.

Almost certainly the present depression in irrigation development is only temporary, and must eventually give way to renewed activity. And this will follow, not because promoters, bankers, engineers, contractors or even accountants desire it, but rather because the increased population and the popular demand for better living combine to make it necessary that large additional areas be placed under cultivation.

It is nothing new to call attention to the fact that the land available for agriculture as formerly practiced is largely exhausted. In

this statement, repeated so often that it has become a platitude, is the hope of the irrigation industry. But as an important aid in putting irrigation on its feet again, a rehabilitation of its scheme of finance will play an important part. (Applause.)

PRESIDENT FOWLER: A few weeks ago there came to my home office a gentleman who expected to be here to-day, and address the Congress. He has left a letter to be read.

LETTER FROM S. McINTOSH, DIRECTOR OF IRRIGATION FOR SOUTH AUSTRALIA

Chicago, Illinois, November 7, 1911.

Hon. Arthur Hooker, Secretary of the National Irrigation Congress, Chicago, Illinois:

Dear Sir: In presenting my credentials as representative for South Australia at the Nineteenth National Irrigation Congress, I desire to express my regret at not being able to remain in Chicago until the actual date of the conference in question.

Before leaving Australia I talked the matter over with Mr. Elwood Mead, of the Victorian Water Supply Board, who was of the opinion that the Congress would be held, judging from prior dates, on or about September. I therefore made my arrangements accordingly. On my arrival in Great Britain I communicated with the American office for the purpose of ascertaining the actual date of meeting, when I was informed that the date had been fixed for December. This alteration effectually prevents my attendance, a fact that I very deeply regret, as I can assure you of my looking forward eagerly to the opportunity of meeting the master minds in the irrigation and reclamation movement in this great land of yours.

As you are aware, in Australia we are just awakening to the value of irrigation as the great factor in the successful occupation of large areas of our otherwise arid soils.

As you are no doubt aware, Mr. Mead is carrying out, in behalf of the Victorian Government, a number of schemes which bid fair to be amongst the most successful irrigation ventures yet attempted, and right here, on behalf of the other Australian States and irrigators throughout the Commonwealth, I desire to record the opinion that the states and irrigators in question are under a lasting debt of gratitude to Victoria for securing the services of such an eminent irrigationist as our mutual friend, who I understand did much good work in America before leaving for the 'Land of the Southern Cross.'

In New South Wales the government is carrying out the largest scheme of water conservation and irrigation that has yet been dealt with in Australia. A very substantial dam is being erected at a cost of several million dollars to impound the water of the Murrumbidgee River. You have, no doubt, read or heard of the wonderful Sydney Harbor, one of the finest and largest in the world. The area of water contained in this new irrigation project, known as the Burrunjack, is one-half greater than the water contained in the Sydney Harbor. It is proposed to irrigate about one-half million acres of land below the weir.

The soil contained in this area is exceptionally well adapted for successful and profitable irrigation and I feel justified in expressing the opinion that this will become one of the finest, if not the finest, areas in the Southern Hemisphere.

Other schemes are being discussed in this state, but as far as I am aware, it is not proposed to deal with any of these until such time as the Burrunjack area has been fully occupied.

In South Australia we are carrying out a number of works of

lesser magnitude but it is expected that within the next comparatively few years we will have an area of at least 200,000 acres under irrigation in what is known as the Murray Valley.

At present the principal site being dealt with is what is known as the Cobdogla scheme. This is watered from a natural reservoir containing 4,000 surface acres and having an average depth of from fifteen to twenty feet. This reservoir is filled by the annual overflows from the River Murray itself. It will be necessary to erect a weir to maintain the depth of water specified.

At a conference of State Premiers held last January, South Australia secured the right to control another and larger natural reservoir known as Lake Victoria. This is also filled by the annual overflows of our principal river.

The actual quantity of water proposed to be impounded in this basin is estimated to provide two years' water supply for one-quarter of a million acres of land.

A number of other schemes of lesser magnitude are also under consideration. The majority of these will be supplied with water conserved in storage dams from the mountains.

Another field for the extension of irrigation, which is under consideration at the present time, is the artesian supply. It has been ascertained that the artesian belt covers a very considerable area of the arid portion of the states, and although much of the water secured from this source contains too large a percentage of alkali for successful fruit or forage culture, experiments are being carried out which lead us to hope that at no great distant period of time the more injurious alkalies will be either neutralized or counteracted by the use of certain chemicals in the water before it is applied to the soil.

Legislation is being adopted in Southern Australia to provide for the better control of irrigation projects. Good practical work in the matter of determining the minimum quantity of water required for maximum crops is being carried out by the Agricultural Department under the irrigation division. Up to date it is found that twenty-four inches is sufficient for all general requirements and this quantity is the allowance made for the annual rate payment. With the hope of inducing the irrigators to use the absolute minimum, it is proposed to grant a rebate of one-fourth of the annual rate to such irrigators as use a depth not exceeding eighteen acre-inches.

In all of the irrigation schemes being carried out at present, wherever the soil is of a sandy and porous nature, the banks are being lined with concrete.

I would state in passing, that the machinery for mixing the concrete in question has been secured from Chicago.

Water is supplied to the settlers through a meter known as the "Dethridge." Mr. Mead has tested the meter in question in the most exhaustive manner and is satisfied that it is the most efficient that has yet been placed before the public.

As I will not be present in person at the Congress, I take this opportunity of recording this brief statement, showing the irrigation progress in Australia, just by way of advising my fellow irrigators of America that we are benefiting by their past experiences.

Wishing the Nineteenth National Irrigation Congress success in its deliberations, and with fraternal greetings from the the "Land of the Southern Cross," I remain,

Yours very sincerely,

S. McINTOSH,

Director of Irrigation for South Australia.

PRESIDENT FOWLER: I take the opportunity to read this just at this particular time because it is an illustration of the idea that I have of the influence of this Congress. Organized twenty years ago

in the State of Utah, it has reached out to the Atlantic on one side, to the Pacific on the other, and from the Gulf of Mexico to Canada. But it has not stopped there. I have another communication which we will read this afternoon from Cuba, from a delegate who attended at Pueblo, and I want you to see what the results have been in Cuba since the Pueblo Congress. There is no measuring the influence of an organization like this. It is not limited to the hall in which the meetings are held, nor to the state or city in which the sessions are held. It shows you, or gives you an idea of the spread that we have had; and we have other communications from other sections of the country, and from other countries, who have sent delegates to the Congress during the last twenty years. Probably twenty-five or thirty foreign nations have sent delegates to this Congress during the last few years.

I recall one case from Chile, in which the delegate reported that the Congress of Chile regarded this Congress of such great value that they made a special appropriation to send their delegate to the Congress, and it was his expectation to be here this year, but he is not here at this time. These are facts of very great interest to the Congress, to the states where irrigation is being done, and to every patriot in the country, to know that work of an organization like this is going on, not stopping at state boundaries, or national boundaries.

I desire now to present to the Congress another Australian, Honorable Niel Nielsen, formerly Minister of Lands of New South Wales, Australia, who will speak to the Congress this afternoon. He came pretty near not getting here. I think he only got into the city a few moments ago. (Applause.)

President Fowler here presented Mr. Nielsen to the Congress.

MR. NIEL NEILSEN: I thank you, Mr. President.

PRESIDENT FOWLER: The next on the program will be an address by Honorable Gifford Pinchot, President of the National Conservation Association, of Washington, D. C. (Applause.)

Address by

Gifford Pinchot

President National Conservation Association

Mr. President, Ladies and Gentlemen and Members of the National Irrigation Congress: When I was asked to come here and address you the subject assigned to me was that somewhat vague and general one, "Problems of the Government." In other words, I was given free scope to talk about anything that I liked. Under that subject I might have expressed to you my opinions on the tariff, for example, which are very briefly that the last tariff was made by the servants of the special interests and under the orders of the special interests. I might have talked to you about the trusts, and have expressed to you my very definite opinion that a decree of the court which distributes a trust into its component parts, under the same old leadership, and under which the value of the stock on the market which was originally based on monopoly, so that profits remain at the same, or a higher point, does not really do the public much good. But I am not going to talk about things that verge on politics. I want to talk to the Congress for a little while on the sort of thing that I have had the honor of addressing it on before a number of times, and to report to the Congress what we expect to accomplish in conservation during the coming year, and some of the things that I think ought to be touched upon that have already been done.

First, I want to say this: that the Forest Service, under my successor, Henry S. Graves, is doing, and continuing to do most admirable work. I report that to you here for this reason, that the Irrigation

Congress, through George H. Maxwell, and the power that came through this Congress and from him and from behind the passage of the Reclamation Act was, at one time, and for a number of years, the thing that saved the Forest Service. You will remember how, year after year, Senator Heyburn and other people of his kind in Congress, with appropriation bills, tried to destroy the Forest Service. That effort, in my judgment, would have been successful if the influence of the irrigators and the irrigated states, with their representatives in the Senate and the House, had not stood behind the things the Forest Service was trying to do. In other words, the practical application of your motto, that "The Forest is the Mother of the Fountain," saved the Forest Service at a time when it was in very dire straits.

We never let the other fellows know how bad our trouble was in those days, and now we do not care if they do know, because the Forest Service has passed beyond any danger from attacks of that kind.

Now I want to say a word about Alaska. I merely want to say this: that a citizen of Chicago, the Secretary of the Interior, Mr. Walter Fisher, of Chicago, is a good man and, in my judgment, has rendered a very great service in destroying monopoly in Alaska and in his efforts along the line of the proper development of the resources of that wonderful country, by bringing the administration around to the complete adoption of conservation. In other words, we who have been fighting for years the Morgan-Guggenheim combination in Alaska and to lay down a program to that end, now at last toward the end of that fight find the administration coming in behind that policy, uniting its efforts to ours to put that program through. It is a most cheerful outlook for the program along that line this winter, and I think we are going to get good legislation for Alaska, following exactly along the lines we have been fighting for for years.

Another matter intimately connected with your work, as many of you know—the struggle between the grazing men on the one hand and the irrigators on the other—has been at times exceedingly fierce in the West, notably in Arizona for example. I think it is perfectly clear now to all men that irrigation must come first before grazing. That, important as the grazing interest is, where it breaks in or threatens to defeat the irrigation interest, the irrigation interest must have first consideration, because that is pre-eminently the home-making interest.

Now, in saying this I am not in the least trying to take away from the vital importance of the grazing interest, which helps every man, woman and child of us every time we eat a beefsteak or a mutton chop. But the differences are being composed; the stockmen themselves have been for several years the strongest advocates of the regulation of the public range, a regulation which will have a most beneficial and widespread effect on irrigation and on the general development of the country. The stockmen are getting behind a bill, which in my judgment is right and wise and sensible, and have gotten to a point where of their own motion they are going to give us a chance in Washington this year to get through a bill extending government control over the whole public range, and doubling its capacity for producing mutton and beef and wool, a very admirable and practical measure in the way of conservation, which seems to me ought to be most welcome to everyone who is interested in the united protection and development of the different resources, about which I want to say a word later.

Now, we have been having another fight for some years closely connected with the work of this Congress. You know better than I how intimately water power is associated with irrigation through pumping. The national government for a number of years has been occupied in trying to establish this policy as against the water power men, that the exceedingly valuable rights which have been put into private hands for the development of water power ought not to be given away forever, and for nothing, to anybody who chooses to ask for them, but

that the people who owned these rights in the first place should keep control of them, in the second place, in the last place and always, and that the men who get these rights should pay the people a fair compensation for what they take from the public.

It has been a long, hard fight, but I am able to report to you now that the great bulk of the water power men have at last seen the light, that they themselves are getting ready to get behind a bill which recognizes that the public right comes first, and that we have a fair chance to get through Congress at Washington this year a water power bill which will give the water power men every reasonable opportunity—and it ought to do so generously—every reasonable opportunity to make their development possible.

We want water power development, and the men who undertake it do so at some risk, for which they should be compensated, but they ought not to water their stock at the same time that they develop water for their purposes. I believe that we are going to get from Congress this year a bill which will protect entirely the rights of the public at the same time that it protects entirely the rights of the water power men, and particularly at the same time that it leads to development. I want to report that to you.

Now, I want to speak about another matter which seems to me to be of vital importance at this time. Perhaps Mr. Garfield may have touched upon it. Unfortunately, I have not been able to hear his talk. But it is this: It is the function of our government in the Homestead Act, to make available to the people as freely as possible all lands capable of settlement. That, in a sense, is one of the fundamental principles of our government, although it was only translated into law in 1861.

We have added to that this other function, that it is not only the duty of the government to keep open lands capable of settlement on the public domain in the way I have described, but it is the duty of the government to extend the public domain, capable of settlement, by artificial means. That was the great service which the Reclamation Act did, extended the homestead area over millions of acres, available or otherwise. It is equally the function of the government to extend the homestead area by drainage as it has by irrigation, always conditioning any work of that kind that it may on this proposition: that the land must be open not only on equal terms to all men who want to make homes, but so far as is in any way possible on such terms as will prevent the settler from having to pay speculative profits for unearned increment to anybody but the government. (Applause.)

In other words, work of this kind, the great drainage and irrigation projects, are in my judgment, in their very nature, governmental functions, and ought to be kept, so far as is in any way possible, out of the hands of those who propose to tax the homemaker for their own profit.

That I know is a much disputed proposition. I know a large number of men believe that it is wiser to have irrigation projects developed by private capital, charging the home-maker a profit. My judgment is that that is a governmental function, and in all this work—drainage, irrigation, and any other method devised for extending the homestead area—the state is exercising a very proper function of its own, because the easiest thing in this country, so far as physical opportunities will permit, ought to be the making of a home. (Applause.) That is the one thing we want most of all.

This Congress of yours and of mine—for I feel as if I belonged to it, having attended so many of its sessions—as, I think you have been told, has done a very large number of things besides directly encouraging irrigation. It has been one of the most useful bodies in various ways. And I think it has recently done a thing for which, eventually, it will come to be very proud.

You heard yesterday from Mr. Maxwell of the provisions of the Newlands Bill. The principle upon which that bill is founded seems to me altogether admirable, and I think the Irrigation Congress can congratulate itself that through Senator Newlands and Mr. Maxwell it is either the father of that bill or the grandfather of it. (Applause.) When you get adopted into law and carried out by executive action the principle upon which that bill reposes, that the development of natural resources is a natural unit, when the work which the government has to do in any one line is intimately and unbreakably united with the work it has to do in other lines, a very great forward step will have been taken.

It is not only true, as we are coming to recognize most fully and as Judge Hutton said yesterday, that the water belongs to all of the people; it is not only true that a stream, with every tributary, is a unit from its source to its mouth—a great deal more than that is true. It is not only true that every use to which a stream can be put ought to be considered in every development of any kind that goes on in that stream—much more than that is true. It is true that the forests must be considered in stream development; it is true that drainage must be considered in stream development; it is true that the relation of water power to stream power comes in, that navigation and railroads are closely tied together.

As a matter of fact when you have grasped all the ramifications of the water problem in any country, you have substantially grasped, at the same time, all other physical problems of natural resource whatever. Water, as Dr. McGee has said, is the central resource. Water reaches into every other natural resource, into every field of industry, and as the development and conservation of these resources come to be grouped more and more around the central water systems of each country, so that development will be made more wisely, more effectively, and more permanently. This idea is spreading but slowly, unfortunately, but as it comes to be understood, as we gather the facts of the penetration of water into all of these other problems, as we find how impossible it is to separate the control of railroad rates, the development of our coal fields, the protection and care of our forests, the protection and care of our soils, the elimination of erosion, and all the rest of it, from the water problems which tie them together, we come to see that a Congress of this kind has a scope larger than almost any other organization that can be devised, and touching the welfare and development of the country in points, and more legitimately than any other similar body.

That is one of the reasons why I have doubted the wisdom of having the drainage men split off, even in appearance, from the irrigation men, because I am persuaded—and I draw that persuasion from the whole story of my experience in forestry and in conservation—that when the last word has been said, it is water that makes the world go round, not money that makes the world go round, and that the bodies which deal with water have their fingers, in a way which can be applied to no other thing, and have their grasp on all of the things which vitally affect the welfare of any country—either in the present or in the future.

I thank you. (Applause.)

PRESIDENT FOWLER: The Chair desires to say that for any of the achievements of Mr. Pinchot or Mr. Maxwell or Mr. Newlands—I should have placed him first—or Mr. Newell, for any of the achievements of that sort, from that source, we assume the responsibility. They have been intimately associated with this work for twenty years, and we are all, all of us, both as an organization and as individuals, proud of each one of them for the contributions they have made, both to forestry and to irrigation. (Applause.)

A note was received this morning from Professor T. U. Taylor, Professor of Civil Engineering, University of Texas, saying that he was obliged to leave on account of illness, consequently his paper will not be read.

There being nothing more on the program, this session stands adjourned until 2:30 o'clock this afternoon in this auditorium.

A recess was then taken until 2:30 o'clock p. m. Friday.

NINTH SESSION

FRIDAY, DECEMBER 8, 1911

2:30 o'clock P. M.

AUDITORIUM THEATRE

The ninth session of the Congress was called to order by President Fowler at 2:30 o'clock p. m.

PRESIDENT FOWLER: We have a communication here from the Western Canada Irrigation Association, and also one from Senor Canova, of Havana, which I will ask the Secretary to read in order that they may go into the official proceedings of the Congress.

SECRETARY HOOKER: A letter from the Western Canada Irrigation Association, signed by W. R. Ross, President; Norman S. Rankin, Permanent Secretary; W. H. Fairfield and H. J. Cardell, Delegates, and Herbert Vanderhoof, Editor Canadian Monthly Magazine:

LETTER FROM WESTERN CANADA IRRIGATION ASSOCIATION

Calgary, Alta., December 7, 1911.

Arthur Hooker, Esq.,

Secretary National Irrigation Congress, Chicago.

Sir. The Western Canada Irrigation Association, upon this very important occasion to us of our first official attendance at the National Irrigation Congress, cannot let the occasion pass without expressing to the Congress as a whole, and the Foreign Committee in particular, our hearty appreciation of the extreme kindness and courtesy which have been extended to us since our arrival in your city, and the plans which have been made for our entertainment.

We feel that we have been made, and are, welcome, and that at future Congresses, in which we hope to have the honor of participating, we will find ourselves again amongst the many friends whom through the splendid program of the Foreign Committee we have been enabled to make. Our association is young in years, but vigorous in action and endeavor, and that we may know each other better and co-operate in those things which may be of mutual benefit to us, we herewith extend you a cordial invitation to send a delegation to the next annual convention of the Western Canada Irrigation Association, which will be held at Kelowna, British Columbia, some time in the early part of the month of August.

We express our thanks to the Chairman of the Chicago Board of Control, the Honorable R. R. McCormick; to Mr. Park, Vice-President Illinois Central Railway; to Dr. W. A. Evans, Chairman of the Committee of Foreign Delegates; and to our good friend, Dr. E. McQueen Gray, Foreign Secretary; and to all other individuals or associations to whom we are indebted for entertainment or attention.

On account of the excessive hospitality of which we have been the object, our participation has been impossible on all occasions, and we only trust that the National Irrigation Congress will accept our sincere invitation to take part in our Kelowna convention, and allow us in some

small measure to return the many kindnesses received at your hands.

We have the honor to inscribe ourselves,

(Signed)

W. R. Ross, President.
Norman S. Rankin, Secretary.
W. H. Fairfield, Delegate.
H. J. Cardell, Delegate.
Herbert Vanderhoof,
Editor Canada Monthly Magazine.

SECRETARY HOOKER: A letter from Senor L. J. Canova, No. 7 O'Reilly Street, Havana, Cuba:

LETTER FROM SENOR L. J. CANOVA

December 1, 1911.

My Dear Mr. Hooker:

I am exceedingly sorry that I will not be with you at this session of the Irrigation Congress, and I beg that you express to Dr. Fowler and the many friends I made at Pueblo, where I attended the Congress as a delegate from Cuba, this regret on my part. That the present session of the Congress may be as fruitful as those that have preceded is my hope, but my sincere wish is that it will even accomplish more—will surpass its former work in spreading its beneficent doctrine—"Save the forests, store the floods, reclaim the deserts and make homes on the land."

I have been an earnest worker for this gospel for a number of years and I am happy to state that partly through my efforts and the efforts of others—and the good effect of the Eighteenth National Irrigation Congress—Cuba has awakened and is now taking active steps to provide intelligent irrigation for the tobacco growers of western Cuba.

The Cuban government has secured the services of Mr. D. C. Henny, recommended by the Reclamation Service of the United States, who with Mr. Eduardo A. Giberga, Professor of Hydraulics and Mechanics in the University of Havana, and a graduate of Lehigh (1895), began the preliminary studies last August. They are to be later joined by Mr. George H. Wigham, recommended to this Republic by the British government as an engineer having experience in irrigation in Egypt.

This International Commission has recommended that in the vicinity of the towns of Pinar del Rio, San Luis and San Juan y Martinez, as the stream supply is not adequate, that a number of small pumping plants be installed. Wells and streams will furnish water for these systems, which are to irrigate one or more vegas (as the tobacco farms are called). It has been estimated that these plants will cost, approximately, \$2,500 each. In view of this recommendation it is proposed that the present Congress pass a law appropriating the sum of \$500,000 annually for four years for the purpose of establishing this system. The *vegueros*, as the tobacco growers are known, will reimburse the government for the cost of the plants in nine equal annual payments, but no payment is to be made the first year.

For the Remates district, where wells cannot be used, as the water is brackish and ruins the tobacco when applied, it is intended to construct a larger system, taking the water either from a chain of lakes or from the Cuyaguatete River, either being some miles distant. This section is considered to be the best tobacco land known to man, and until such an irrigation system is established rain is its sole dependence for water. Owing to this condition many of the tobacco crops in the Remates district have been short and this rich section has been prevented from developing as it should have done. The introduction

of water as now contemplated will make this famous district a marvel of production and richness, while the land of that favored zone will be difficult to secure at any price.

President Gomez and Secretary Emilio del Junco, of the Department of Agriculture, Commerce and Labor, are deeply interested in the project, realizing the importance it represents, as Cuba is primarily an agricultural country and her future prosperity depends upon agricultural development.

By the above you can see that we, in Cuba, are endeavoring to follow the precepts of your-gospel and hope that the faith which is now springing into life here will soon reach the dimensions of a powerful religion.

Although not with you in person, I am in fact just as much with you in spirit as if I were present in the Congress hall. May your meetings never grow less, but instead, my sincere hope is that they will be open to the admission of delegates from Cuba.

Sincerely yours,

(Signed) L. J. CANOVA.

PRESIDENT FOWLER: These letters as read will appear in the official proceedings of the Congress.

The first paper for the afternoon on the program will be on "Irrigation from Reservoirs," by Mr. Horace G. Clark, of Colorado. It appears on the program as the last item, but Mr. Clark has requested that he be pushed along, inasmuch as he has an important engagement which he has to make, and it will be a great convenience to him, and the gentleman who was to speak first has been kind enough to agree to the change.

Address by

Horace G. Clark
of Colorado

IRRIGATION FROM RESERVOIRS BY THE EXCHANGE SYSTEM OF THE CACHE LA POUDE VALLEY

Mr. President, Ladies and Gentlemen: Just before leaving Colorado, some of my Greeley friends came to me, and among others Mr. Insinger, a brother of the Mr. Insinger who is Chairman of the National Executive Committee, and said to me: "Clark, we would like to have you tell some of these eastern fellows something about our system of irrigation in the Greeley district, and we want you to promise that you will do it, and we are going to have you put on the program." So I somewhat reluctantly consented.

Now, I beg to call your attention at present to the fact that I am not a public speaker; I am simply a farmer and builder of irrigation systems and ditches and reservoirs, in which business I have been engaged the better part of my life.

For a great many years I was a resident of Greeley, Colorado, during which time I contributed something to the marvelous development of that section of the country with reference to which I am going to give you a brief sketch. I beg to say at the outset that my contribution will at least have the merit of brevity. I have entitled this little sketch "Irrigation from Reservoirs," and it has reference to the Cache la Poudre Valley or the Greeley district.

An observing passenger riding from Denver to Cheyenne on the

Denver Pacific Railway would notice, about one mile north of the City of Greeley, an insignificant looking little stream, scarcely entitled to be dignified by the name of "river," approximately 100 feet wide from bank to bank at the point spanned by the railroad bridge, and carrying, eleven months of the year, something like 25 cubic feet of water per second. That is the Cache la Poudre. If the said observing passenger was informed that this modest little mountain stream was entitled to the credit for the existence of the thriving City of Greeley, with a population of 10,000 souls; of Eaton, eight miles farther north, population 3,000; Ault, 12 miles north, population 2,000; Windsor, 12 miles west, population 3,000; Fort Collins, 25 miles west, population 10,000; and numerous little villages unnecessary to enumerate; that it furnished an abundant water supply for irrigation systems serving not less than 200,000 acres of highly improved farms worth easily on an average \$100 per acre, or \$20,000,000; that without it the magnificent sugar factories of Ft. Collins, Windsor, Greeley and Eaton would never have been constructed; in short, that it supplies the water that makes possible the growing of crops annually that support a population of 50,000, the observing passenger would think it a Colorado "yarn" or a "fairy tale" from California.

Nevertheless, the foregoing is an extremely conservative statement. For we can enlarge upon the theme and truthfully assert that the return water from the lands irrigated by this stream make certain the filling, during fall and winter months, of the numerous immense storage reservoirs of the lower Platte country, east of Greeley to the State line, that in turn serve great areas of fertile land. Because prior to 1890 the surplus water of the Poudre, during May, June and July, the period of floods, rushed angrily down its channel to the Platte, frequently washing away bridges, headgates and dams, flooding the low lands, and doing great damage, and passing out of the state, augmented the flood waters of the Platte, doing incredible damage to railroads and other property in Nebraska. All of these floods, except in abnormal years, are now turned into the numerous reservoirs of the Cache la Poudre Valley, held in leash, as it were, until the "bottom drops out of the river," as irrigators put it, and then drawn upon to mature the great Greeley District potato crop, that is watered, ordinarily, for the first time the latter part of July, and which is made almost entirely from stored water; the third crop of alfalfa, and sometimes the second crop; and in the main, the great sugar beet crop, often requiring water as late as the first week in September, when the channels of the streams are dry.

Prior to the settlement of the Union Colony and Greeley, in 1870, but little farming was done in the Poudre Valley, and the ditches were small affairs, covering only a limited acreage on the first bottoms. Then followed the construction of the Greeley Canal No. 3, the town and gardeners' ditch, in 1870; then Greeley Canal No. 2, the farmers' ditch, in 1871, reaching out onto the upper benches or mesa on the north side of the river; this magnificent ditch finally enlarged to a carrying capacity of nearly 600 second feet, is said to be the first "high line" canal in Colorado, built to irrigate land above the river bottom. Its direct river supply, supplemented by stored water from reservoirs, waters 40,000 acres of land not excelled and seldom equaled in productiveness in the world, and is owned by the richest and most skillful set of farmers in the United States. Water is handled by this ditch company like money by a bank. Stockholders are credited at the beginning of the irrigation season with their pro rata of water in storage, and charged with it as furnished until "checked out." The annual maintenance charge is the lowest of any system in Colorado, and probably in the arid West.

Closely following the construction of these two Greeley Colony ditches, came other ditches in rapid succession, until, by 1880, in the

language of the Frenchman, "the appropriation was exhaust." The average flow of the stream during the then usual period of crop irrigation having been over-appropriated, many of the latest constructed ditches were unable to obtain water after the 20th of June, with the result that the then principal crops grown—small grain—were cut short because of lack of water for the second, or final irrigation. It was then realized also, that under even the oldest ditches with the earliest priorities, the limited water supply afforded by the Poudre, from the latter part of July until frost, made impossible the growing, on any considerable scale, of late crops, the raising of potatoes being confined to a limited acreage under the oldest canals. It was also discovered that the fertility of our land was being exhausted from the raising of the same crops year after year, in the main, under the majority of ditches, wheat, oats and barley; and after several years of wrangling over an inadequate water supply, stealing water from one another, beating one another over the heads with shovels, hiring lawyers to delay the enforcement of the orders of our water officials, and the like, an inspiration came to some of us—the Storage Reservoir—and in 1890 the first Plains Reservoir of any size to be filled from the Cache la Poudre was constructed, "Terry Lake," built by the farmers of the Larimer & Weld Canal, then and now the largest and longest canal in northern Colorado, 60 miles in length and with a present capacity of 1,000 second feet and serving some 60,000 acres, built by former Governor Eaton (deceased), with a decree dated January, 1879. I was a farmer under this ditch, and with others suffered from an insufficient water supply. We looked with jealous eyes on the profitable crops of potatoes grown by our brother farmers under old Greeley Colony ditch No. 2, with a decree dated 1871, calling for practically all the water in the Poudre after July 1st. We could not raise potatoes. And we had frequently to irrigate our grain crop when it was too early—when it baked the ground, turned the grain yellow, and cut the yield down one-third—for fear we would make no crop at all for lack of water later on. About one crop of alfalfa—the first—and a half crop the second cut, stuff that resembled an imitation of an alfalfa crop I have sometimes seen growing in the "dry belt" in eastern Colorado and western Kansas, and some brown fuzzy stuff in place of a third cutting. That was our condition under the Eaton ditch and other late ditches prior to the advent of Terry Lake, the pioneer reservoir of the Poudre Valley. Many difficulties attended the building of this reservoir, unnecessary to fully describe herein. Many considered it a hazardous experiment; and predictions were made that it would not hold water, or if it did, the water would be so strongly impregnated with alkali that it would ruin the land to which it was applied. Attention was likewise called to the alleged fact that reservoir dams usually gave way; and the Johnstown, Pa., horror occurred about that time, either before we finished building the outlet, or before securing the necessary funds to pay therefor, giving some of our subscribers to stock a bad attack of "cold feet," but we persevered, and after one run of water the clouds vanished, and farm lands under the Eaton ditch suddenly doubled in value. For thereafter we raised bumper crops of potatoes and everything else grown under any old ditch.

Now followed an era of reservoir construction, and by 1900, about which time I ceased to be so actively identified with irrigation systems deriving their supply from the Poudre, and became interested in systems on the upper Platte and its tributaries, there had been built, and were in operation, and supplementing the direct river flow supply of the principal irrigating ditches, the following named reservoirs, listed, as I now recall the facts, in the order of their construction, and giving approximate figures only as to surface areas, capacities in cubic feet and acre-feet; and the names of the ditches whose water supply they were built to increase:

Name	Surface Area Acres	Capacity Cubic Feet	Capacity Acre-Feet	Name of Canal Built for Purpose of Supplementing River Supply
Terry Lake.....	470	350,000,000	8,000	Larimer & Weld
Timnath.....	520	358,000,000	8,200	Union Colony No. 2
Windsor.....	700	610,000,000	14,000	Larimer & Weld
LARIMER COUNTY DITCH SYSTEM:				
Chambers Lake.....	...	55,000,000	1,200	Larimer County
Rocky Ridge.....	225	200,000,000	4,700	" "
Nos. 2 and 3.....	125	45,000,000	1,000	" "
No. 4.....	85	44,000,000	950	" "
Long Pond.....	225	175,000,000	4,000	" "
Lindenmeir.....	100	32,000,000	700	" "
NORTH POUFRE DITCH SYSTEM:				
No. 1.....	80	30,000,000	675	No. Poudre Canal
" 2.....	250	145,000,000	3,400	" "
" 3.....	165	115,000,000	2,600	" "
" 4.....	80	48,000,000	1,100	" "
" 5.....	425	230,000,000	5,500	" "
" 6.....	575	575,000,000	13,000	" "
	4,025	3,012,000,000	69,025	

During the past decade many other reservoirs have been built, while some of the foregoing have been enlarged, so that at the present time it is likely conservative to state that we have a storage capacity in the reservoirs filled from the Poudre, of 100,000 acre-feet, or more, representing water that formerly ran to waste, during the fall, winter, and early spring, and during periods of floods in the late spring and early summer, when for a limited time all ditches were drawing full heads, and a surplus was passing down the stream. While familiar with some of the larger reservoirs built on the Poudre watershed during the past ten years, and a stockholder in some of them, my time has been mainly devoted, for several years past, to the task of providing a water supply for the tens of thousands of acres immediately adjacent to the City of Denver, which has been accomplished to a great extent, I may say, through the construction of Lake Antero, in South Park, 100 miles above Denver, now completed, the largest storage reservoir on the South Platte watershed, with a storage capacity equal to approximately the total storage capacities of the reservoirs of the Poudre Valley; its Spanish name, "Antero," meaning in English "First," which, I may be pardoned for asserting, it is, first on the river, first in storage capacity, and first in value—at the very head of the class!

In the early stages of reservoir irrigation some slight friction developed during the inauguration of the exchange system, whereby a ditch company owning a reservoir, like the Windsor, as one of many illustrations, that it could fill but not use other than by an exchange with a ditch "lower down," was seeking an opportunity to trade reservoir water for river water; but one season's experience convinced the most obstinate and selfish ditch owner of the great benefit to the entire farming population by the exchange system, so that we now witness trades and exchanges between ditches and reservoirs and the river that would take an irrigator, outside of the Poudre and Big Thompson Districts, a week to figure out, one comparatively simple example being the delivery of water from Long Pond, owned by the Larimer County Ditch, into the Larimer & Weld Canal, a few rods below, and taking from the river an equivalent number of feet of the Larimer & Weld's river water into the said Larimer County

ditch; or the more complicated exchange, by which the Larimer County ditch discharges reservoir water into the Larimer & Weld Canal, which canal discharges the same quantity from its Windsor Reservoir into Greeley Ditch No. 2 and the Larimer County takes the same quantity of No. 2's river water into its (the Larimer County's) head gate—two ditches drawing water indirectly from the reservoirs they can fill but from which they cannot deliver water on to lands covered by their canals. So beneficial to all concerned, not only to the ditch and reservoir owners, but to merchants, bankers, and all interested in having the water supply used so as to secure the greatest possible benefits, and so equitable was the principle involved by such an exchange that in 1897 the following brief law, which doubtless has been forgotten by the majority of irrigators on the Cache la Poudre, for the reason that the exchange system has been so firmly established that it has never been necessary, to my knowledge, to invoke the law, was passed without opposition by our State Legislature:

"An act to provide for and to regulate the exchange of water between reservoirs and ditches and the public streams.

"Sec. 4. When the rights of others are not injured thereby, it shall be lawful for the owner of a reservoir to deliver stored water into a ditch entitled to water, or into the public stream to supply appropriations from said stream, and take in exchange therefor from the public stream higher up an equal amount of water, less a reasonable deduction for loss, if any there be, to be determined by the State Engineer; provided, that the person or Company desiring such exchange shall be required to construct and maintain under the direction of the State Engineer, measuring flumes or weirs and self-registering devices at the point where the water is turned into the stream or ditch taking the same, or as near such point as is practicable, so that the water commissioner may readily determine and secure the just and equitable exchange of water as herein provided."

This superb system of irrigation, born of necessity and improved upon year by year as experience suggested, has doubled the farming area of the Cache la Poudre and Big Thompson Valleys, and more than doubled the annual revenue per acre by enabling the growing of the more profitable crops, such as potatoes and beets which, as we have seen, was impossible under the majority of ditches under early conditions. It has resulted not only in maintaining but actually increasing the fertility of the soil by crop rotation, and the growing of great areas of alfalfa for fertilizing purposes; and has also resulted, as I have explained, in absolutely manufacturing a water supply for the thousands upon thousands of acres of magnificent land on the lower Platte, of which the Poudre and the Big Thompson are tributaries, which land in turn supports the beautiful little cities of Fort Morgan, Brush, Sterling and Julesburg, which would never have attained half their present size, nor been able to secure their thriving sugar factories, had they been limited to the water supply of twenty-five years ago. It has been the model after which other districts of the state have patterned; the pioneers of the Greeley District gave Colorado her irrigation code which, while not perfect because enacted in the earlier days of the state as the result of limited experience, has, nevertheless, been the foundation for the irrigation laws of many of the western states and territories. Her sons are filling many of the important positions in the Government Reclamation projects, and constant is the inquiry for young farmers from that district to fill the positions of superintendent of irrigation, ditch superintendents, division riders and the like, for these government systems of irrigation.

While we have accomplished much in the way of an economical use of water, I look forward with confidence to yet greater accomplishments and confidently expect to see the time, in the not distant

future, when water now required for one acre of land will suffice for one and one-half. When it will be considered evidence of incompetence for our water officials to permit a gallon of water to pass the state line, other than water arising below our last ditch and the said state line. Because the first use of the waters arising in Colorado belongs, by every principle of justice, to her people. Nor are we injuring our neighbors beyond our borders by carefully conserving the floods from melting snows, cloud bursts, water spouts, and torrential downpours by storing and applying such water to our thirsty lands. For just as the water supply of the lower Platte has been increased by extended and late irrigation on the upper reaches thereof, so will the water supply of the irrigators of adjoining states, still lower down, be increased by what we term the "steadying of the stream flow."

When all headgates, dams, flumes, syphons, checks, gates and like structures will be made of reinforced concrete, when the bottoms and sides of our canals, at least through gravelly and sandy stretches, shall be paved, thus preventing the loss of from ten to sixty per cent of the water supply in the delivery thereof to the farmer—water that has become worth in northern Colorado, and which sold last summer readily at \$10.00 and more per cubic foot per second each twenty-four hours; \$5.00 per acre-foot; water for which the city of Grand Junction paid the guileless farmers on Kahnah Creek, last spring, the sum of \$182,940.00 for eight second feet, the record price so far as I am advised!

When floods on the Plains resulting from cloud bursts and enormous precipitation will not be permitted to dump into the dry channels of our main streams, to be absorbed by their beds of quicksand, and the irrigation of the many cottonwood groves growing on islands therein, and disappear from view, but by permission of a Water Master, under proper conditions, be taken in and saved by the nearest reservoirs. For such floods are

"Like the snow drop in the river—
A moment here, then gone forever."

When immense storage reservoirs will be built by the state, for the chance to fill even once in five years, and finally, when the farmers of our entire state, emulating the spirit of co-operation shown by the Cache la Poudre irrigators in the matter of the exchange system herein described will cease the ruinous policy of litigation they have pursued for years, arbitrate their differences before committees of broad-minded farmers and public-spirited citizens, versed in the knowledge of irrigation and the needs of the state, and thus relieve themselves, to a great extent, of the burden of employing that now indispensable, highest salaried ditch officer, the irrigation lawyer. (Applause.)

MR. THOMAS KNIGHT, of Missouri: May I inquire of the Chair if this paper is open to discussion or may I ask a question pertinent thereto?

PRESIDENT FOWLER: Yes, sir.

MR. KNIGHT: I wish to ask the gentleman just one question, whether or not there has been any recent legislation or decision of the Supreme Court in the State of Colorado affecting the storage of water in reservoirs?

MR. CLARK: No, sir, nothing unexpected. There has been some useful work going on in regard to the use of water in the fall of the year, ground storage by the older ditches as against the storing of water by the reservoirs, which they have been in the habit of doing during the winter months, but I apprehend it will all be

settled up in a satisfactory manner and I see no great cause for alarm over any decision that may be rendered in reference to the subject.

MR. KNIGHT: That answers my question, I think.

PRESIDENT FOWLER: Are there any other questions? I want to say that it strikes the Chair that this is one of the most practicable and interesting papers that we have had during the session, and we thank you for it, Mr. Clark.

I wish to present to you next Mr. Manuel Gonzalez, the Consul General of Costa Rica, of New York City. He has been exceedingly interested and appreciates very much the hours and days that he has spent with this Congress. He is a man typical in his expressions of a great many representatives of foreign countries from whom I have heard similar expressions. I am glad to introduce to you Mr. Gonzalez of Costa Rica. (Applause.)

Address by

Manuel Gonzalez

Consul General of Costa Rica

Mr. President, Ladies and Gentlemen: The little Republic of Costa Rica has sent me here to accept the kind invitation of the National Irrigation Congress, not to bring you light in any respect, because you have enough to spread all over the world, but in order to learn from you, as it is difficult in any walk in life to turn to the United States without learning always something that is practical. This morning I had the pleasure of hearing some of the delegates in something like a pyrotechnic display of the great love for their states. Each one loves his state, but everybody loves better the great nation. Is there anyone that does not think that the little piece of land where his cradle was rocked for the first time is not the finest spot under the sun, who has not seen the brightest and finest star shining in the sky of his native land?

We have also our little land and our piece of sky. The Lord has provided us with the same sky and at the same time with the same sort of love of country. Here we have the new America, discovered by the power of a man and by the great enterprise of a woman, not only the present but the future paradise of humankind. (Applause.)

We don't need irrigation. This is not only true, but we have nature providing us constantly with sufficient moisture for our lands. We need reclamation, drainage of some of the splendid lands on the Atlantic coast. The best lands under the sun—remember that my cradle was not there—the best lands under the sun to produce bananas, the luscious fruit comparable only with the luscious apple and the golden orange; and we come here, as I told you in the beginning, to learn how you do it for reclaiming lands, how you steal from the waters what can be to-morrow the home of a man.

I think, when I go back to my country and present to my government the impressions that I have received here, I will have arrived at the solution of that problem. You have here all the elements; you have here the money, which is the first element in all kinds of enterprises; you have the great courage, the great activity necessary for all kinds of developments. But we have a thing which surely you have not, and you never have dreamed of; we have immense admiration for yourselves, a thing which you have not for our little selves. (Laughter and applause.)

And, following in that light, as the wise men from the East followed the star discovering the place where the Saviour was born, we will follow your paces, we will go around the world looking for

your acts, we will go around the world looking for your work, and we will find also a solution of our problems.

I have immense pleasure, the greatest satisfaction in being here and in tendering to you with all my heart and soul our thanks for your hospitality and for your many courtesies. We can not offer any suggestions for the problems that you are working out here; we are simply going to put some ornamentation to it, a little touch, I hope. So, I propose to the Congress, if it is possible and not against the rules, to establish something like an order or a decoration which could be called "Pro Bono Publico," a decoration to be watched over by the National Irrigation Congress, to be established for all good men who have done something in the interest of agriculture or irrigation or drainage and, in consequence, in the interests of human-kind; to appoint immediately as members of that decoration or that order, all the chief executives of the whole world, who are as much interested as you in the United States in the solution of these problems, to appoint as members of that order all the presidents and ex-presidents of this Congress during its nineteen years of existence, and to so continue during the coming years; to name as members of that order all who follow in the footsteps of those who have been pursuing these works, inspired by the good Lord to do something in the benefit of humanity, for "Pro Bono Publico." (Applause.)

PRESIDENT FOWLER: I am sure that you do not wonder now that the foreign representatives selected Mr. Gonzalez to respond for them at the banquet last night which was given in honor of the foreign representatives. He made one of the best speeches that was made last night at that banquet and you have heard something here that was quite impromptu, from him, speaking from his heart and representing the good will of Costa Rica for the whole United States. He expressed this sentiment last night in a very effective manner, that Costa Rica looks to the United States for its guidance and for its example, and considers our nation its powerful friend.

We shall next have a paper on "The Underground Waters of New Mexico," by Willard E. Holt, of Deming, New Mexico. Ladies and Gentlemen, Mr. Holt, of Deming, New Mexico, an old time worker in the irrigation work.

Address by
Willard E. Holt
of New Mexico

THE UNDERGROUND WATERS OF NEW MEXICO

Mr. President: Thank you. No greater compliment can be bestowed upon one than to say he is an old time irrigation worker.

Delegates, Ladies and Gentlemen: That is the way we do things in the Southwest, we work and we get results. I have been marvelously interested in all the proceedings of this splendid Congress, and my heart swells with pride as I think of the great future that lies before us.

I can scarcely stand on my feet before the Congress this afternoon and not pay a slight tribute of respect to the very efficient work done by the Secretary—he is present this afternoon—and his splendid corps of ladies and gentlemen.

You know sometimes we forget to hand out these little bouquets. We all think about them but we do not speak about it, and I think it is vastly better to present flowers while they can see them, and not after they are beyond recognition.

You know that our twenty New Mexican delegates have been so busy answering questions about our great Southwestern empire that when New Mexico's turn came to speak this morning upon the call of states, the gentleman who is a polished orator, and who should have responded to the call, was so busy outside answering questions about his state that it devolved upon me to just simply say "Hello," to the boys. We are always glad to do that. When you know us better, you will like us a lot.

We have, we know, a glorious country, a magnificent future, and all we want is the co-operation of such meetings and such bodies as this to make ourselves, with you, a paradise on earth.

I was delighted with the remarks of my friend, Senor Gonzalez. It expressed the sentiment of the foreign countries toward the United States. I want to tell you we thoroughly appreciate such compliments, and we thoroughly appreciate the courtesy and the generous feeling that has been expressed. I sometimes think if the representatives of our own country abroad exemplified a little stronger the spirit of these people, that we would be even greater than we are, and there is some considerable size to us just at present.

Exemplifying the spirit of the Southwest, I want to say to you that the most beautiful educational institutions, high school buildings, where all of the arts and sciences are taught, were built in my home city of Deming, New Mexico, this year and there was not a single vote against the issue of bonds. That is the spirit of the Southwest. That is the spirit of our great empire. All that New Mexico wants is that the truth be known concerning what she actually is, and when I speak of New Mexico I speak of the sister empire of Arizona.

In the North and East not half of the truth is known concerning our enormous resources, our faultless climate, and the influx of Wisconsin men and Wisconsin women would make New England look like a hermit's retreat.

Just at present we are thinking more of statehood and what it means to us than of political policies or political candidates. Instead of studying to find out why a black hen lays a white egg, we are going after the egg, and we are getting it.

The subject of my address this afternoon is "The Underground Waters of New Mexico."

I know that because we are one of the last possible twin babies in the sisterhood of states, you will be glad to know a little something about your baby sister who had, at her birth, more coal than Pennsylvania, more lumber than Maine, more agricultural land than five states in New England, more mineral wealth than most any other state and fewer mortgages on the homes of her happy, prosperous, progressive people than any other state in the Union.

Since the last meeting of this great deliberative body in the city of "I Can" to the present meeting in the matchless metropolis of "I will," the empire builders of the mighty Southwest have induced the Congress of the United States to add two more stars to the proudest banner of civilization, there to remain until Gabriel's trumpet shall summon the human race to a land almost as fair as the one to which I shall direct the attention of this Congress.

A budding historian of the twentieth century has recently declared that one of the smiling valleys of New Mexico was the original "Garden of Eden" and that off-shoots of the original apple tree are still bearing fruit. Partial proof of this was established in my mind this year, when I saw apple trees springing from the parent root full three centuries old and still bearing fruit.

New Mexico is surely fulfilling the scriptural prophecy: "And the desert shall be made to rejoice and blossom as the rose." Isaiah might have been speaking of our region when he referred to roses,

for nowhere under the canopy of heaven do flowers grow more luxuriantly than in the great Southwest.

Do you know that I have wished a thousand times since moving from my native State of Michigan to the "Sunshine State" that all the intelligent people of our country were properly informed concerning the real condition of things. If they were, New Mexico would never again be delineated by the clever cartoonist, that moulder of public opinion, as the booted bad man with chaps and guns, but the kindlier pen would picture a civilization equal to the best, with all the frontier cruelties and hardships forever gone.

New Mexico should be given credit for erecting the first church in America and it was on her soil that the first permanent settlement of white men was established. Our history has been a struggle for political rights which now are ours to enjoy with the sister states of our grand republic.

With national resources developed and a knowledge of our matchless climate, we are sure to be one of the wealthiest, most independent and generally prosperous of the sisterhood of states.

For some reason, as yet unexplained by science, rainfall in the North and East has been gradually lessening for the past decade, and farmers, who for years have harvested abundant crops, have been forced, against their will, perhaps, to agree with a statement recently made by the Review of Reviews that shrewd, hard-headed farmers are turning their attention to western farms. Naturally they want to improve water as well as land conditions. In other words, they want to be their own rain-makers. In order to do this they must come to the states where irrigation is practiced.

Government projects and the Reclamation Service appeal very naturally to people and it is not my purpose to dissuade any one thus inclined from making full and exhaustive examination into any and all projects now in operation or to be hereafter promulgated by our generous Uncle Sam.

It is well, however, that all people should know that it takes real money and lots of it for one to succeed on any reclamation project where the initial cost runs into millions. Men with money, brains and energy will succeed on these projects, even though the cost of obtaining title to the land ranges from \$45.00 to \$70.00 per acre, with a perpetual tax for maintenance of community ditches added.

Intelligent farmers are coming to the irrigation idea as the only reliable get-rich-quick scheme without a penalty attached. With the "Back-to-the-soil" movement there comes a land-hunger and water-thirst that can only be supplied by states like New Mexico. People who have never traveled the length and breadth of this mighty Southern Empire can scarcely realize that we have 4,000,000 acres of land under our beautiful turquoise sky with an available water supply, as specified by surveyors, and for which applications to the Territorial Engineer have been made with but 750,000 acres now irrigated, according to Engineer Miller's report. This estimate includes the largest irrigation project in the world, now being constructed at Elephant Butte, down to the smallest valley consisting of only a few thousand acres.

The peopling of this grand domain, where health, opportunity and opulence await the man who says: "I Will," is going forward with rapid, irresistible strides and the true American spirit. The best civilization of our country is joining the forces of nature in building a commonwealth that will be the peer of any in the Union, and with climatic conditions surpassing them all.

New Mexico has successfully practiced irrigation since the latter part of the sixteenth century, so that we claim nothing new except improvement in method.

Aside from the area that has and can be reclaimed by harness-

ing our rivers and streams, we have nearly a half million acres of the richest soil in America, that is, or may be successfully irrigated by underground waters pumped from shallow depth, thirty-five to one hundred feet. Of this vast area, not over five per cent has been put under cultivation, but that five per cent has demonstrated to the world the absolute guarantee of wealth vouchsafed to the man who pins his faith upon the magic of the pump, has the cash or credit to buy the pump and applies himself with energy and intelligence. In every county of the new state there are areas that are being or may be reclaimed at enormous profit by the now proven system of pumping for irrigation.

At Roswell, in the great Pecos Valley, hundreds of artesian wells tap the underground waters, and many pumps are also in use, there have been shipped this year over 8,000 carloads of the finest orchard and field products in the world, worth not less than \$3,000,000, to say nothing of trainloads of live stock, wool and cotton. This is relatively true of the whole of the great Pecos Valley, whose 1911 alfalfa product alone is worth almost a million dollars.

A single pumping proposition near Roswell includes 13,000 acres, with twenty-eight miles of electric transmission lines connecting the motor-driven pumps. The residents of this beautiful city say that apple orchards in that vicinity are cheaper now at \$1,000 an acre than they will ever be again.

The Portales region can boast the largest central irrigation power plant in the United States, where farmers are pumping on the co-operative basis, the original cost being \$35.00 per acre, but the cost of maintenance has thus far been but \$1.50 per acre. The longest transmission line does not exceed eighteen miles, and the acreage that will eventually be reclaimed will exceed 150,000. Everything, except citrus fruits, is grown in great abundance and a fine beet-sugar factory will soon add value to the area. It might be added right here that New Mexico sugar beets, like her fair women, are the sweetest in the world.

The Estancia Valley is doing wonders around Willard and Estancia, through the magic of the pump, where the cost of an acre-foot of water is about \$1.75. Their products this year show 1200 pounds of beans per acre, 200 bushels of potatoes, with other crops in proportion; and truck farming producing \$300.00 per acre or better, which latter fact applies to all our valleys.

At Alamogordo, the pump is also becoming a great factor in profitable farm development.

The Albuquerque region, and in fact the whole Rio Grande Valley, is taking on an era of prosperity through the instrumentality of water, pumped from the earth, to give necessary moisture for plant growth. There are a number of small irrigation wells in the vicinity of Fort Bayard, the largest army sanatorium in the United States, if not in the world. Speaking of sanatoriums, it may be truthfully stated that New Mexico is one great sanatorium, where health makes wealth easier and where Nature has been most lavish in her gifts to men.

Assuming that our largest daily newspaper, the Albuquerque Journal, spoke intelligently when it said, "The Mimbres Valley is showing the world when it comes to pumping for irrigation," the attention of the Congress is directed to what is actually being done in this most forward region.

The Mimbres Valley is located in the southwestern part of the state and lies largely in Luna county. It is surrounded on every side by mountain ranges which effectually protect it from severe storms, an approach to a cyclone never having been known. Its level area is well described in a recently published report of Hon. Charles D. Miller, Territorial Engineer, which says:

"Estimates of the possibilities of this valley place the figures of irrigable area from wells producing from 500 to 1200 and even 1500 gallons of water per minute at 100,000 acres. To this area it is conservatively estimated that there may be added 100,000 acres irrigated from wells producing 500 gallons down to possibly 200 gallons of water per minute."

The valley has an underground basin filled with water filtered for many miles through sand and gravel, rendering it the purest body of water in America. The Government analysis last year of the water used by the Deming City water-works, which is a part of this underground flow, gave 30 parts total solids, chiefly magnesia and iron, to 100,000 parts of water. Without chemical treatment of any kind this water is used for every purpose, scientific or domestic, and is applied direct from the pump with absolute safety to every form of plant life, which means everything in the vegetable kingdom, outside of citrus fruits. Its quantity may be most easily and quickly understood when we say the report of a government engineer in charge of irrigation investigations, this year, said: "If 300,000 acre-feet were withdrawn from the underflow in one year, a condition almost impossible, it would lower the water plane below but 3.5 inches."

From this underground sea more than 200 pumps, ranging in volume from 200 to 2000 gallons per minute, are truly making the desert blossom as the rose.

The land-hungry of the north and east pay real money to come to this Congress to learn what is being done in the irrigated sections of the country. They want to know how much it costs and what are the profits. They don't want hot air theories; they want ice cold facts based on actual experience.

Using the Mimbres Valley as a leading exponent of pumping for irrigation, we submit the following facts: Relinquishments from present holders of land may be obtained for from \$5.00 to \$25.00 per acre. Unimproved deeded land may be purchased for from \$15.00 to \$100.00 per acre, the price being regulated to a certain extent by the distance from Deming, the chief market town of the valley, and chief railroad center of New Mexico. Tracts of five to twenty acres, improved with water developed, may be purchased, close in, at \$125.00 to \$150.00 per acre.

Cost of wells and pumps: A well, pump and 35 H. P. electric motor, sufficient to successfully irrigate 150 to 200 acres, costs \$2300 to \$2600. The same well costs from \$400 to \$600 more, a crude oil engine being slightly more expensive, which is overcome by a cheaper operating expense.

Cost of putting water on the ground: Getting right down to brass tacks, in order that a child may understand and computing the cost of 100 or more large and small successful pumping plants, it costs a half-cent to pump 1000 gallons of water, a season's irrigation costing from \$3.00 to \$9.00 per acre, according to the amount of water required for various crops and the skill of the irrigator. These figures are based on electricity at 3 cents per K. W., engine naphtha at 12 cents and crude oil at 6 cents per gallon, and with the increasing consumption all of these products are getting cheaper.

Plowing and irrigation are carried on every week in the year, and in most of the market gardens, vegetables are grown the year 'round. Winter irrigation for spring and summer crops is gaining in favor.

What are the profits? Of course that interests everybody most. Based on the actual experience of our farmers during the past two years, we can say: Alfalfa, \$50 to \$70 net profit per acre; pink beans, \$30 to \$60; white onions, \$250 to \$325; cabbages, \$350 to \$450; tomatoes, \$400 to \$500; potatoes, \$200 to \$300; Kaffir corn and Milo maize, \$30 to \$75; watermelons and cantaloupes, \$250 to \$275; garden

truck, including celery, chili, rhubarb, asparagus, \$300 to \$1,000 per acre.

Every kind of fruit, except citrus varieties, grow in great abundance. The Mimbres Valley captured the first prize for the world's largest apple at the St. Louis World's Fair, the big fellow weighing 48 ounces and measuring 22 inches in circumference, and it is interesting to note that 100 trees in this same orchard this year produced 100 tons of choicest fruit. It is a significant fact that New Mexico apples, made to blush in beauty by our wonderful sunshine, command the highest market prices in the world.

Peaches, pears, plums, grapes, nectarines and all deciduous fruits are grown at tremendous profit.

The opinion of others who have made extensive investigations in this region may be of interest:

Postmaster-General Hitchcock says: "You have a marvelous development and bright future," which statement is verified by former Secretary James R. Garfield. Alfred Henry Lewis writes the speaker as follows: "You have a right to be enthusiastic over your wonderful country. It's great. It's majestic. It's marvelous. It is a story that interests the human family and the intelligent American citizenship that is fast peopling this region will make it an abiding place much to be desired."

Governor Folk, western presidential timber, says, "It is one of the most favored parts of our Union."

Lee A. Phillips, the largest individual farmer of California, and chief of the loan department of the Pacific Mutual Life Insurance Company, is an ardent advocate of pumping for irrigation, as his experience proves that one or two more crops are possible under this system and ditches do not carry noxious weeds or seeds from one farm to another. As proof of his faith in the magic of the pump, he has very extensive loans in the Mimbres Valley and other irrigated valleys of New Mexico, preferring to make loans on lands irrigated by the pumping system to land irrigated by any other method.

One of the great newspapers of Chicago says: "Herein stretches the Egypt of the New World. There is the same clear, luminous atmosphere overhead and the same delicious climate."

A great agricultural journal of the Southwest says: "The water and climate in this valley are so nearly ideal it is a waste of time talking about either," so I am going to quit, right now, but I wouldn't exemplify the spirit and hospitality of the Great Southwest if I did not extend to each and every officer and member of the great Congress a cordial invitation to come and visit us in the Land of Sunshine, magnificent schools, and educational advantages, where health makes wealth easier and renders life a positive blessing.

I want to voice the sentiment expressed by the other representatives of the Southwest in this reclamation movement. We are with you tooth and nail, body and soul. We want this whole country to prosper. New Mexico has not much to ask of the government except in conducting properly the reclamation enterprise we are on now. We have four million acres of land to be reclaimed and that is being now reclaimed. We are erecting dams and expected to have the question of the Elephant Butte Dam touched upon by our chosen speaker, who unfortunately was absent this morning, explaining the great project to other people and could not be present in this hall.

We are with you now as a state of the Union. We are preparing to be one of the United States, and when you come to see your baby sister we will all give you the glad hand and welcome you and when we shall have completed in reclamation what we are doing in our state we can take care of two millions of people. Just think of that. And you are all welcome. We are glad to extend the hand of fellowship to every man, woman and child who wants to seek a land of sun-

shine, a land of opportunity, a land of opulence, and one of the garden spots of this whole United States. Thank you, gentlemen and ladies. (Applause.)

PRESIDENT FOWLER: I had a mind to go to the paradise of South Dakota, but since then my views have been changed and if I did not live in Arizona now I should move over into New Mexico.

MR. HOLT: Thank you, sir.

JUDGE JOHN FAIRWEATHER, of California: I would just like to ask my friend Willard if that is a sworn statement about the hundred tons of fruit from one hundred trees?

MR. HOLT: It came from an orchard of my neighbor, Judge, and I never have found it necessary to doubt his word. Those apples were as large as that. (Indicating.)

MR. H. A. PARSONS, of New Mexico: I just want to say to the gentleman in regard to the sworn statement, I would just like to hand him this on the apple proposition. (Handing a paper to Judge Fairweather.)

MR. HOLT: I told you New Mexico stands together.

PRESIDENT FOWLER: The next paper on the program will be on the subject of "The Roosevelt Dam," by Hon. Dwight B. Heard, of Arizona. Ladies and gentlemen, Mr. Heard, of Arizona.

Address by

Dwight B. Heard
of Arizona

THE ROOSEVELT DAM

Mr. President, Gentlemen and Ladies: I was very much interested this morning in the talks of representatives from the various states. If there is anything that the western man particularly stands for it is intense loyalty to his own community where he lives. I was much interested in what our friend from South Dakota said, and I merely want to say this to you, that after the close of this Congress if you will all get on a train and go out to Arizona, you will find that you are not a half-mile from paradise, as he suggests, but you are there.

Now, in selecting the Roosevelt Dam for my subject I have felt, for the reason that the dam was completed and that the project was 96 per cent completed, that we have there an object lesson which will show you what the Reclamation Act has done and that we could show you how essentially it represents a home-making movement.

Now, what I say of our community, I do not say in any boastful spirit, but merely to indicate to you the tremendous development that becomes possible under this Reclamation Act.

As every traveler who visits the Grand Canyon of Arizona admits that in this stupendous chasm with its incomparable coloring, and chaotic grandeur, he has seen the great natural wonder of the world, so does the same traveler admit when from the marvelous mountain roadway which skirts the Canyon of the Salt River, he looks down upon the great Roosevelt Dam, that here is the greatest creative engineering triumph of man. It would certainly seem as if here the Creator had planned a natural opportunity waiting only for the invincible spirit of the West to undertake the great task of damming the mountain gorge and thus creating a vast treasure house for the storage of the life-giving waters, so valuable and so necessary to the

thirsty but remarkable rich lands of the great Salt River Valley, whereas in the other valleys of the arid West water is life and land without water but a Col. Sellers dream.

Forty years ago General Crook, dubbed by the Apaches "The Grey Fox," chased those red men through the almost impassable country surrounding the Roosevelt dam, broke their warlike spirit and, with the co-operation of the fearless pioneers of the Territory, gave for all time peace and security to the people of Arizona. During the construction of these great storage works the descendants of these same Apaches were employed in large numbers, furnishing a very desirable and serviceable class of labor, a most interesting object lesson of the evolution of the native American.

Opportunity and the spirit of the West is an inspiring theme, and the union of opportunity and this indomitable spirit of the West resulted in the construction of the Roosevelt dam. Twelve years ago we of the Salt River Valley realized the fact that we had reached the limit of our development without the storage of the flood waters at this natural site, and organized work was commenced to bring about the construction of the dam.

I happened to be one of the commissioners in charge of this preliminary work and we endeavored to handle the job in a systematic and organized manner. The exact records of water flow were gathered, stream measurements were maintained and with the splendid co-operation of Arthur P. Davis, then of the Bureau of Hydrography of the government, now Chief Engineer of the Reclamation Service, a complete survey was made by the government, diamond drill borings were carried on to ascertain foundation conditions, cement materials were located, analyzed and tested, and when on June 17, 1902, the great Reclamation Act, admittedly second only in importance to the Homestead Act, was passed by Congress we were ready for the new era of opportunity and development.

Fortunately the immense water shed tributary to the Roosevelt dam of over six thousand square miles all lies within the limits of national forests or Indian reservations. The increase and perpetuation of the grasses and undergrowth in this section, under the efficient administration of the Forestry Service, forms a natural regulator of the runoff into the reservoir and serves as a splendid example of the practical value of the intelligent conservation of natural resources.

The preparatory work done on our project and its immense natural advantages won for it the favor of the government and it was the first large project undertaken by the Reclamation Service, who carried on the work in the face of innumerable obstacles with unflinching energy and great success until on the 18th of last March the work was completed and Theodore Roosevelt, who had put his strenuous personality behind the passage of the Reclamation Act, dedicated the dam which bore his name to the use of this and future generations in the Salt River Valley. In his address he said: "I wish to congratulate you on the extraordinary progress I have seen here. I consider the drive from the beautiful city of Phoenix to this spot (the Roosevelt Dam) one of the spectacles best worth seeing in the world. I firmly believe that as soon as the East becomes better educated that this will be one of the places to which visitors will come from all parts of the country. The Reclamation Act, like the Homestead law, is a law for the small man—it is a law for the twenty-acre farmer—a law for the man who farms his own land. I want to congratulate you on the public spirit you are showing in this valley, and the way you are working together. The problem of our future is in the keeping of that magnificent spirit of initiative that has made the pioneer people successful in the past, and joining to it the ability to use the collective power of the people to the achievements of a common purpose."

Now as to a few necessary statistics as to this great structure and the results which have been brought about by its construction. A great English writer has said "Lies, damn lies, and statistics." I am going to avoid this analysis by calling my statement facts.

This dam is 284 feet high, over 1000 feet long, contains 334,000 yards of solid masonry, and in its construction nearly 300,000 barrels of cement were used, all except the first few thousand barrels being made by the government cement plant at the site at a cost of less than half of what commercial cement could have been laid down for.

The great reservoir constructed by this dam is the largest in existence and has a capacity of 1,284,200 acre-feet, or enough water to cover the irrigation district of the Salt River Valley of a quarter million acres, five feet deep. This huge artificial lake surrounded as it is by rugged mountains is not only of incomparable usefulness but very beautiful.

As an auxiliary to the dam, a power canal nineteen miles long has been built and drops the water 190 feet through a tunnel out in the solid rock to turbines where 8,000 horse power is generated and carried over a wonderfully constructed and most substantial transmission line to the Salt River Valley, sixty miles away, where the very valuable power is used as follows: First, for pumping to the surface and using for irrigation, the vast underground supply of water in the Salt River Valley; second, for domestic use and the development of the industries of the valley, and the sale of the surplus power remaining to those mining interests desiring power outside of the reservoir district, from which sale of surplus power a large revenue will be ultimately derived, thus reducing the obligations to the government of the lands within the reservoir district.

The settler in coming to our valley to-day finds that the government has paved the way for his success in a most remarkable manner, not only through the assurance of abundant water from the government works, but by the efficient study of natural and agricultural conditions carried on by the great departments of Agriculture and of the Interior. A complete contour map has been made and every settler can tell how best to irrigate his 40 acre tract, a detailed soil survey and analysis has been prepared that the settler may know the exact quality of his soil; the local Experiment Station will advise him how to handle his soil, and what will grow upon it to best advantage, even the domestic water throughout the valley has been analyzed so the settler knows into what strata of gravel to sink his well to get the best domestic supply.

A few years ago, with the hopeful spirit of the West, we used to talk of when the dam would be built, and what might then be done; to-day, thanks to the accomplishment of this great work by the Reclamation Service, we are able to tell you what is done, and of the results that are now being accomplished. All of this accomplishment is, I believe, largely due to that indomitable spirit of the West which stands for energy and resourcefulness, courage and progress; equal opportunity, never quits and is always imbued by a fine sense of public spirit.

As the work of building the great dam progressed it became evident that the government should also own the system of canals, and after more or less strenuous negotiations these canals were finally purchased for what they were actually worth, many of them have since been enlarged to double their capacity and enlargement is still going forward.

It also became evident as the work progressed, that a substantial diversion dam was a very necessary adjunct to the reservoir, located just at the opening of the Salt River Valley, for diversion of the natural flow of the Salt and Verde Rivers and such water as might be added from the reservoir. This need resulted in the building by

the government of the great Granite Reef diversion dam of concrete steel, the largest structure of its type in the world, and stretching across the river from natural granite abutments 1100 feet and controlling to a nicety the distribution of the irrigation water through huge head gates into the canal systems on both sides of the river, which serve the 250,000 acres under the project. This diversion dam replaces seven temporary dams scattered along the river which once served the Salt River Valley, at an operating and maintenance cost of less than 10% of that of the seven old structures.

As water was carried to the valley in these great government canals the various natural falls in the system were utilized and the saved water was again made to work in developing electrical energy and 8,000 more constant horse power was added for a total additional investment of \$900,000, which money is being raised in cash by the people of Salt River Valley in order not to drain too heavily upon the national irrigation fund; and also demonstrating a public spirit and willingness to help themselves, which is typical of the people of the West.

Now that it is known that with the construction of the reservoir an assured water supply is available for the lands of the Salt River Valley, delivered to the water user scientifically and economically as needed in the irrigation of his crops, people from all sections of the country are steadily coming into our favored land. Hundreds of attractive homes of the homesteader give practical illustration of the success from a home-making standpoint, of the Reclamation Act, and the steady segregation of the larger holdings into small farm units is constantly increasing the population of our community.

Our great range of agricultural products had been proven before the construction of the reservoir and the 47 agricultural industries which flourish in the Salt River Valley make it one of the greatest object lessons in the world of diversified and intensive farming. Our best product, however, is as fine, vigorous and wide-awake a bunch of youngsters as can be found on God's green earth.

We have learned to practice the great principles of soil conservation involving crop rotation, fertilization through leguminous crops and intensive cultivation. With these methods used upon a soil which in natural richness rivals that of the Valley of the Nile, we know that with intelligent management and the abundant water supply now assured, our crop production per acre will greatly increase, and our community support, in comfort and plenty, many times its present population.

Since the reservoir water was assured, tens of thousands of acres of desert land have been cleared, thousands of miles of substantial fencing have been constructed, and hundreds of new homes dot the valley, which are merely indications of thousands yet to be built.

With this development of the home-making movement, other community development became necessary, such as more schools, better roads, more churches, and other community improvements. These all mean demands upon the settler for expenditure, involving first his duty to his family for its support, second his expenses in home building, clearing his land and bringing it into cultivation; and third his share of the necessary community improvements. In view of all these expenditures by the settler, all of which naturally increase the security of the community, it is very evident that a longer period of time than the ten years specified in the Reclamation Act, should be given this and all other Reclamation Districts to pay back to the government the money which has been so wisely advanced to assist in the development of these western communities, and which has resulted in creating tens of thousands of new homes of inestimable value to the nation.

The people of the arid West want to pay back honorably to the

government every dollar which has been expended for their benefit. They have not the slightest desire to even suggest repudiation of this debt, but they do ask, and with justice that in view of the necessary expenses of home-making, land improvement and community development, the term of these payments be reasonably extended.

The Reclamation Act now provides that no water from government works shall be furnished to lands owned by non-residents. Where non-residents are prepared to improve and cultivate their land they are undoubtedly a benefit to the community. This is evidenced in southern California, where much excellent development has been done by non-residents, and in my judgment, the Reclamation Act in this respect should also be amended to provide that when any project is 60 per cent complete, the limitation preventing non-resident ownership shall be modified to the extent that when such non-resident land owners maintain their land in cultivation and conform to the limit of acreage for the project, they shall be entitled to the full benefits of such project.

To give you some idea of the fixed and permanently improved conditions which have been created under the Salt River Project, I want to call your attention to the fact that when we commenced to build the Roosevelt Dam the assessed valuation of our county was but \$10,237,795, while its present assessed valuation is \$21,947,000, an increase of over 110 per cent. When we began to build the Roosevelt Dam the population of the City of Phoenix was eight thousand; to-day it is nearly twenty. Our school population is increasing at the rate of 15 per cent per year; last year in the City of Phoenix, 690 new and substantial homes were constructed. When we began to build the Roosevelt Dam, two lines of railway reached Phoenix with four trains a day; to-day five lines reach that city with eleven trains per day, and over 125 miles of new railways have been built within our county in the past four years. In the same period, we have constructed forty-eight miles of cement sidewalks in the City of Phoenix, without one cent of bonded indebtedness, and now in the center of our city are building a mile of permanent pavement identical with that on Michigan Avenue in the City of Chicago. In the past three years our bank deposits in Phoenix, the center of the irrigation district, have increased from \$2,609,816 to \$5,365,455. In the last two years, business and public buildings have been completed within the City of Phoenix costing over \$966,000, and there are to-day under construction or contract within our city business blocks and public buildings costing \$444,000, and in addition to this investment in public buildings, there are to-day under actual construction in the City of Phoenix 150 new homes.

Many new industries are springing up throughout the valley or are under consideration. The dairy industry, one of the best thermometers of the prosperity of any community, is on an especially thriving basis. 13,000 cows are now being milked in the reservoir district. Milk brings \$1.32 per hundred pounds; all our creameries are prospering and extending their plants.

Our rapidly increasing school population has greatly exceeded our supply of school buildings, and to meet this need, over \$525,000 has been expended in school buildings and equipment during the past two years within the reservoir district, including three modern and well equipped high schools. The need for better and more modernly constructed roads has been met, and during the same period we have expended over \$271,000 on good roads and bridges, including the construction of the Center Street bridge of concrete steel connecting the two sides of the Salt River Valley, and the longest structure of its type in the world. All these improvements for roads and bridges have been accomplished without one dollar of bonded indebtedness, and we have just begun the good roads movement.

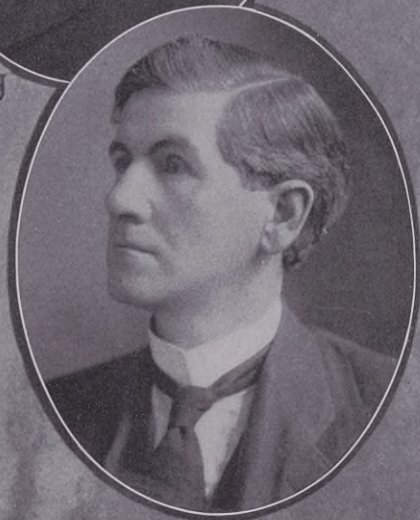
These statements are not made at random, but are an exact state-



Dr. E. McQueen Gray
Foreign Secretary
19th. and 20th.
Congresses



Maj. Richard W. Young
Chairman Executive
Committee
20th. Congress



August Wolf
Director of
Publicity,
19th. Congress

ment of facts, the result of careful investigation; and merely illustrate the tremendous home-making movement that has been made possible by the construction by the government of this huge reservoir, which is a guarantee for all time of the permanent prosperity of the Salt River Valley community.

They also illustrate the great financial demands upon the new settler to meet his proportion of these individual and community improvements, and present a strong and logical reason for an extension by Congress of the time period within which the cost of the Reclamation works shall be repaid to the Reclamation Fund.

In considering such an extension of time Congress will undoubtedly give due weight to the fact that every dollar used by the government under the provisions of the Reclamation Act was obtained from the sale of public lands within these sixteen arid or semi-arid states in which the Reclamation works are being constructed.

Great economic thinkers and students of public affairs agree that any nation's virility, prosperity and growth are best assured when the larger portion of its people live in the country. During recent years there has, unfortunately, been a tendency on the part of the people of this nation to drift to the cities. President Taft at the Conservation Congress in Kansas City last October, stated: "One of the great reasons for discouragement felt by many who have written on this subject is found in the movement of the population from farm to city. This has reached such a point that the urban population is 46 per cent of the total, while the rural population is but 54 per cent, counting as urban all who live in cities exceeding 2,500 inhabitants."

Recent statistics show us that while the population of the United States increased 21 per cent in the past ten years, the total acreage of farms increased but 4 per cent. These are significant facts and thoughtful citizens naturally look for means of betterment. The development through irrigation of the arid West strongly offsets this movement towards the cities, steadily increases the number of rural homes—one of the nation's greatest assets—and justifies the support of all clear-headed and patriotic citizens.

In closing my remarks on the Roosevelt Dam and its results, I must not forget what is probably the most important result of this great reclamation work for the people of Arizona. For nearly forty years our people have worked for independent statehood, with a courage, loyalty and devotion which I believe is unexampled in the political history of this country, and without the assurance of this great reclamation work, and the home-making movement which has resulted from it, this privilege of statehood which we are so soon to receive, would probably have been long delayed; and when early in the new year the star of Arizona is added to the flag of this nation, our people will realize that they have at last come into the heritage for which they have so long been waiting, and to which, now that Arizona's future prosperity is assured, they are so justly entitled. (Applause.)

PRESIDENT FOWLER: As my mind begins to clear up, Paradise is near Arizona. Now, while making some announcements, I would like to ask our friend, Mr. Holt, of Deming, New Mexico, if he would like the opportunity to enlighten some of the people here by passing around some of the excellent printed matter that he referred to. I have no doubt that we would be glad to have him do so.

MR. WILLARD E. HOLT, of New Mexico: At the beginning of my address, a page came in and said "A package has been left for you." On opening the package I found the latest issue of "Earth." I find New Mexico is spoken of very pleasantly here, because she is next to be admitted to the Union. The next issue of "Earth" will probably be devoted to our sister state, Arizona, and then the world

will know that we have absolutely a charter right to be the paradise of the world. Anyone desiring a copy of this issue can call at the seat of the undersigned. I thank you. (Laughter.)

PRESIDENT FOWLER: At the conclusion of the meeting this afternoon, there will be a conference in the Auditorium on the subject of "Drainage," with regard to some organization, I suppose. I was requested to make this announcement.

The next address will be that of the Hon. Niel Nielsen, M. P., Commissioner for Trade and Irrigation to the United States and Canada, representing the government of New South Wales, Australia, who was presented to the Congress this morning. He had then just arrived in the city and arranged for this opportunity to present to you some facts regarding the unknown country, almost, to us, New South Wales. (Applause.)

Address by

Hon. Niel Nielsen

of New South Wales, Australia,

Commissioner for Trade and Irrigation to the United States
and Canada

Mr. President, Ladies and Gentlemen: Taking into consideration the fact that I have traveled about 10,000 miles on land and sea to be present at a sitting of your Congress, I need hardly say that I am glad to be here, to have arrived at the end of my journey, and while I am here I will be very glad if the people attending this Congress will give me a small amount of time while I tell them something about the land that I come from—as the Chairman calls it, "The unknown country of Australia."

I have found since I have been in the United States of America, only a couple of weeks now, that my country is to a large extent unknown. I have found that at any rate there is very little real knowledge of what that country is, and what it is likely to be in the future in the progress of nations, and I think, if you will allow me to give you a few facts, that I will dispel, as far as this audience is concerned, the fact that that is an unknown country. I believe, as everyone should believe about the land that he belongs to, that my country is one of the best on the face of God's earth. I hope to be able, before I conclude this afternoon, to prove that, to some members, at any rate, in this audience.

I am not going to say anything in the nature of boasting about the State of New South Wales, Australia, but as the last speaker has said to you, I will give you some facts, and I will give you these facts from the governmental institutions of our country, and those facts are absolutely reliable. I have come here, not to teach the people of America anything in regard to this question of irrigation, but I have come here to learn from those who made the arid states of America what they are to-day, something of what we will be able to do with the arid part of the country that I come from. I am here to learn, not to teach, but I think I can teach you something, and that is, what my country is and what it is really worth in the progress of nations.

Australia is a long way from America, in the southern ocean. I had to travel 7,500 miles of sea before I saw the land of America. I traveled from there over here to attend this Congress, and I came here to tell you what four million of people have done in that great southland of Australia. Australia is bigger than the United States of America. That is a surprise to most people that I tell it to. We have more square miles of country in the island continent of Australia than you

have within the four corners of the United States of America. I am not going to compare the countries in any other way. Perhaps you would say: "There is no comparison," but as far as we are concerned, we don't wish to compare with America, except in our intention to emulate the progress that you have made since you have occupied this country. (Applause.)

We in Australia come from the same race as you in America. We all look back to the Anglo-Saxon and Anglo-Celtic blood that flows through the veins of our people, and if we can not call you brothers in America, at any rate we in Australia always think of you as "Uncle Sam." (Applause.) Now I would like to tell you some of the things that the four million people of Australia have done down in their own country. They have developed a trade which is greater than the trade of any other country with the same population. We in Australia to-day have a trade, a foreign trade with the other nations of the world, equal to one thousand million dollars of your money.

The whole trade of the United States of America, with your eighty or ninety million people, runs into—and I take the figures from your own books—runs into three thousand four hundred and twenty-seven million dollars. That is a great trade of a great country, but I say, when you compare that trade of this great country, with the thousand million dollars of trade of a country with four million people, you will give us credit for having done something down south in the country that I come from. (Applause.)

When I got to San Francisco I got in touch with some business people there and I surprised some of those business people by telling them about this trade of Australia. Some of them had almost not heard of it before; some of them thought it was a lonesome country down in the other end of the Pacific, where curiosities grow. They knew about the kangaroo and the various curiosities that we have there, but they told me that they didn't know that they grew such live men as the one that the Australian government sent over in your representative here to-day. (Applause.) When I was able to tell them that the trade of one port, the port of Sydney, where I belong, the trade of one port in Australia, New South Wales, my state, is greater than the whole trade of the Pacific coast of America, they wanted me to show facts and figures for it, and I did it, and I was able to convince them right up to the hilt. (Applause.) And I hope you will not mind my making that quotation to prove that my country has done something anyhow of some value for the rest of the world.

The trade of the whole Pacific coast of America is \$176,000,000. The trade of one port in Australia, Sydney, is \$297,500,000. That shows that we have done something in the way of trade, if we have not done much in the way of agriculture.

We want to make our agricultural production as good as our trade production has been in the past. We not only want to be a great state as far as commerce is concerned, but we want to be a great state as far as agricultural production is concerned, and that is one of the reasons that I am here to-day to meet the people who have made the arid states of America what they are; to meet the people in America who, by their business capacity, their energy and pluck, have made this country what it is, right through, from one side of the Union to the other, and I hope that you people will convey to me as freely as you possibly can all the information that you can about this great country of yours.

The number of ships that come into the port of Sydney every year from foreign ports, is over 3,000; less than 1,000 come into San Francisco; and the tonnage of those ships is 6,299,000 tons, against the tonnage of the foreign ships coming into San Francisco of 1,869,000. I only give you those few facts about Australia, and about my state in particular, to show you that we are not such a God-forgotten place as

many people in America have in the past imagined. (Applause.) We are a very live state. The latitude of Australia is between 11 and 39 south. We get to within 11 degrees of the equator and go down to latitude 39. The latitude of my state is from 29 south to 37. My state contains an area of 310 square miles, 198,000,000 acres, and we have a population in that state of 1,600,000 people. Now, we must admit that our country is not populated as well as it should be, but I am not here with the idea of taking population from America to Australia, unless you want to go there yourselves. I feel quite sure that if you went down there on a holiday trip, there are two chances to one that you might not come back, but we will leave that as it is.

What I have come to America for is to meet the people who have made America great, and to ask you to spare us a few of your expert irrigationists, so that we can take them to Australia to show the people how to do this work in the sunny south.

The State of New South Wales is of peculiar configuration. It is something like the United States of America on a small scale. But they don't need much irrigation there. God Almighty has attended to that for them. We have certain parts of New South Wales where we have a rainfall as low as 8 inches a year, and it is in the arid parts of the state where we are going to settle the big population of Australia. Upon a certain occasion I asked a man there: "How much rainfall have you had this year?" "Well, we had three yards and a half." I had never heard of rain by yards before, because I came from a part of the state where we had about 24 inches. I asked him what these three and a half yards meant, but I found when I figured it in inches that it amounted to 126 inches a year. Well, they don't want much irrigation there. I believe that the part of the country that will carry the greatest population in the future is the arid portion, when we apply water to that arid soil.

In our state we produce all sorts of things. In climate we have a semi-tropical climate, down to a climate that is fairly cold, and when I say "fairly cold," I don't want to lead you to believe that we have much snow in a country that does not go beyond the 37th parallel. Thousands of people in my state have never seen snow, and I myself had never seen a running stream of water frozen until I came to the United States. I have lived in Australia most of my life. I am not a native, although I am just as good as one, I believe. (Applause.) As a matter of fact the only parts of the country where there is snow are the mountains of New South Wales, but we never think of growing anything in the snow.

Most of our western country is something similar to southern California and Arizona, and when I came through that country on the train the other day, it made me think of the great people there must be living in this country to have gone out in the first instance into that country and made that country what it is at the present moment.

When I see the state of aridity that exists there, when water is not applied to the soil, I do marvel at the energy, the ability and the pluck of the pioneers who took up the land in those states in the first instance. (Applause.)

We are primarily a producing country. We have very few manufactures, and a great number of our exports are in connection with primary products. In my state there are 48,000,000 Merino sheep, and last year we produced from those sheep 385,000,000 pounds of wool, and we sell that wool to the United States, to Germany, Belgium, and to every country that lives in an up-to-date fashion. Our wool has a reputation not only in Australia but all over the world, and there is one thing I would like to say to you while talking of wool. I am very glad to hear that a conference is sitting at Washington at the present moment to go into the question of the tariff on wool. In Australia we are most of us good protectionists, but we don't believe in putting

a tariff duty on an article that we produce as well as some other country can produce it, and the proof of that lies in the fact that your buyers go all the way to Sydney, my town, and buy their wool.

We don't do much in agriculture. The total production of my state is \$52,500,000 in agriculture. In mining we do \$42,000,000 a year, produce \$42,000,000 of minerals. In dairying, we produce £19,000,000 worth of produce a year, and New South Wales is becoming a great dairying state. We are at the present time sending to the Old World, principally England, 76,500,000 pounds of butter alone, and we would like to sell some of it to you people here, and we will sell it to you cheaper than you can produce it locally. We would also like to sell you some of the 100,000,000 pounds of mutton that we send away annually. And in Australia mutton is only considered a by-product. We grow our sheep for the wool and sell our mutton just by the way, and I can buy the best mutton in the town of Sydney retail for 5 cents a pound, and you can't produce mutton in America for that.

Coming back to the matter of the irrigation project, I wish to say that we in New South Wales have seen the necessity for doing something with our arid country, and we have started a great irrigation project, not quite so great as the one about which our friend spoke a few moments ago, but one that, for a young country, can compare very favorably indeed with the great Roosevelt Dam that he spoke to you about. I would like to give you a few facts and figures about the dam we are putting in in the State of New South Wales. The dam itself is costing \$4,080,000. The wall is 240 feet high, 800 feet long on the top, 18 feet thick at the top, and 160 feet thick at the bottom, built of concrete. That dam when full of water will cover an average of 13,000 acres, and it will contain, roughly, about 800,000,000 acre-feet of water.

Now, we have made that dam so as to be sure that the people who go onto the irrigated land which we propose to open to our settlers will not be short of water when they go on.

Now, we have the Murrumbidgee River—and I noticed your President having trouble in pronouncing that in reading the letter from my friend from South Australia—and I am sorry that my friend, Mr. McIntosh, is not here to back me up in everything I say about the state I come from. We have the Murrumbidgee River with a flow of 2,000,000 acre-feet per year, and the whole of the flow from the canal, with the exception of the small proportion that is necessary to be kept to preserve the riparian rights of the people down the river, is going to be applied toward the irrigation project that we have on hand at the present time.

But in addition to that we have built this dam at the head portion of the river, so there will be no chance for a shortage of water in this great irrigation project of ours. We have gone further. We have decided that this irrigation project of ours is to be a state concern from start to finish.

I was very much pleased to hear when I came to America what had been done by the states and by the nation in connection with irrigation. I say that irrigation is a question that must essentially be taken up by the states and by the nation.

In New South Wales we have decided that this great project of ours is going to be a government concern from start to finish. The government has built the dam, the government has cut the channel, or, as you call them in this country, the ditches, the government has done the essential work on the Murrumbidgee River, and they have gone further, they have bought 1,344,000 acres of land from the present owners, so it will be a government project from the beginning to end. The whole thing cost in your money \$27,273,000.

When we saw it was necessary to supplement the dry farming methods of our state by applying water in a judicious way to the land,

we decided that we were going to do the thing properly, that we were going to benefit by the mistakes of other countries and other states, of our adjacent state, the State of Victoria. I believe you had Mr. McKenzie from that state last year. In fact, they saw the advantages of irrigation before that. But they made a mistake, and we are going to profit by their mistakes, and I will tell you frankly that I am going to get information so that we will be able to profit by the mistakes that you have made in America, as we do not want to make any mistake in New South Wales. Of this 350,000 acre project we are going to irrigate 344,000 acres.

The cost of that to the man that goes on the land will be from \$50 to \$100 per acre, but he is not going to be asked to buy it at all. What we found down there is that a man is very often crippled, completely crippled by having to find the money to buy the land that he occupies at a time when the soil is not producing much for him. What we have decided to do is this: We have decided to say to the man who goes on the land: "This is the valuation on the land, and as long as you like to stay on that land, we will give you a title of it, we will give you a title to it at the end of five years, and as long as you like to stay on that land we are not going to ask you to pay for it, and all we are going to ask you to do, is to give us 2½ per cent as rental on the unimproved capital value before you did a tap of work on the land."

Now, what about water? Since I have been in America I have heard the cost of applying water to the land in several instances, and I have come to the conclusion that we can do it as cheap down in Australia as you can do it here; because the cost of water on these lands that we are going to give the people for 2½ per cent on the valuation will be \$1.20 per acre-foot. That is 5 shillings in our money. I hear the bell. Am I to be restricted?

PRESIDENT FOWLER: Oh, no.

MR. NIELSEN: I just want a minute, because I want to finish my speech.

(Applause, and cries of "Go on, go on.")

MR. NIELSEN: You will pardon me for being so enthusiastic in stating the claims of my country before an appreciative audience.

A DELEGATE: We will listen to you all night.

MR. NIELSEN: We are going to sell the people water for \$1.20 per acre-foot, and when the man has paid his rent at 2½ per cent on the unimproved capital value of the land and he has paid his water rent at the rate fixed at the start, his payment then and there ends. That is, he pays that much each year and he knows when he goes onto the land that those are the only charges to be made. The government is going to maintain the dam and the ditch.

I don't know whether you have anything like that over here; from what I have heard, I do not think you have. The government have decided that they are going to get sufficient advantage from this great irrigation scheme by the settlement of thousands of people there, producing the fruits of the land in the way they should be produced; they are going to get sufficient returns from the ordinary taxation these people will pay as citizens of the state to repay for the initial cost of carrying out this great water scheme.

Not only this, but we intend, through the settlers, to build their houses and allow them ten years to pay for this work, with interest at 5 per cent. If they wish it, we will grade the land and charge them for it, payable in ten years; if they wish it, we will provide fencing material and fence their land and give them ten years to pay for it. We are doing that to encourage settlers to go on these arid lands.

When you consider the 50-acre tract, it seems a very small area indeed. Yet, we have fixed the unit at 50 acres from our observation in

other countries that know more about irrigation than we know. We have found that 50 acres of land in America yields sometimes the best production that takes place in these states. We find that a small unit in fruit growing is responsible for great production.

But we fix 50 acres as the limit, and beyond 50 acres we will not give the homesteader an interest in that land. But we make this proposition, that if he takes up 50 acres and irrigates the land, we will give him 150 acres alongside of it, that is, on the outskirts of this area. The land we have bought from the private owner, and if a man takes up 50 acres of irrigated land, he will get this in conjunction with it for feed for his stock.

We are giving that as an encouragement to people who will go to our country. We believe if you put a man on land you are bound to keep him there, not by making a stringent law or stringent conditions, but you must keep him there by self-interest alone, by making him able to earn not only a living upon the land but to earn a little better than a living upon it. (Great applause.)

I represent a farming community in the New South Wales parliament, and one of the reasons I have been able to represent that community for the past thirteen years continuously without any break, although I have stood for six elections, is, I have represented those people simply because I stand in my place on the floor of parliament and uphold the principles of giving the man on the land fair conditions under which to live. If he does the pioneering and producing work of the country, make his life as comfortable as it possibly can be made under the conditions under which he lives; make his life as nearly as possible like the life of the people living in the cities and large towns of Australia. (Applause.)

That is why I have been able to represent my State in Parliament for so many years.

The people whom I represent there know when I am telling this on the platform on election times that I am not ending it there, but that I will use my power and privilege on the floor of the House to do things for them that I promise on the public platform.

Now, in addition to what I have told you, the state is going to provide a butter factory, bacon-curing factory, fruit-canning factory, fruit-evaporating and canning, raisin-curing, grading and packing house, and cold storage for all perishable products.

PRESIDENT FOWLER: The gentleman's time has expired, but I am very sure that I voice the sentiment of the audience that his time be extended, and as the chair hears no objection to that, his time is extended.

MR. NIELSEN: I must, indeed, Mr. President, give you my thanks and also give the audience my thanks for extending my time, and I can assure you I will not weary you many minutes longer. But I want to finish my speech in the way that I had started, and give you as many facts as I can in the short time at my disposal.

Now, in regard to what this land will grow I have a few words to say, and I have with me the opinion of an expert, the opinion of a man whom you know and for whose opinion you have a high regard, and that is Mr. Elwood Mead, whom your country has been good enough to give to the State of Victoria.

I was Minister for Land of New South Wales when this project first came before our government, and I suggested to my colleagues that we should get Dr. Elwood Mead to come to our state and to make up a report as to what this country, if it were irrigated, was likely to produce. While I do not intend to weary this audience by giving you the whole of his report, which is necessarily lengthy, I wish to pick out one or two plums from that report so you will know what that gentleman, whom you know so well by reputation if not personally,

has to say of this great irrigation project of ours down in New South Wales.

He says this in regard to the land:

"I have gone over the entire area selected and am delighted with its character. It extends for 80 miles along the base of the sandstone hills, which form the northern boundary of the river's drainage. The surface soil has been deepened by the wash from the higher slopes and varies from a sandy to a clay loam. The whole of the area is suited to the easy and economical distribution of water and to the growth of a wide range of valuable crops. Its possibilities have been clearly and concisely described by Mr. Allen, fruit expert, of the State Department of Agriculture, in the following statement."

This is a quotation that Mr. Mead makes as fruit expert, and he therefore indorses Mr. Allen's paper.

"If such a scheme as this were carried out it would place those who took up this soil in a position to defy droughts, and with good crops of alfalfa assured, it would be possible to make pig-raising a very profitable industry. Raising early lambs for market could also be carried on with profit by small holders and, in my opinion, dairying would soon be taken up and would prove as lucrative an industry there as in almost any part of the state. Vegetable raising could also be carried on successfully, and I feel sure that potato growing, particularly for the early markets, would receive considerable attention; and as for fruit growing, it would be carried on under the most favorable conditions, as there can be found here large areas of soils particularly adapted for the raising of citrus fruits, as also grapes and stone fruits, and soils which are second to none of the very best to be found in Mildura, where, as is well known, some of the very best Australian dried fruits are produced."

"This statement of an expert shows that the agriculture and horticulture of this district will be widely diversified."

Then Mr. Mead goes on to speak of the water supply:

"The profits of irrigation depend largely on ability to apply moisture when needed. The water supply must be, therefore, ample. The Murrumbidgee scheme will meet this requirement. For the past ten years the average annual discharge of the river has been over 2,000,000 acre-feet. Of this, 300 cubic feet per second, or 229,000 acre-feet a year, has been reserved to supply existing rights or prospective needs on other parts of the stream. The remainder, amounting to about 1,750,000 acre-feet a year, has been dedicated, as far as is necessary, to this project. This will give 5 acre-feet of water for each irrigated acre, which is more than will be required. An average of 2 acre-feet of water per acre for the whole year, measured at the place of use, will more than meet all requirements. Three acre-feet of water per acre, or about 1,000,000 acre-feet of water a year, should meet the maximum requirements of this scheme, and this, with the storage facilities which are being provided, the river should supply."

"The Burrunjack Reservoir will be 41 miles long; it will cover 13,000 acres of land and hold 766,000 acre-feet of water. The outlets of the reservoir provide for a discharge of 3,000 cubic feet per second, which will more than meet the maximum requirements of irrigation. It will be ready for all emergency needs, and as it will hold enough water to cover the whole irrigated area to a depth of two feet, irrigators will be freed from all danger of drought."

Now, he said there that two acre-feet per year will be sufficient. Now, that will be sufficient, because this irrigation project has been carried out in a country that has a rainfall of from 12 to 16 inches per year, varying from 12 to 16 inches according to its distance west from the coast.

Another extract from Mr. Mead, and I am through:

"An experimental farm has been established on the land at Yanco,

and settlers can there see how fields and orchards should be graded, watered and cultivated.

"The foregoing outline of this project shows that settlers on this land should be able to grow a wide range of valuable crops. The next question to be determined is what demands will there be for these products. These irrigation areas will be the principal source of supply of a country half the size of the United States, for fruits and vegetables in all years, and hay and fodder in dry years."

The eastern side of Australia has the most of the population. My state has more than one-third of the population of the whole of the states of the Australian union. Consequently, you will see what Mr. Mead says is correct, that the eastern part of the country will depend on these irrigated areas for fruit and vegetables in all years and in times of drought and scarcity of water, for fodder as well.

So people who go into this project in New South Wales will have an ample scope, as far as their market is concerned. I quote Mr. Mead:

"The limited extent of the irrigated area and the immense extent of the dry area, which must depend on the irrigated country for many of its products, gives a great and growing local market, and the local prices already obtained are in keeping with its comparative freedom from competition.

"Owing to their location south of the equator they can send fruits and vegetables to the principal cities of the northern hemisphere at the time when there are no local products to compete. As a result, the fruit growers of Australia frequently obtain better prices, after paying freights, than do the fruit growers of Europe and America. Fresh grapes landed in Vancouver in mid-winter this year sold for £1 a case; pears brought 18/ a case; they brought even higher prices in London, the grapes selling for 1 pound 12 shillings a case; pears, for 19/ a case, and fresh plums brought 2 pounds 6 shillings a case."

These are not my words; they are the words of Mr. Elwood Mead, whom you all know, and I am sure whom you universally respect.

"The settlers under this scheme are also assured of freedom from water right controversies. This security of water titles is due to complete state control, both of the river and the works which divert it."

There is one thing we have in Australia that perhaps you have not in America. In Australia the state not only owns the land, but the state owns the whole of the rivers in the state. It owns the waters and the whole of the rivers in the state and all of the land on either side of the bank, so that no one's riparian rights can be interfered with. It was made so because of the mistakes of other countries, and when Dr. Elwood Mead went to Australia that was the first thing I spoke to him about, and he said: "That is the very best part of your irrigation project in Australia. You will not be troubled in regard to pre-existing rights because there are no pre-existing rights." I said: "That is one advantage we have in Australia that perhaps you can not boast of at home."

I say if you send us along a few of your experts to Australia to teach our people how to do the necessary work on these irrigated areas, those experts will find that they have very good material to work on in the Australian people, and they will also find that it is a country worth living in and fighting for living in and for white men, too.

One of the things that Australia is remarkable for is that we are making it a white man's country from end to end. The cry of "White Australia" is one that echoes from the east to the west of Australia. We don't want cheap labor in Australia. We say that any industry that will not pay white man's laboring wages need not come to our country. (Applause.) We are absolutely excluding from our territory all colored races. We have a few native blacks, but they are dying out. We have an island country surrounded by sea. No one can get to our country without traveling thousands of miles, and consequently we

have an opportunity of building in the southern ocean a commonwealth that in time will be not only a great one, but will be almost as great as the great commonwealth of the United States. (Applause.)

I say that we ought to have more community of interests between our land and this land. We are on the borders of the same ocean; the same Pacific that washes the western shores of America washes the eastern shores of Australia. We have in that ocean the greatest island population of the world, principally, I will admit, members of the eastern nations, and if the American nation will unite with the Australian commonwealth to make that ocean the greatest trade center in the world, we will surely succeed.

I have come to America to see you people, because I look upon you from the point of view of a certain amount of kinship. I have come to learn how you make your irrigation projects successful, because I know you work them along similar lines to those that we follow in Australia. I know that what you have done for arid America can be done for arid Australia, and you can show us people how to do it and the benefit of your experience, combined with our experience and our courage, will make the arid portions of Australia as good a country to live in as the arid portions of America are, and will be in the future. (Applause.)

MR. GEORGE H. MAXWELL, of California: Mr. President, I am sure that all who are present here to-day have appreciated in the most unusual degree the entertaining and inspiring address to which we have listened from our fellow-irrigator from Australia, and I have a motion to make, which is perhaps rather double in its aspects. I want to move a special vote of thanks to him for his address, and also at this moment to say that I am sure that the many friends of Elwood Mead, in the United States, and in this Irrigation Congress, of which he was at one time President, will be more than glad to know through Mr. Nielsen of the work that he is doing in Australia, and, in addition to that, I move a special vote of thanks to Mr. Nielsen, and that we should make Mr. Nielsen our messenger to carry to Mr. Mead greetings from the Irrigation Congress and to wish him full success in his new field.

PRESIDENT FOWLER: You have heard the motion by Mr. Maxwell.

MR. WM. E. SMYTHE, of California: I rise to second the motion of Mr. Maxwell and to add to what he has said my own warm appreciation of what we have heard from the lips of this gentleman from Australia, and to express my own admiration for Mr. Mead on account of his great work in connection with the important work of irrigation. (Applause.)

The motion was thereupon carried unanimously.

PRESIDENT FOWLER: I trust that Mr. Nielsen will have pleasure in conveying this message to Mr. Mead, and that he will accept for himself this cordial vote of thanks.

MR. NIELSEN: I thank you, but I do not like to accept your vote of thanks without offering to you my hearty appreciation for what you have done for me. I have come here practically a stranger in a strange land. I have made many friends already. I came here to give you an idea of what our country is like, and to carry from one of your old friends in Australia, Mr. Mead, expressions of good will and appreciation. I shall convey to him your message of good will, with very great pleasure. As far as I am concerned, I do not want any thanks at all, because I am here with the object of advertising my country and getting information, and I hope you will give it to me as freely as you can. I will not use it against you, but will use it in an-

other land far south. I accept your vote of thanks for my speech, poor as it was, and I shall be amply repaid if I have increased in the slightest that bond of friendship which should exist between the United States and the Island Empire of Australia.

A DELEGATE: I would like to know what the speaker meant by "Unimproved capitalized value."

MR. NIELSEN: When this land is broken open for settlement a value will be placed upon it between \$50 and \$100 per acre. These are the values that have been definitely fixed by the authorities controlling this area. Before a man takes up his land he will have the price laid down to him, at between \$50 and \$100 per acre. That is the only information that I can give you as to the exact details. Once that price is fixed definitely the man takes the land knowing the price, and he is charged on that price $2\frac{1}{2}$ per cent as rental right through the term of his tenancy, which will be as long as he likes, or as long as his descendants like.

A DELEGATE: Is that the actual cost of the land?

MR. NIELSEN: We have taken the cost of the land as we bought it, and I might tell you that when the bill was going through parliament authorizing the carrying out of this great project, a clause was put in the bill, that the land that had to be purchased by reason of this project was to be purchased at the value that it was at then, the date of the passing of the bill, so that no added value could be obtained by the owners of that land because the government had entered into this great irrigation project. (Applause.)

The result of that was this: that we were able to purchase the land at its pastoral value, at its sheep raising value. Having purchased the land at its pastoral value, we divided it into two portions, the portion to be worked as irrigable land, and the portion to be allotted as dry land. For instance, when we were buying out a man's ranch, as you call it over here—we call it a station—we wouldn't take a portion of his land that was irrigable, because he had bought the whole and was working it as a going concern; so we were fair and bought the houses. So that leaves us with a certain amount of dry land which cannot be irrigated. We put the value on the dry land equal to the value at which we bought this land for pasture. The price that we paid for the land at its pastoral value was about \$15, and we also put in addition the cost of the whole works, the head works in the canals, and it works out so that we can sell the land to a settler at \$46 to \$90 an acre.

A DELEGATE: How do you finance the project? By selling bonds against it, or bonds of the state?

MR. NIELSEN: It has been financed by the state.

A DELEGATE: What rate of interest do you pay?

MR. NIELSEN: We pay 3.8, and since we started this irrigation project, we have been able to get all of the money that we needed for it in our own state, and that is the best guaranty to people outside that it is a good project.

A DELEGATE: Are the homesteader's taxes paid upon the cost or on the improved land? Do you tax him upon the improved land or simply upon the land that you sell him?

MR. NIELSEN: No, he pays a rent for it every year. We don't ask him to pay for the land at all. We say that the government will keep this land, and we will let the man occupy it at a rental of $2\frac{1}{2}$ per cent on its capitalized value, and I think you all know that if

anybody that can get his place of business at a rental of 2½ per cent on its capitalized value—well, he is a jolly good fool to buy it. (Laughter and applause.)

MR. MAXWELL: I want to inquire with reference to the system under which these land purchases were made. I have gathered from what you have said that it is similar to what we do under our system—that is, that the government places the value and takes over the land. In other words, you don't have to pay any price that the private owner may ask you for it; you have a right to take over the land under the law.

MR. NIELSEN: When we were passing the bill, we took power to resume all of the land necessary to carry out the project. We call that the power of resumption.

MR. MAXWELL: In other words, you didn't leave to the owner himself the power to fix the price that the government should pay for it?

MR. NIELSEN: No. We said in the act of parliament that the price to be paid for this land was a price to be fixed on the value of the land at the date of the passing of the bill through parliament. So that the owner would not be able to secure the added value to the land because of the government undertaking this project.

MR. SMYTHE: When an Australian statesman proposes such plans as you have described, plans that are obviously for the good of the common man rather than for the good of the privileged man, and when safe and sane business men denounce him as visionary and unpractical, what explanation does he make for himself?

MR. NIELSEN: Down there?

MR. SMYTHE: Yes. I have been in that position a good many years, and I would like to know how you people get out of it.

MR. NIELSEN: We don't have to make any explanation down there, because our people are not afraid of a new thing. We in Australia are not afraid of any other parts of the world. We have come there because we are the most progressive of the other races, and let me say that we don't mind accepting any of you gentlemen as citizens, because we believe you will be a bit more progressive if you will come to Australia. (Laughter.) We are not afraid of a new thing, socialism or whatever you please to call it, in Australia. We have the greatest amount of practical socialism that exists in any part of the world. The state owns all of the railroads, owns all of the water, all of the artesian wells. It has charge of all of the irrigation projects, it owns all of the street cars. In other words, it owns everything that is necessary in the public interest, and in the interest of the public. That is what we call practical socialism. And that is not a bugbear down there at all. The people would like to see us owning a bit more. We only have to tell the people we are going to do it, and we do it right away.

MR. SMYTHE: In spite of that, does the sun still rise and set in Australia?

MR. NIELSEN: All of the time.

PRESIDENT FOWLER: We will now have the last paper of the afternoon, by E. J. Watson, Commissioner of Agriculture, Commerce and Industry of South Carolina, on "Vital Phases of Reclamation Work."

Address by

E. J. Watson

Commissioner of Agriculture, Commerce and Industry
South Carolina

VITAL PHASES OF RECLAMATION WORK

Mr. President, Ladies and Gentlemen of the National Irrigation Congress: Whenever I have heard that bell ring during the session, and my friend from Australia heard it awhile ago, it shook my nerves, for the simple reason that when we are accustomed to hear a bell ring like that in America it means an ambulance, or a police patrol, or that the fellow behind the gun has hit the bull's-eye. It rang three times on my friend from Australia, and I am absolutely certain beyond any peradventure that he hits the bull's-eye in Chicago. (Laughter and applause.)

There is no danger of it ringing on me.

Now, I am glad we are here; I am glad we are here in this temple of amusement, in this temple of song. I am glad that we are here in this place for the particular reason that we are here welcoming the first of all the goddesses, the Goddess of Agriculture. We may go away back, my friends, to Genesis, and we will find that the foundation and basis of everything is agriculture. Come to our own country here and we find what? The keystone of the economic arch in America, particularly in this United States of America, agriculture, and that keystone set in the arch and cemented there by what? Water.

We are here because of water. If we did not do what we ought to do as a nation with the God-given water, we could have no agriculture, and if we had no agriculture, we could have no commerce; we could have no finance; we could have no big business, no little business, no art, and not an iota of prosperity.

What goes to make a great nation? Agricultural products. In the United States we are strongly an agricultural people. I am here to tell you that we are the most wasteful agricultural people on the face of God's green earth, intelligent as we are. We have ninety millions of people already. We have begun to see the food supply fall short. Had it not been for southern cotton, the commodity of the South, extending across from Texas, this year and the year before in the markets of the world, the balance of trade would have been against America for the first time in her history.

We have heard the food supply is falling short. We hear of the congestion in the cities. I am one of those myself who has been crying the "Back to the land" movement. Why? Because we must look to human civilization in its highest form and there are but two primary fundamental needs in human civilization. One is food to sustain life and the other is clothing to keep the body warm while we are doing the work that we have set out to do.

In America here, we can raise all the food we want, and we have the monopoly of the world on the clothing of the world.

We have now come to the point of population where we must stop unless we can make the land ready for the man. And when the land is made ready for the man, the land must be made productive, so that the man can live and earn a competence from it.

What have we got in the West? I am one of the men of this country that takes the greatest pride in the magnificent accomplishment of a National Irrigation Congress. I feel that it is one of the greatest constructive forces that we have had in America.

I could not say that without passing a high compliment on the officers of this association, as I have known them and seen them work.

I have been through the West and I have seen the conditions. Out there we could have no New Mexico, no Arizona, practically no California, practically no some twelve or fourteen of the other best states we have in the Union to-day, had it not been for water and agriculture.

The land was not ready for man. You could not populate it until the government was roused to the fact that more land was needed if the country was to be developed properly.

Out there in those arid lands, the disintegration of the rock has proved Henckel's theory, the theory of the great German scientist on mineral fertilization. There you had a perfect condition provided you would take the God-given water and apply it to the soil, eliminating all need of commercial fertilization and producing a fertilized soil immediately for the man to begin to produce upon.

They have gone ahead and done that and done it there to the extent of some 14,000,000 acres of land at a cost of not more than \$30 per acre. Yet, the cry continues for more land, more production, more wheat, more corn, more everything to feed the other nations of the world upon. Here we are to-day actually importing foodstuff into America, with all this wealth of soil. With all this cry for more land there is yet in the United States of America 150,000,000 acres of land that can be reclaimed, put under cultivation, that will make homes for substantial, sound, good American citizens.

Just about half of it can be done by irrigation. Eighty-two million acres altogether of it is over here beginning on a line with North Dakota and South Dakota, Minnesota, Michigan, coming all the way down and extending over the East through thirty-nine states, as valuable land, when properly reclaimed, as any in the valley of the Ohio river now.

What does it need? Merely handling intelligently the question of water; that is all. Seventy-seven million acres of it are in the Middle West and East properly. And what is the character of it to-day? Pestilential, the breeding place of the malarial mosquito, actually inoculating the little children of two and three years; creating a continuing plague that the government ought to fight just the same as it is fighting the white plague or a plague like yellow fever, because it is more insidious and more dangerous in the long run.

That 77,000,000 acres could be reclaimed and put under cultivation, and could afford homes, high-class homes, for high-class people, at a total cost of not to exceed six dollars per acre. The engineering problems are a minimum in comparison to anything else. At one-twentieth the cost of irrigation, right here in this thick population, you could add six billion dollars in value to the land along both sides of the Mississippi, and you would add a billion and a quarter dollars to the agricultural products of the United States.

The two problems are one and the same, except that one has the health feature, the other irrigation. The condition is such that without the water the man cannot even try to live.

Your problem is one that you have well in hand. The federal government so far, and I am sorry to say the state governments as well, have done but very little to solve that problem.

Intimately connected with both of them comes water again, because when the man on land has raised something he has got to have transportation for it to the markets of the world, whether that market be here in Chicago for his hogs at a low and sacrificing price, or his Texas steers at a low and sacrificing price, it makes no difference. The essential fact is that you have to have transportation facilities, and you can go through the history of the world wherever you will and you can go through the old countries with me to-day and you will find it is the same. By the way, there in the old world, ever since the beginning of time, irrigation and drainage have been going on;

neither of them is a new proposition. But there you will find that water is the basic foundation of all transportation.

The European countries have realized what it amounts to to properly conserve the streams and provide regularity of flow and make those streams subsidiary to railway transportation lines, feeders to them from the remoter districts.

That is what the United States has got to do as a national problem before we are ever going to have any relief from this burden of railway rates that we are everlastingly kicking about. Then when you try to do that, go a little further, when you try to conserve the streams and have got to go up and wrestle with water again on the mountain sides and conserve the forests of the country, create the drainage to bring regularity of flow instead of bringing it all down in great floods from the upper regions as may be seen in China to-day where thousands are wiped out at one fell swoop, and in America, mark my words, we are rapidly going toward that very condition. All our timber is being most wantonly destroyed. You can see it in the Rocky Mountains in the West. Go through the South and you will see the southern pines almost wiped out and no effort at reforestation.

When you have your products and have got your way to get them to the market, what do you turn to again? You go back to water. In what shape? In the shape of water power. Water power from which you generate electric power, transmit it where you want it, and begin to drive the factories that manufacture the food products into the manufactured products to go to the markets of the world, and into clothing for you and me and our wives and our sisters and our daughters and to make shoes for us and everything else. There you are, water again.

Down in my state we have the largest water power development perhaps in this country. Take it all in all, something like 150 or 160 thousand horse-power development, and scattered by transmission lines all over the state, driving some 115 textile plants representing something over four million whirling spindles.

Our people have permitted, and the United States government has permitted, looked on quietly—permitted these valuable rights to be absolutely absorbed and taken over without a scintilla of restraint on the part of the government looking to their preservation.

There you are again with water power. And so I could go on and show you our wasteful methods, when it comes to the conservation of the soil. Most of you men when you know farming condition, know that you cannot farm without proper conservation of moisture in the soil through humus. It is true the United States Department of Agriculture and my good friend, James Wilson, have done wonders in this line. They have the American farmer largely awakened in that direction and there is something doing these days in the maintenance of soil fertility, but the worst part of it all is that the great mass of our producing people handling the soil are being permitted to exhaust the soil fertility rather than increase it.

Now, there you are with a lot of conservation. Vital phases, they are vital phases because they practically are the very basic foundation of American finance. It is no wonder you men who are interested in irrigation and you men who are interested in drainage here are standing shoulder to shoulder.

You have here telegrams from the Governor of Virginia and from the Governor of Alabama, and from the Governor of Florida, and nearly every commercial body in the South Atlantic territory, inviting you and begging you to stand by the subject of drainage, because it is vital to them, and to bring your body down there and meet where they think it will be doing the greatest amount of good. I know you can not do it. I know that you distinctively belong and your mission is in the West.

I am trying to-day, with Mr. Williams, to do humid irrigation work in the South Atlantic territory, and we are having great success, but I have mentioned these various phases of these vital problems that confront the American people to-day for the reason that our government is permitting a degree of wastefulness here that is a disgrace to the nation.

PRESIDENT FOWLER: The gentleman's time has expired. Unless there is objection, however, I would like to have the Colonel complete his address this afternoon. It is not often that we have a representative from South Carolina with us. We do not have them every year. I know it is late, but the audience is interested, and our friend is talking upon a vital subject, and I have no doubt, Colonel Watson, that the audience will be glad to have you continue. (Applause.)

MR. WATSON: I shall only touch very briefly, thanking you for your attention, on these facts.

I said that the government was permitting a degree of wastefulness to go on that ought to be stopped. I mean it. What are we doing? This government has been supposed to be a government of the people, by the people and for the people. I need not ask you gentlemen here to run over in your minds when you recall your knocking at the door of Congress; I need not ask you, I say, whether or not it is a government of the people, by the people and for the people. I will ask you whether it is not a government of the politicians, by the politicians and for the politicians. That is really what it is.

We see men in Congress who sit down there and actually forget the fundamental economic principles of the people at home. My friend, Mr. Coburn, over here in Kansas the other day summed up the government situation in this way. He said: "Nearly one million dollars a day is being spent by the government for war purposes in the army, in the navy, and for pensions, or 67½ per cent of all government expenses are incurred for war purposes, yet in time of war, as has ever been the case, the volunteer soldier from the farm has to be the nation's reliance for national defense and aggressiveness. For education, 3 per cent represents the expenditure, and for agriculture 1 4-5 per cent; for feed, \$1; for fight, \$37; for brains, \$1; for bullets, \$22; to encourage production, \$1; to encourage idleness, \$37; to shoot brains in, \$1; to shoot brains out, \$22; for culture, refinement and education, \$1; for shot-gun business, in time of peace, \$22. Agriculture and education neglected and support humbly begged for; army increasing, food supply decreasing, fertile soils becoming barren."

That is the way he summarizes it; brings it forcibly home. I don't want to be radical, or anything of that kind, but I do assert, and I believe every man in this hall believes the same thing, that the time has about come when men patriotically interested in the future of our commonwealth have a right to ask Congress to make the land habitable and healthy, first, and then to make it productive, and enable the producing classes in America to get the maximum of production and roll our commerce out on the Atlantic and on the Pacific until once more we shall be getting the maximum of results.

I have talked too long. I didn't want to do so. We are deeply interested in the South Atlantic States in the question of drainage. Since this body has been here there has been a conference upon the subject. Everything in connection with that conference, however, my friends, has been predicated upon the absolute loyalty and fidelity of every man connected with it to this parent organization—and if the other organization be formed, I feel that I do not mistake the case when I say that that organization expects to call itself the child of the National Irrigation Congress, and to help that Congress in its work, and it wants that Congress to help it in its work. (Applause.)

I, for one, would not belong to any organization affecting water—and I belong to them all—if I felt that there was one degree, or element of petty jealousy or rivalry between them. We are all after a common purpose, and to-day it fell to my lot to suggest that if we did organize a branch organization, that the National Rivers and Harbors Congress, the National Irrigation Congress, the Waterways Organization, all appoint a committee of three of its best men for the interchange of ideas, and the interchange of information, as to the needs of each, so that the atmosphere could always be kept clear and the spirit of co-operation prevail, and that when you went to Congress with every organization interested in the water problem, you would go supporting the other man's proposition just as much as your own.

I thank you very much. (Applause.)

PRESIDENT FOWLER: I think it is needless for me to say that the Irrigation Congress endorses the principles put forth by Colonel Watson and wishes well to any organization that has for its object the development of water, or the drainage of land that shall make this country more prosperous and life better worth the living. (Applause.)

We have now finished the program for the afternoon, and have caught up.

There being nothing to come before this session, I now declare it adjourned until 8:00 o'clock this evening in this Auditorium.

At this time the Congress adjourned to meet at the time and place designated.

TENTH SESSION
FRIDAY, DECEMBER 8, 1911

8:00 o'clock P. M.
AUDITORIUM THEATRE

The Tenth Session of the Congress was called to order by President Fowler at 8:00 o'clock P. M., when he introduced the speaker of the evening, Mr. M. O. Leighton, of the United States Geological Survey, who spoke upon the national aspect of drainage.

Address by

M. O. Leighton

Chief Hydrographic Branch, United States Geological Survey

NATIONAL ASPECT OF DRAINAGE

(Illustrated by Stereopticon).

That which I have to suggest is based on two fundamental principles: first, that natural laws are superior to man-made ones, and when the two kinds are opposed, as they sometimes are, man is very foolish to handicap himself by trying to sustain those of his own make; second, that government is merely a means to an end, that end being to enable the people to satisfy their needs and desires in the wisest way. I hold that these two principles do not admit of argument.

Some parts of the earth are not, in their natural condition, well suited to man's occupancy. Man has therefore seen fit to readjust the face of nature to suit his particular needs. In the course of this readjustment he has changed rural conditions into urban ones, has diverted the course of rivers to make the arid places productive, has tunneled mountains, bridged chasms, leveled hills and even diked off the ocean itself. These and a thousand things more has man performed because nature has not arranged and constructed to his liking. But though nature has shown a cheerful disposition to submit to such changes, she has always insisted that they be made in certain ways. Whosoever violates her laws must finally fail of his purposes. Do you know of any exception to this rule?

This great Congress, of notable record and honorable achievement, typifies the discontent of man with certain of nature's desert conditions. To remedy these, this Congress has advocated the diversion of waters from their natural courses in order that arid land may be made to produce. It is fitting that having seen this proposition gaining headway at every milestone, with ultimate success as inevitable as the round of the seasons, this Congress should now, with that helpfulness and altruism that has marked its every act, lend a part of its energy toward the conversion of another great natural blot into a place of American homes and fertile fields so that the East and the West, the North and the South may unite in that inspiring demand of the Irrigation Congress, "Make homes on the land."

The natural blot of which I speak is made up of the swamp lands of the United States. As a nation we require the riches that lie disguised in them. As a people we can not feel that our full duty has been performed until we have made these swamp lands centers of prosperity and comfort for ourselves and those who shall come after.

To do this we must again change the face of nature and we must make that change in accordance with nature's laws.

What is a swamp? It is merely an area of land which, because of some adverse natural conditions, has been deprived of or denied a suitable outlet for its surplus water. That water therefore accumulates in or upon the ground and renders the area too wet for man's comfortable occupation. It also prevents the entrance of air into the ground. Now, air, or the oxygen contained in air, is as essential at the plant roots as it is at the plant leaves, and so it is that in swamps we have a dense wet soil generally stagnant, on which nothing of a very useful character will grow except certain kinds of timber. Food crops, on which we depend for sustenance, can not grow in such soil. In the case of naturally well-drained land nature has provided suitable water outlets at proper grade. In the case of the swamp she has left this undone and the whole function of man in reclaiming swamp lands is to supply that which nature has neglected. In supplying that need, in remedying that defect, we must be governed by precisely the same laws that nature followed with respect to lands that receive her complete attention. Look at any well-drained river basin—you will find that the main stream and its tributaries are harmoniously adjusted to each other with respect to width, depth and slope. That portion of the channel in the lower valley has a capacity sufficient to safely carry off the water that may come from the entire drainage area. The small creeks high up on the divide are taken into account in adjusting that capacity.

Where one part of a river system joins another part the channel below the junction of the two streams is of the right size to carry the waters of both. There is harmony and unity and an undeviating fitness of all things in the basin. Supposing, now, it should occur that the upper part of the basin did not harmonize with the lower part? Supposing, for example, that the upper part were well drained and the lower part poorly drained—what would occur? A proper answer to this question is furnished by the great Mississippi Valley itself. Much of its upper portion is well drained, while its lower part is a flat delta region. The result is a great overflowed and swampy country from Cape Girardeau to the Gulf. Look at the Kankakee basin over in Indiana, just being awakened after the sleep of centuries. Look at that enormous wheat area in the valley of the Red River of the North, and that vast rich bottom of the Tombigbee in Mississippi and Alabama. These are the very conditions that we are trying to correct by artificial drainage. Yet, in many of our drainage schemes we are endeavoring to perpetuate the very procedure which in nature resulted in swamp conditions. In numerous places we are draining the upper portions of swamp without providing suitable outlets for water in the lower portions. This process not only makes the drainage works less effectual than they would otherwise be, but it also accentuates the swamp conditions in the lands below.

Artificial drainage creates new conditions. In its natural state a swamp gives up its water slowly. If that were not so the land would not be swamp land. The rivers draining that swamp are accustomed to receive the water only at the rate at which the swamp gives it up, therefore those rivers have through long ages become habituated to receive water at that rate and at no greater rate. Therefore, when we drain wet land, it can not be sufficient to dig ditches through a great area and discharge the water into streams that are not adapted to that increased rate of flow. In rational drainage it is necessary to consider the whole basin—the hill land as well as the low land, and the drainage system must be fashioned with due regard for every part.

The necessities differ in no essential degree from those of a sewerage system of any city. No one would think of building the

upper end of the system without regard to the lower end, nor of dividing up the problem into districts to conform, for example, with city ward lines, and constructing each without regard to the other. In laying out a city sewerage system we must at the outset design each portion, from outlet to highest point, so that when the whole is eventually completed it will become an harmonious drainage work. The same plan is demanded in swamp drainage. Whether the swamp be one mile or one thousand miles long, it must, if included within a single river system, eventually be reclaimed as a unit. Of course, this does not apply to coastal marshes like those of Louisiana, where the logical process is to dike off lands and to pump the surplus water into canals that discharge directly into the ocean. It applies, however, to by far the greater area of our swamps, where the reclamation must be accomplished by gravity drainage into natural streams already established. In such cases those natural streams must be enlarged and adjusted as far down their courses as is necessary, and even at times to their ultimate reaches.

That is the way nature drains—that is the way we must do it. The laws governing drainage differ widely from those governing irrigation. In the latter we must decide how much land can be irrigated with a certain amount of water. We can conduct the water on the land we designate and can leave neighboring lands out of consideration if we choose to do so. This can not be done in drainage work. In a swamp the water is already there. We take it out by digging gravity canals and lowering the water table. We can not define off-hand the extent of land that is to be benefited by that canal. The extent of benefit depends on natural soil conditions, and the influence exerted by a drainage canal may be narrow or it may be wide. If a drainage district, for example, recognizing that it must provide a suitable outlet for the surplus water that it discharges from the district, enlarges the natural channel or digs a new one beyond the district boundaries far down to a remote point at which a suitable outlet is provided, that channel will benefit by drainage all the country that it passes through, whether the district authorities like the result or not. Such a benefit to the lower region must be paid for by the people of the district.

In other words, they must be assessed for benefits to lands in which they have no immediate interest. We might illustrate a score or more of conditions of similar purport, all of which prove substantially that logically, ethically and financially the drainage of a swamp should comprise all the lands in a particular basin. There should be participation in the expense by every land owner, or there will be an inequitable distribution of expense. Is it not evident, then, that drainage is a big affair, to be planned and executed on a broad basis and to be financed in a way that will insure success? Drainage is no "peanut-stand" proposition, and it is just as absurd, just as foolish, to try to divide a great swamp up into unrelated districts as it would be to divide up a great trunk railway system into a collection of unrelated county or municipal units. But up to the present time our drainage work has largely been on a "peanut-stand" basis, and many of the propositions for future development are conceived with no more breadth of view. There is only one drainage project from Cape Girardeau to the Gulf; only one in the valley of the Red River of the North; one in the Tombigbee valley; one on the Apalachicola; one on the Kankakee of Indiana; and one on the Suwanee of Florida. I know that good men say that such a conception is too large and impracticable, but I am persuaded that this can not be true. It is my opinion that the problems involved in the drainage of all the swamp lands in the United States combined do not encounter the real difficulties and the untried engineering questions that are comprised in the construction of the Catskill water-supply tunnel of New

York, or the installation of the new water-supply of the city of Los Angeles.

I have suggested in a brief and incomplete way that which seems to me to be the necessary scope of a drainage system, and have tried to show that there are certain immutable laws of nature that must govern every drainage operation. Of course, it is not intended to imply that every drainage scheme must at the outset provide for the immediate reclamation of every part of a swamp area, however great. That which is insisted upon without any reservation whatsoever, is that no drainage scheme should be carried forward without a study of the entire basin within which lies the part immediately to be drained, and that every piece of work done, both interior and exterior, must be fashioned with due regard for the necessities of every other part of the basin. While it may be necessary or expedient in certain cases to drain lands by reclamation in small progressive units, the tendency should ever be toward the larger and more comprehensive work, bearing in mind that the end for which every one should strive is the inclusion of all swamp lands within any river basin. In one region at least, of which I have personal knowledge, the people, having started out on a broad and comprehensive basis, are now inclined to divide up the original area into several independent districts. That is real retrogression, and I can conceive of no greater drainage folly.

In the light of the foregoing conception of drainage let us look at some of our swamps. Beginning with the most famous, the Dismal Swamp, we find that it occupies parts of Virginia and North Carolina. A little farther south there are those areas lying on both sides of the North and South Carolina state lines. The northern part naturally drains to the southern part. The Savannah River on the northern border, and the Apalachicola on the southwestern border of Georgia, have great swamp and overflow areas in South Carolina, Alabama and Florida. In southern Georgia, too, there are the Okefinokee swamps which, if drained, must have their outlets across the state of Florida. The Tombigbee Valley in Mississippi lies above the same valley in Alabama. The Pearl-River bottoms occupy parts of Mississippi and Louisiana. The St. Francis basin lies in Missouri and Arkansas; while the swamp areas of the Red River of the North occupy Minnesota and North Dakota. Instances like this could be multiplied greatly. Wherever we look we find swamp conditions that cover land in two or more contiguous states. In other words, the greater part of our swamp drainage problems are interstate.

What are state boundaries? They are lines established by man to mark off separate legal jurisdictions. They are placed where they are by virtue of conquest, discovery, agreement, or otherwise. Except when they occupy the crest of a drainage divide, they do not conform to any natural division, and natural problems and necessities are in no wise changed when state lines cross any particular basin or swamp. The natural laws governing the drainage of swamps were established long centuries before such things as state lines were conceived by man. Can it be believed that the drainage necessities in the St. Francis basin, for example, are altered in the slightest degree by the fact that the people have thrown the Arkansas-Missouri boundary across this basin? Of course, such an assumption is preposterous. And yet, on the two sides of that boundary line there are separate jurisdictions, different laws and processes, and there is not even a remote probability that under present conditions there can be any unity of action on the two sides to comply with the unalterable nature requirements. Missourians, with commendable enterprise, have drained large areas of their land. The people of Arkansas must tax themselves to take care of that surplus water. When they reclaim their portion of the St. Francis basin, a part of their cost will be for the proper

disposal of the water which the people of Missouri have thrown down upon them.

Is it not clear that the logical and the just way to have handled the St. Francis problem would have been to drain that basin as a unit, each owner without respect to local jurisdiction, paying his share of the whole system cost? When we assess benefits for a city sewerage system we do not charge the owner of land located near the outlet a larger price than the one located at the head of the system, merely because the sewer in the street adjoining the lower lands is larger and laid deeper than that serving the upper lands. We assess the owner at the upper end for his proportionate share of the cost of that large outlet sewer. The principle is precisely the same in the St. Francis problem—and so it is in all other interstate swamps.

How can the matter be adjusted under two separate jurisdictions? Some one may say that the states can unite for this common purpose and to carry out the work under mutual agreement. Possibly this may be done; but we have yet to see a successful example of it. There are many who believe, as a result of observation of interstate matters, that the logical and wise way and the only surely successful one is the intervention of a common authority. And what is the established common authority as between states in this country? It is the federal government. I believe most thoroughly in providing every orderly safeguard that may be necessary to preserve the integrity of local government. There can be no virtue in any proposition that would needlessly deprive any locality or any state of its prerogatives and transfer them to the nation. On the other hand, it appears to be a matter of simple logic and plain common sense that where the established requirements of an artificially divided jurisdiction in any place are inevitably opposed to the fundamental laws of nature that require common jurisdiction in that place, the requirements of the former must give way to the necessities of the latter in so far as may be necessary to accomplish the ultimate purpose. The simple fact is that we have in the drainage of interstate swamps a condition into which our much revered governmental precedents will not fit. We are confronting a new problem which requires the adjustment of our governmental ideas. It is a testimonial of our progress and an indication of our economic needs that we are so confronted, and it is inconceivable that the American people will fail to adjust themselves to any condition that forces itself upon them as a result of their enterprise and foresight.

But the national aspects of swamp reclamation are not confined to those of engineering necessity. Other aspects of economic necessity are truly federal in fact, if not in law. Moreover, these aspects are by no means confined to interstate swamps. Seventy-four million acres of swamp land lying in almost every state in the Union constitute of themselves a sufficiently important issue to make them a matter of general welfare.

First and foremost, our swamps are the greatest single menace that now remains to public health. This Republic has from its beginning and in common with the rest of the world been subject to an enormous drain by reason of disease. Men of science have pursued these diseases, and, by hazardous labor, have brought out of obscurity fact after fact concerning them and the means of their prevention. Some diseases have not yet been run to earth but others are fully exposed, and we are reaping the benefits of the information. Swamp lands harbor the agents by which at least two destructive diseases are spread abroad. Malaria and yellow fever are transmitted by the mosquito and in no other way. Time at my disposal does not permit of a discussion of the mosquito agency in these two diseases and it will be sufficient to state that such an agency is an established fact.

Malaria has always been a silent but persistent scourge. Yellow fever has come repeatedly upon us, scattering terror like a horde of savages and leaving in its wake broken households, sorrowing communities, deserted markets and financial loss. Malaria is still with us. Yellow fever will surely come again, and the pity of it is that we fail to use the means that have been placed in our hands to stamp it out forever. Is not this a federal matter? Consider a moment. Yellow fever visited New Orleans in 1905. In the dire emergency of that time it was considered a wise and proper use of federal authority to send national experts and federal money there to conquer the epidemic. Would it not be wise and proper also for the nation to prevent the evil as well? It is a wise statesman who responds to an emergency. It is a wiser one who foresees that emergency and makes ready for it.

Another national aspect of swamp drainage is that of home-making. In their present condition the swamps of the country are a source of weakness in our national economy. They are now unproductive; they can be made sources of great national wealth. They are now practically vacant; they can be made to produce citizens. In other words, they can become the sustenance of the very element of which this country is made up. Seventy-four million acres of drained swamps can be made to support at least 7,000,000 people in agricultural pursuits. Is not this a national matter? Does it not enter into every element of production, trade and finance? Does it not become an essential feature of national stability, national progress and national defense? And if all these matters are not truly federal, why, then, has the federal government entered so largely into them in the past? The facts are that an issue so big and broad and inclusive as the reclamation of 74,000,000 acres of land must be a national matter, whether we would have it so or not.

I have not come here in advocacy of any particular measure. My whole function is to emphasize, as well as I may, the facts concerning the particular necessity. In the adjustment of state and federal relations there is no necessary complication, no permanent relinquishment of state sovereignty is required, nor any permanent expansion of federal authority. From a practical standpoint I can see no difficulty in securing constructive co-operation by all parties concerned. To reclaim these interstate swamps there is required a broader jurisdiction than is possessed by any one state and a more extensive credit than is possessed by any individual to whom settlement upon agricultural lands is attractive.

There are many who will be opposed because the plan violates legal precedent, and many more will oppose it because of what they believe to be constitutional limitations. Whether or not there be any such limitations I am incompetent to determine, but as one who believes that government is the means and not the end, I am unable to see any insuperable obstacle. And when they who oppose rise up and cry "The Law," it appears as though the proper and comprehensive reply must be "The Necessity." In days like these one can hardly find himself justified in refusing to do a necessary thing because that thing was not foreseen by our forefathers. (Applause.)

Following Mr. Leighton's address, the convention adjourned to meet at the Auditorium Theatre, Saturday, December 9, 1911, at 9:30 o'clock A. M.

ELEVETH SESSION
SATURDAY, DECEMBER 9, 1911

9:30 o'clock A. M.

AUDITORIUM THEATRE

The meeting was called to order by President Fowler, at 9:45 o'clock A. M.

PRESIDENT FOWLER: The Congress will come to order. The first thing this morning that will be presented to the Congress are the resolutions that were authorized to be drawn yesterday in memory of the officers of the Congress who have passed away during the year past. The Secretary will read them.

Secretary Hooker then read the following:

[REDACTED]

IN MEMORY OF JAMES S. COSGROVE

WHEREAS, During the past year death called from among us James S. Cosgrove of South Carolina, a member of the Executive Committee and an effective worker in the interests of irrigation,

BE IT RESOLVED, That the Congress in deep sorrow offer a word of tribute to the work and character of our former fellow delegate, James S. Cosgrove, a zealous worker for this organization, a man of exemplary character and one of those citizens who leave the country a heritage in inspiration for good. His influence will live long in our memory.

IN MEMORY OF HARPER S. CUNNINGHAM

WHEREAS, The Congress has this hour learned of the death of Judge Harper S. Cunningham, a member of the Board of Governors for the Pueblo Session,

BE IT RESOLVED, That the Congress record an expression of profound sorrow at the loss of one whose services to the organization have been invaluable and whose estimable and personal character was a constant inspiration to those who knew him.

[REDACTED]

PRESIDENT FOWLER: You hear the resolutions as read by the secretary. What is the pleasure of the Congress?

DR. W J McGEE, of Washington, D. C.: Mr. President, I would like to move you that the resolutions be adopted, entered in the records, and that copies be sent to the families.

The motion was duly seconded and carried.

DR. MCGEE: Mr. Chairman, while I am still on my feet, may I confess thus publicly, and a confession that ought to be good for the soul, that through a slip yesterday I made a wrong reference in a certain motion. I moved you that certain papers be referred to the incoming Executive Committee, forgetting for the moment that it is the outgoing Executive Committee who are responsible for this entire meeting and for the proceedings that grow out of this meeting.

I move you, sir, that the action of yesterday be reconsidered, and I would then move that the matter be referred to the old Executive Committee, in case of the adoption of this motion for reconsideration.

The motion was duly seconded and carried.

DR. MCGEE: Mr. Chairman, I now move you that those papers be referred to the present Executive Committee.

The motion was duly seconded and carried.*

PRESIDENT FOWLER: Five minutes have been promised to Mrs. Vernetta Morse of this city, who will present from women's standpoint, some ideas concerning the objects of this Congress. (Applause.)

Address by

Mrs. T. Vernetta Morse
of Illinois

Mr. President, Ladies and Gentlemen: I think this is the first time in my experience that I have ever had the privilege of addressing a great western enterprise like this, although I have had some experience in the West. But as I have sat here day after day, and attended nearly every session of this Congress, I have been impressed with its great importance to the women and to the home, because it is the home that woman stands for. I am not so sure that I have not found paradise since I have been here. I do not quite agree with our President that it may be in Idaho, or it may be in Dakota, or it may be in California or in Mexico. I think I know where it is. It is in the hearts of the people that make those homes. (Applause.)

It is in the location of those people and their beautiful work, their standing shoulder to shoulder for each other. That is where paradise is, no matter in what state, even in our little state of Connecticut, that has been represented by the only delegate—a woman—here, and is just as great a paradise as Arizona, according to my belief. I stand before you to-day representing some 35,000 women in the State of Illinois. I hope we shall be able to carry the threads of this Congress for at least one whole year and probably more. I believe that the record of this Congress and the thoughts it has brought to Chicago will permeate all the avenues and streets for many years to come. I believe it is going to have a marvelous influence upon our business growth in regard to the West. But more than that, I believe it is going to influence woman to feel that in the West is a great opportunity for her children.

Judge Hutton said from this stage, if you wish to have a good lawyer in the water service, catch him while he is young; and gentlemen, if you wish to have good men in your irrigation service, if you wish to have loyal citizens in the West, if you wish to have men who will stand for both the West and the home, catch them while they are young, catch them while they are in their mother's arms; catch them while they have their mother's influence, and give that mother a reason for feeling that their future can be no better established than in the West.

My own work and the work of our association has been to raise the standard of the vocational occupations of women in the United States. We are laboring almost without hope. I could never understand why it was that two people of the same social standing, of the same educational advantages, one a man and the other a woman, should have such a different standing in the vocational work of this world. A man goes to a small town, he establishes a laundry, he puts in perhaps \$50 and goes in debt for the rest, and he sends our linen home in such bad shape that we are all ashamed because we employ him. Possibly he supports a family in good shape, possibly he does not, but we will take a man that does support his family in good shape—we are not speaking of any other class of people.

Take a woman with her children. She goes into another town of exactly the same size. She takes care of the linen of that town, she

*See Mr. Bartlett's remarks Friday morning. At a meeting of the Board of Governors held late Saturday morning it was decided unwise to print controversial matters which had not been presented before the Congress.

does the washing and ironing, she does it so beautifully that every woman in town speaks of Mrs. Jones who does the most perfect washing in that town. No one can do such work as she does. They all want her and they all want her on the same day.

There comes along a Congress, not so large perhaps as the one that we are addressing to-day, but something of equal importance, a Fourth of July celebration. The man is put upon the committee; he is there to meet the great men who enter the town. The men marvel at his great strength, and the women of the town go to work and they give a magnificent banquet in the church, but where do we find Mrs. Jones? We find her behind a screen washing dishes. That is all that is accorded woman, no matter how great her work, as long as she is doing what we consider menial labor. I believe there is no such thing as menial labor. I believe that education raises it above that standing, and what I wish to say this morning is this:

We have in all our great cities women who, through misfortune, through sickness or death, are left with families to support; women whose hearts are aching for the country; women who have been raised upon the farm and know that they can do the work if they only had the opportunity. Women who would take their boys and girls and who would be glad to have them on the farm, and there is no way of getting them there. I say to you, gentlemen, that there is no greater work that you can do in this world—we won't call it charity, we might call it a missionary work—but you cannot look upon it as charity—you can do no greater work than to set aside in your great irrigation service 160 acres of good land, give it to some association that will stand back of it and will locate upon it those mothers and their families, and let them bring up their boys to respect your work. (Applause.) That is the kind of labor you need, and when you are doing that, gentlemen, do not forget the fathers and mothers, the old fathers and mothers who have carried through this work, who have brought up their families, and the grandfathers and grandmothers, whom perhaps death has left alone in the world, those two hearts that beat as one. Do not forget that they need the same help, and give it to them. I thank you. (Applause.)

PRESIDENT FOWLER: The resolution that was referred to yesterday is as follows:

PRO BONO PUBLICO

WHEREAS, It is a duty of mankind to show public appreciation to all individuals who in any way help it to progress and betterment, and

WHEREAS, This Congress has an opportunity to accomplish the above mentioned duty on behalf of all who in any way or manner do something for the benefit of agriculture, and

WHEREAS, The manifestation of this appreciation will bring emulation and sanction for all those wishing to help in the great movement which constitutes the aim of this organization, therefore

BE IT RESOLVED: That an order under the name of "Pro Bono Publico" be established with its corresponding decoration, which the person who receives it may show at any time as the token of human gratitude.

That ipso facto all the executive heads of all civilized countries be and hereby are considered as honorary members of this order.

That all ex-presidents and presidents elected, and to be elected in the future, for this association be considered as honorary members of this order, that at the proposal of any one of the executive heads of all countries, and also by a majority of votes of the delegates at any of our conventions, such persons as may be considered as being deserving of human gratitude be also appointed as members of this order.

The decoration above mentioned to be in the shape of a white enameled five-pointed star, in the center of which the emblem of our Congress may appear in gold relief, surrounded by a cactus tree (representing the vegetation of the arid zone), and an oak branch (symbolical of the fertile zone), both in green enamel. At the intersection of the branch on the blue ribbon the motto "Pro Bono Publico."

This decoration to be suspended from the claws of the American eagle carrying in its beak a ribbon with the name "National Irrigation Congress," both attached by a wide ribbon of these colors: yellow (representing aridness), white (representing water), and green (representing fecundity).

The Executive Committee of the Congress is hereby placed in charge of the execution of the details referring to the carrying into practice of this resolution.

(Signed) MANUEL GONZALEZ,
From Costa Rica.

PRESIDENT FOWLER: This was proposed by Mr. Gonzalez out of his appreciation of what he had seen and heard in connection with this Congress. He is greatly impressed with the work of the Congress, and he felt that it could be made more wide-spread through some such order as this and that it might increase the present interest and assume even a greater interest in succeeding years. What will the Congress do with the resolution?

DR. W J MCGEE, of Washington, D. C.: My suggestion is, and it is a suggestion inspired in large measure by the regret that the resolution did not come before the Congress at an earlier hour in order that it might receive consideration by the Resolutions Committee, my suggestion—and I will be glad to put it in the form of a motion if that be desired, is that it be referred to the incoming Executive Committee in the hope that appropriate action will be taken during the ensuing year by the next Congress.

The motion was seconded.

PRESIDENT FOWLER: It has been moved and seconded that this be referred to the incoming Executive Committee for consideration and action. Are there any remarks on this action?

The motion was carried by a viva voce vote.

PRESIDENT FOWLER: Another illustration of the agony that we are passing through, and we shall not get through it until the Congress adjourns.

I have here a telegram:

Portland, Oregon, December 8, 1911.

Secretary National Irrigation Congress, Chicago:

Please express to the Congress sincere regret at unavoidable absence. The lumber interests of the West and United States have a deep and abiding interest in the cause of irrigation and pledge their hearty support to the irrigation projects of the West and the drainage reclamation projects in the South.

(Signed) GEORGE M. CORNWALL,
Editor "The Timberman."

Mr. Cornwall had expected to present a paper at this Congress. President Fowler then read the following letter:

Isthmian Canal Commission, Canal Zone.
Culebra, C. Z., November 25, 1911.

Mr. Arthur Hooker,
Secretary Nineteenth National Irrigation Congress.
Chicago, Illinois:

Dear Sir:

I am receipt of your letter of the 11th instant, inviting me to ad-

dress the National Irrigation Congress at nineteenth annual meeting, December 5-9, but regret to state it is impracticable for me to accept, as it is necessary for me to be on the Isthmus at that time in connection with an official visit from the House Committee on Interstate and Foreign Commerce.

Thanking you for the courtesy of the invitation, and again regretting my inability to accept, I am,

Yours very truly,
(Signed) GEO. W. GOETHALS.

PRESIDENT FOWLER: Col. Goethals was asked to deliver a paper, and at one time we were encouraged to believe that he would be here. The paper he would have presented you all know would have been an exceedingly interesting one.

We also have another letter. These have just come in this morning. The other letter is also from the Canal Zone.

Isthmian Canal Commission, Canal Zone.
Ancon, Canal Zone, November 25, 1911.

Mr. Arthur Hooker, Secretary,
Nineteenth National Irrigation Congress,
Chicago, Illinois.

Dear Sir: Your very kind invitation of November 11 has just been received.

I am allowed by the Government only two months' vacation a year and for this year my vacation has been used up, I will, therefore, have to decline your very flattering invitation. Otherwise it would give me great pleasure to address the Congress.

Yours very truly,
(Signed) W. C. GORGAS.

We had anticipated the pleasure of listening to papers from these three gentlemen at this Congress, and while some newspaper men have referred to it rather slightly, to the officials of the Congress who spent so much time and worked so hard—for it is not an easy matter to pick out sixty speakers from all over the United States and get them in the proper correlation to our work here—it is somewhat painful when good fortune seems to be in our way, to have it pass us by.

The first speaker of the morning will be Dr. W. A. Evans, former Health Commissioner of Chicago, who will speak on the subject of "Stream Pollution."

Address by

Dr. W. A. Evans

Former Health Commissioner of Chicago

STREAM POLLUTION

Mr. Chairman, Ladies and Gentlemen: As I look out over this audience I am convinced that for some reason or other you are not attracted here this morning. There is a possibility that irrigation in Chicago is rather easy, and that those who know the ropes need not come as far as the Auditorium in order to irrigate or to learn concerning irrigation.

I see that this audience is composed in the greater majority more of representatives of the states that need irrigation than of the representatives from the humid or wet states. Another idea that I get is that population is not as dense in this country as it has been reputed; that there are still areas unoccupied, and opportunities undeveloped, for instance, in the state of Illinois. And then perhaps another reason

is that you believe that the resolutions that are to be presented have been fought out, and the passing of them is to be more or less a matter of form; therefore that there is nothing to attract you save the speeches that are to be offered.

I am sure that you are interested in everything that Dr. Wiley has to say. (Applause.) I believe that is unanimous so far as this audience goes, and practically unanimous throughout the country. Possibly you do not understand that you are interested, you gentlemen who represent an interest in irrigation, are likewise interested in the question of stream pollution.

I attended the meeting of the Committee on Resolutions on yesterday afternoon, and I heard a doctrine that apparently was an accepted doctrine, although there was some dissent. It was that a stream was to be regarded as a unit, that there was a community of interest between all parts that contributed toward that stream, and possibly toward which that stream later contributed; that there was a community of interest between those that occupied the ground where the water was being gathered for that stream and those that occupied the soil in proximity to or through which that stream was to flow; that there was a community of interest between those that used the waters of the stream for purposes of commerce, of manufacture and of drinking. I believe that this principle carried but one step forward is a demonstration of your natural interest in the subject that I am to discuss, namely, "Stream Pollution."

There are certain parts of the country where it is not of such great consequence as in other parts of the country. I believe that in the main you come from those parts of the country where it is of more or less interest.

A great part of this country has so much underground water that it is possible to secure water supplies for its citizens without making use of the water within its streams; but there are parts of this country where cities cannot grow save as they are so situated that they can make use of the water of streams. It is not of the same consequence that a city supplied with artesian water should keep its streams unpolluted as it is in the arid regions where a considerable part of the drinking water of the people is taken from the streams. It is possible for an isolated well in an eastern community to be polluted and do a minimum amount of harm, affect but a single family or at best but a small number of families; but in parts of the country where there is a community water supply, they are affected throughout the length and breadth whenever there is an affection of that water supply through stream pollution.

I read, furthermore, that your organization had two functions. One of these is the saving of waste, and that touches a sanitarian at every point. Another thing, that you are interested in is the problem of the use of water, the problem of removing water from lands whose effectiveness is being hampered by reason of an abundance of water, the problem of putting water on land whose resources are ineffective by reason of a lack of water.

The use of water appeals to you, and as a part of that community of interest, it appeals to the sanitarian, for nothing save water has the same importance from the health standpoint as water.

Water streams are being polluted in a number of different ways, and the first one that I wish to discuss is the question of sewage disposal. Commonly streams are used as a method of disposal of the sewage, since it is the cheapest method, and for certain communities is the most effective method. The theory is that the pollution of those streams will be remedied by time and by the cleansing and purifying processes that will occur during that lapse of time and flow of stream.

This takes care of a moderate amount of sewage in a community in a satisfactory way in communities that are not thickly settled and

in communities where there is an auxiliary water supply. It is of much more limited application in those communities that do not conform to these provisions.

Commonly we hear that if we are to properly conserve our resources, that there should go back on the soil everything that can possibly be returned thereto. As a basic principle that is right, but there are certain adaptations of this principle that commonly lead to erroneous ideas, and one of these is that American sewage is best disposed of by placing it on sewage farms.

There are certain parts of Europe where this is a paying process; but there are but few parts of this country where it is an economic method of sewage disposal.

The fundamental reason lies in this: our sewage is too dilute for economical use in this way. An American city commonly pumps more than 100 gallons of water per capita per day, and when sewage is diluted to that extent it is unprofitable to use for farm purposes.

Chicago pumps on an average 200 gallons of water per capita per day. Denver pumps more than 200; Colorado Springs more than 200. The average American city is in excess of 150, and there are American cities that run up to as high as 300 gallons of water per day.

There is no accurate method of estimating sewage outflow, but roughly speaking you can judge of the amount of sewage and the degree of dilution of sewage by the amount of water that is pumped. There are but few European cities that dilute their sewage with more than fifty gallons of water, and if we followed that rule it would be possible, perhaps, to have sewage farms in the United States.

Paris and Berlin are the only two cities that are making large use of this method, and Dunbar is of the opinion that it is not profitable in those cities, in spite of the concentration of their sewage, and in spite of the cheap labor—labor being largely a requisite in this method of sewage disposal.

Possibly there is one exception to that rule and that is this: that where sewage has not only fertilizer, but water value, it may be advisable and it may be economical to use polluted water—sewage and water mixed—rather than to make other disposal of the sewage.

On the other hand, those districts that are employing irrigation at the present time have soil that is stored with so much fertility that there is not any great necessity for fertilizer values in the irrigation which they make use of.

Water is also used in the disposal of garbage, and this, I believe, should not be allowed, and yet there are a few cities in this country that haul their waste—that is their garbage—out to the streams and there dump it, and have no other method of garbage disposal.

Other instances, other avenues for the pollution of streams, might be cited. But I think enough has been said to convince you that there should be made an intelligent study of stream pollution in this country, and that it should be controlled in such a way as to preserve the economics in their broadest relation.

Health officers are interested in the question of drainage for several reasons. They are interested in the question of drainage because it is a great aid in the great world fight against malaria. It is true that malaria depends for its spread upon people infected with malaria, upon mosquitoes capable of transmitting malaria, and upon people capable of developing malaria. There are at least two links in this chain that are closely related to the matter of soil drainage. The fight against malaria is going to be one, and it is going to be the next great fight that this country will win, and, winning, gain laurels for itself. The fight against yellow fever has been won; it is a memory, a memory of a work that for a century threw back a portion of this Union, held down the price of land, and made impossible the development of the commercial operations.

That is a memory. The next thing that is to pass from the realm of actuality into the realm of memory is to be malaria. This fight is to be won, and when it is won, our nation and its scientists, our nation and its peoples, are to be crowned with those laurels. But perhaps of greater consequence than that, is when this fight against malaria is won, the price of every acre of land in the southern half of this United States will increase at least 25 per cent. There will be greater resources; greater opportunity for local development, greater chance for the building up of strong, healthy and efficient men and women than has prevailed in our country to this time.

There are other relations between soil moisture and inefficient, unhealthy men and women, that ought to be dwelt upon, but I believe I have said enough to convince you that sanitarians and the people for whom sanitarians stand, namely, the great bulk of the people that stand asking for protection, and craving for greater physical power—that they are interested in the questions that are being discussed in this Irrigation Congress, and, let me add, this drainage Congress.

We are also interested in the question of irrigation, and for two reasons. It is quite generally accepted that the dry parts of this country are better for one disease than are the parts of the country where the humidity is greater, and that disease is consumption. There is no question of this. Whenever the percentage of air moisture, and as a corollary, of soil moisture, falls to a point where consumption bacteria do not develop, there we have an area where the consumptive has a maximum of chance for the regaining of his health.

But arid soil and dry air are not conservers of human life, energy and health along other lines. There are diseases that develop unduly well in areas that are arid. You escape some part of your disease burden when you convert your dry, arid districts, where there is no vegetation, into districts where there is a better balance between animal and vegetable life.

Then there is another reason, and that is this. No man can be a sanitarian, a hygienist, or a health officer and ponder different problems without seeing how closely they run into questions of social economics; without seeing how closely they are related to the earning capacity of men and to the cost of living, and anything that adds to the resources of this land to the end that there may be more money, provided there is an equal opportunity for the distribution of that money, makes directly for the health of the people.

There are areas on which rain does not fall, where since time began, the rocks have been crumbling, and those crumbling rocks have been yielding substances capable of development into foods for the people of this and other lands. Nature has conserved this storehouse, and so there for the ages there has been building up fertility unused. On the other hand, there are other areas in which stagnant waters stand, rotting vegetable matter, and in turn converting it into simpler chemical compounds, capable of being built up into food for man and those animals that serve man. And now there is a proposition to supply the soil that moisture that it needs, in order that these unused and hitherto unusable resources might be made available to supply moisture, and properly conserve mankind, causing the waste places to grow green with substances on which men can feed; to cause the swamps not only to be healthy, but to produce things that man needs.

As you succeed, there is an increasing probability that some of these problems of health, that tie so closely with the problems of financial welfare, will be more easily solved than in the years that are gone. (Applause.)

During Dr. Evans' address Second Vice-President L. Newman assumed the chair:

VICE-PRESIDENT NEWMAN: Ladies and Gentlemen: I have the honor to present to you a gentleman who needs no introduction, Dr. Harvey W. Wiley. (Applause.)

Address by

Dr. Harvey W. Wiley

Chief of the Bureau of Chemistry, Department of Agriculture

Mr. President, Members of the Congress: When I came in this morning and the time approached for the speaking to commence, I thought perhaps I might take advantage of the privilege accorded our legislators, and ask leave to print; and then after awhile I was reminded that this audience room looked very much like the Senate of the United States a year or two ago when Senator La Follette would get up to make a speech, except that there is no one in the galleries. (Laughter.)

But I have been inspired by the eloquence of Dr. Evans for clean water, even for irrigation purposes, and I want to add a word to what he has said in regard to the importance of keeping the sewage out of running streams.

We have in the running streams that are kept pure sources of food which ought not to be neglected, the fish, and the oysters, the shellfish along the coast, and these great beds of human food are becoming contaminated by the increasing impurity of the streams that enter the ocean, and the supply of the fresh water rivers is becoming lessened by reason of the impurity of the waters; and, as the extent of land which is put under culture is largely for the purpose of affording human food, we ought, in pursuit of that idea, to look to the conservation of the food products of which I have just spoken. So, in addition to sanitation, and in addition to the influence on the public health, there is the economic reason for disposing of the sewage in some other way than by turning it into the running streams.

I think that the great problem of an economic nature which presents itself to our country is that of food and clothing, and food and clothing are produced upon the farm. More than that, those areas of our country which nature has made suitable for agriculture are practically occupied, and we have got to change our methods of farming, which perhaps is a good thing to do, or we have got to get a larger area on which our farmers can go. The census has shown that people are leaving the agricultural areas in this country and going to the towns and the cities. The great agricultural states did not increase their population notably, that is, if they were old states, during the past ten years; but the old cities had the greater growth. Such cities as New York, Philadelphia and Chicago had a greater growth, perhaps, than ever before. This shows in the first place that we have more land than we can profitably occupy, because if you can make more money on the farm, that is where you would stay, and the people who leave the farm do not leave the farm because of the temptation of the city, as is sometimes held out to the farmer boy—and the more you talk about temptation, the more the boy wants to go—but it is because you make more money in the city than you can on the farm. That is the reason people go there.

We have not any too much money in this country, but it is badly distributed, or undistributed, probably, would be a better term. It accumulates in too few places. We have plenty of water in this country for all purposes, but, like the money, it is badly distributed. It ought to have better distribution. If we could squeeze the water out of Wall street, we could irrigate the whole wide land. (Laughter.) So it is distribution rather than supply that is the great economic problem.

Now, I want to say a few words here about the use of the land when you get it, and how it can be made more profitable. If I thought that the land of this country could never be made more productive than it is now, I would soon see a limit like Malthus did to the population of this country. We, perhaps, now are exporting a large quantity of food, but if we have no more areas to put under cultivation, and we cannot increase the production of what we have, we will not have much food to export in a few years. We are importing a great deal into this country as well as exporting. Of course the balance in trade in food products is still with us, but we are importing large quantities of food products into the United States, and the time will come if you increase the population, if it goes on as it is now, when you won't have much wheat any longer to export, nor much Indian corn. Suppose we adopt the proposition that seven hundred million bushels of wheat was about the average crop which we might expect from now on, would it be many years before there was no talk of boatloads of wheat for export affecting the markets of Chicago as they do to-day? If they get a big order for exportation, the price of grain goes up in this city and over the country, but it won't be long, if that is the limit, before there will be no boatloads of wheat leaving this country.

I don't know that that would be very bad. A country that sends out its blood must become anemic sometime, and wheat is the blood of the land, and corn is the blood of the land, and I would like to see them all eaten at home, if I had my way about it, and as much as possible of the waste returned to the soil.

I will tell you what products the country can send out and send out safely. They can send out cotton, because cotton is a gift of God and is not taken out of the soil. It is pure celluloid. You can send out sugar. That is another thing you can export with safety, and you can export fat, lard, or anything of that kind, or starch. I don't care how much of those things we export. Every boatload of those we send abroad adds to our wealth; but we cannot afford to send the phosphorus and the nitrogen which are in our wheat and in our meat to foreign countries, and the bone which goes with them. We must keep those things for our own use and restore them to the soil. The soil is a sensitive being. The soil is not dead, the soil is alive and deserves just as much attention from the farmer as any of his farm animals, and the farmer never thinks of the soil as being alive, but it is, and it requires just as much care and just as much feeding, and just as much currying as the horse does out in his stall, if he wants to treat it right. If a man wants to get the maximum work out of his horse, or his ox, he would not starve him, would not give him half rations, would not neglect currying him, he would treat him right, would not work him so long his shoulders got sore, no. He would be careful of that animal, because it is the good condition of him that makes him useful, and soil is just the same way.

One of the great things of irrigation is to me not so much that it adds another acre to the arable portion of our country, but as a rule it teaches the right principles of farming, because the man who spends one hundred dollars to get water onto his farm cannot farm it like the man who gets his farm for \$1.25 an acre. He has to make his interest on his investment, and the fixed charges for irrigated land are very much higher as a rule than those for ordinary agricultural lands. It is for that reason that the man who has an irrigated farm treats it right, he studies it, he recognizes it as having rights, and he supplies those rights, and therefore, one acre under irrigation, properly attended to, becomes an object lesson in farming, and the man who does not irrigate his land will sometimes profit by the man who does.

Now, soil is—this is a curious statement I am going to make, but

I am going to make it just the same—soil is the most unimportant thing to the farmer as a practical agriculturist. When the old philosopher was complimented on a great undertaking, he said, "Yes, and if I had a pousto, a place where I could stand, I could move the world." Soil is only the farmer's pousto, it is the place where he stands.

I can take you down into Florida and show you soil there, almost pure sand, yielding magnificent crops of citrus fruit, and I can go still farther and show you soils that are almost pure vegetable mold, where the water has been taken off of the swamps, producing rich crops. Neither one of those things is soil in the ordinary sense of the word. The ordinary farmer would tell you that you could not grow anything there, unless you treated it in a systematic and scientific way, so, I say the soil is the least important thing. You give a farmer a climate, and that means water, and he will grow anything and grow it well, so I don't ask whether those lands out in the West are rich—they have got the sunshine there, and when they get the water and the heat and the sunshine, the soil will be all right. If it is not, they will make it all right just as they have done in Florida and in other places in the world.

Another idea is that soil determines the character of the crop. That is another mistake. The character of a crop is determined by the other facts of the environment, and not by the soil. I will give you some illustrations. You take a great vineyard, for instance, some of the famous vineyards—you know them by name if you do not know them any other way. Take, for instance the famous Berne Castle vineyard on the Moselle river—the soil of that vineyard is exactly the same as the soil of the vineyards on both sides of it. What makes the product of this vineyard superior to that of others? Why, it is situated on the side of a hill which has a good exposure towards the southeast and gets the morning rays of the sun. It can get along without the afternoon rays if it can get an early start and do a good day's work, and the others are situated so that they get the sun in different directions; therefore, the wine which is produced in this vineyard, situated on exactly the same soil as those, is admittedly better than that, and is famous the world over.

The same is true of the great Burgundy vines of France. They lie on a hillside which the French call the Hill of Gold because of the richness of the crops, and you go right over the crest of that hill and on the other side, where the soil is exactly alike, there is not a vine grown. That range of hills runs from the northeast to the southwest, and those vineyards face southeast, and that is what makes that glorious wine in that region.

Go down into Virginia. You get the Albemarle Pippin. There are other lands in Virginia just like those on which the Albemarle Pippin grows, but there the Blue Ridge makes just such a curve as I have described in this range of hills in France, and thus we get the Albemarle Pippin.

The artificial distribution of water control is a most important factor in agriculture, the most important, because the man knows his crop in advance. He does not need to speculate about how much he is going to get this year. You take a farmer like I am, who depends upon rain. Now, I am not saying anything against the Lord, I don't wish you to think that I criticise him, but I sometimes complain of his action and so do you. The only man who does not is the poet, or philosopher, like James Whitcomb Riley—poor man, now ill, I fear, fatally—who says in a most philosophic strain:

"Tain't no use to grumble and complain.

It's just as cheap and easy to rejoice.

When God sorts out the weather and sends rain,

Why, rain's my choice."

But that is not the way with a lot of us. (Applause.) It was not the way with me last summer, when from the 23rd of April until the last day of May, I did not have rain enough on my farm in Virginia to lay the dust, and then, in August, we had eleven inches of rain when we did not need it particularly. The Lord made a mistake there like the little girl up in New York. They were going through an awful drought up there, and the pastures all gave out, and the milk supply failed—and that was a great industry up there—the production of milk,—and the churches all got together and prayed for rain; and the next morning the little girl read in the paper that nine inches of rain had fallen in Kansas City and caused that great flood. She said, "Is God a good geographer?" The mother said, "Why do you ask such an impious question as that?" She said, "we prayed for rain here yesterday, and then God had it in Kansas City." (Laughter.)

What we want is to distribute the rain, and the irrigated farm has that under control, hence the crop of the irrigated farmer is a fixed quantity depending on what he does to feed his crop, not depending upon how he gets this water. We do not understand quite the great function of water. We look at a plant and it is hard to realize that it has 75 per cent of water in it, or if it is a turnip, it has 95 per cent water. That is solid water. You would hardly think anybody could get water together and make it as hard as the turnip, and have it 95 per cent water. I do not know of a chemist under my immediate acquaintance that can do it, but the Lord can do it.

Take the ordinary little leaf, and the elements that it contains are the result of a chemistry beyond the ken of man, more perfect than that of the greatest chemist that ever lived, for God in this little leaf produces the structure of the plant.

The chlorophyll cell, so small that you would have to take a microscope to see it, and yet containing the most complete chemical laboratory that was ever built by man, producing these wonderful changes, storing the fiber which makes up the structure of the plant. Without water none of these actions could go on. Water is the fundamental element in plant life, not only for the structure, as I said, but for the current of life, the blood current of the plant.

When I was a boy I did not have a chance to study much geography down in southern Indiana where I was brought up, but once in a while I saw one and I would open it, and across all the territory west of the Mississippi River was marked "The Great American Desert" in letters four hundred miles long, if you measure them on the map, ranging entirely across this continent, where now exists to-day our most prosperous commonwealth.

Fifty years ago that was known as the Great American Desert and now we look to it for some of the greatest contributions to American wealth and to American statesmanship. That is what water has done.

Why, they say of old Senator Ben Wade, who was one of the commission appointed to accept the Union Pacific Railroad when they were finishing it, they were out there some place in what is now the state of Nevada, and the keeper of the little station there had found a spring, and he had brought it down and irrigated a little spot about ten feet square in front of his office, and there the flowers and grass grew in great profusion. He said to the Senator: "This is a great country, Senator. Look at this little spot here. All this country needs is water and good society." "Yes," said Senator Wade, "that is all Hell needs." (Laughter.) That was his reply to that. He had such a supreme contempt for the whole country that he did not think it was worth looking at.

Now, the farms and hamlets, and villages, and cities and wealth, and school-houses, and churches spread all over that great desert. That is what the beginning of irrigation has done for this country. What may we expect, friends, when it has completed its perfect work

and we have a densely populated area there, as we have through the east and center of the country?

Why, no one can foresee the power of this country to produce human food, and when I tell you that every acre that produces to-day thirteen bushels of wheat will in future produce three times that much, and every acre that to-day produces twenty-seven bushels of Indian corn in future will produce three times that amount; when I tell you that by more scientific methods we can increase the value of the corn crop five-fold, do you suppose we are going to starve in this country in the next thousand years or two thousand? That is all I am interested in, about a thousand years, as long as I expect to live. (Laughter.)

No, I am not afraid of starvation, nor my children, or their children if they have any. They are not afraid of starvation. The capacity of the human mouth to eat is a fixed quantity. We do not eat any more now than Adam did, and probably not as much, and yet the capacity of the human hand to make food is constantly increasing, and there are two hands and only one mouth. No, gentlemen, we are not going to starve. (Applause.)

MR. THOMAS KNIGHT, of Missouri: Before the reports of any of the committees are presented to the house, I have a motion I desire to put.

PRESIDENT FOWLER: You have the opportunity right now, sir.

MR. KNIGHT: I move that at subsequent meetings of the National Irrigation Congress, the official program shall provide specifically for a period of social intercourse, mutual introductions and general unrestricted exchange of opinion.

PRESIDENT FOWLER: Have you that motion in writing?

MR. KNIGHT: Yes.

PRESIDENT FOWLER: Send it up, please.

MR. KNIGHT: After the motion has been read, I wish to say a few words in regard to the motion.

President Fowler here read the motion to the Congress.

MR. KNIGHT: Mr. Chairman and Fellow Delegates, I am of the opinion, as an attendant upon the Congress from the first, that the good work that has been done has been done not altogether on account of routine work from the platform and the house, but by unrestricted interchange of opinion and social intercourse of the members themselves. In other words, that the active work has been generally done, the hard work preliminary to the good work on the platform, by the individual members arriving at some means of concerted action, and, therefore, wherever we find these names incorporated in our program, we have found the result to be very excellent, and it has been my impression that if we could provide an official place upon the program for that sort of unrestricted intercourse, it would be of great benefit to the Congress. Where some one of our delegates has come across the country forty or fifty miles by stage coach before reaching the railroad, he may wish to take off his coat before he argues the question, and he should be at perfect liberty to do it.

We have a few of the old members here, and some of our memories of the old days are most delightful, because they all ended in the accomplishment of our efforts. I remember many occasions when we met and got down to work in our shirt sleeves, and I expect to have to do it again. I hope that the motion meets with the approval of the house.

MISS SANFORD, of Connecticut: I have been a delegate from Connecticut for the last three terms, and in each instance there has been no place for the meeting of delegates. I can instance by telling you of a member of a delegation who told me he belonged to the Farmers'

National Congress in his state, and that he has had no opportunity to meet the delegates. I think it has been a little oversight. I think it would be well to provide that the old guard, those who have been in this work since its inception and who know everybody, have the duty of introducing delegates. I desire to amend the motion by adding that the old guards shall be considered the official introducers of all of the delegates.

PRESIDENT FOWLER: I desire to say that the sympathies of the Chairman are very strongly with the mover of this motion. I will go further than that and say that the sympathy of the Program Committee, who are responsible for the making up of the program, are also strongly with the mover of this motion. It was the plan to have had just such a meeting as has been referred to here. Now, there was a reception, you will remember, held here, which was strictly an informal reception, and was intended for the very purpose that I understand is the spirit of this motion. But there is quite a little history in connection with that meeting about which I need not go into in detail.

The motion is that at subsequent meetings of the National Irrigation Congress, the official program shall provide specifically for a period of social intercourse, mutual introductions and general unobstructed exchange of opinion.

Now, let me read to you from the Constitution before this motion is put. These are the rules: "After the adoption of the rules in open session, these rules shall remain in force throughout the Congress, but may be suspended or amended by a two-thirds vote."

The Constitution says: "This Constitution may be amended by a two-thirds vote of the Congress during any regular session, provided notice of the proposed amendment has been given from the Chair not less than one day or more than two days preceding; or by unanimous vote without such notice."

Now, the Chair would suggest it would be well to incorporate this into the Constitution. I believe in that proposition. What is the wish of the Congress?

JUDGE JOHN FAIRWEATHER, of California: I move that we suspend the Constitution, and that we insert that in the Constitution now.

PRESIDENT FOWLER: That will require a unanimous vote. Are you ready for the question?
Cries of "Question."

PRESIDENT FOWLER: All who are in favor of amending the Constitution as provided in this motion will signify by saying "aye."
The motion was carried unanimously.

PRESIDENT FOWLER: It is a unanimous vote and under the rules the Constitution is so amended.

AMENDMENT TO THE CONSTITUTION

Conforming to the above action of the Congress, the Constitution, as printed in the appendix, is amended by inserting in Article VI to form a new section the words: **Sec. 5. The program for each session shall provide for an evening reception or other meeting of social character adapted to the making of acquaintances and interchange of personal greetings.**

Article VI is further amended by changing the former "Sec. 5" to **Sec. 6.**

PRESIDENT FOWLER: We will next take up the matter of the report of the Committee on Resolutions, presented by Mr. Dwight B. Heard, of Arizona, Vice-Chairman of the Committee.

MEMBERS OF THE COMMITTEE ON RESOLUTIONS

The members of the Committee on Resolutions were:

Chairman	George H. Hutton.....	Los Angeles, Cal.	
Board of Governors	}	Dwight B. Heard.....	Phoenix, Ariz.
		E. F. Bohm.....	Cleveland, O.
Board of Control...	}	W. A. Evans.....	Chicago, Ill.
		W. L. Park.....	Chicago, Ill.
Arizona	Dwight B. Heard.....	Phoenix	
California	Frank Adams	Berkeley	
Colorado	John E. Field.....	Denver	
Connecticut	Miss Frida Sanford.....	Derby	
District of Columbia...	W J McGee.....	Washington	
Florida	Wilbur McCoy	Jacksonville	
Idaho	W. H. Redway.....	Caldwell	
Illinois	Frank B. Knight.....	Chicago	
Indiana	W. S. Roebuck.....	Ft. Wayne	
Kansas	R. H. Faxon.....	Garden City	
Michigan	F. R. Hathaway.....	Detroit	
Minnesota	Wm. Egeland.....	St. Paul	
Mississippi	L. E. Davis.....	Natchez	
Missouri	D. E. King.....	St. Louis	
Montana	W. A. Lamb.....	Helena	
Nebraska	D. D. Price.....	Lincoln	
Nevada	C. A. Norcross.....	Carson City	
New Mexico	R. E. Twitchell.....	Las Vegas	
New York	E. W. Catchpole.....	North Rose	
Ohio	W. H. Coles.....	Troy	
Oklahoma	Hugh Webster	Weatherford	
Oregon	Abel Ady.....	Klamath Falls	
Pennsylvania	George H. Maxwell.....	Pittsburgh	
South Carolina	Reid Whitford	Charleston	
South Dakota	W. H. Tompkins.....	Rapid City	
Tennessee	J. P. Wynn.....	Chattanooga	
Texas	Geo. Huffman.....	El Paso	
Utah	Caleb Tanner	Provo	
Vermont	J. H. Mead.....	West Rutland	
Washington	F. F. Holmes.....	Chicago, Ill.	
Wisconsin	J. A. Frear.....	Madison	
Wyoming	E. J. Sullivan.....	Cody	

REPORT OF THE COMMITTEE ON RESOLUTIONS

MR. DWIGHT B. HEARD, Vice-Chairman Resolution Committee: Mr. Chairman, Ladies and Gentlemen: The Committee on Resolutions has been in session for the largest portion of the last three days, and I am very glad to say that they concluded their labors last night at 12:30 o'clock, and that it resulted in the presentation of a unanimous report.

All of the resolutions presented were given careful attention. The work of the Committee for convenience was divided into sub-committees. These sub-committees reported and the general committee has examined the work of the various sub-committees, and has formed these resolutions which have been unanimously accepted, and which will now be read to you by the Secretary of the Committee, Mr. Faxon.

Mr. R. H. Faxon, Secretary of the Committee on Resolutions, read the following report:

RESOLUTIONS
of the
NINETEENTH NATIONAL IRRIGATION CONGRESS

We, the delegates of the Nineteenth National Irrigation Congress, now assembled in the City of Chicago, State of Illinois, on this ninth day of December, 1911, do hereby record our convictions concerning the great national questions to which this organization has for years devoted, and is now devoting, its best efforts through the ripest intelligence and highest moral sense of the individual Delegates and State Delegations representing the various states of the Union—these convictions being expressed in the following declaration of principles and affirmation of policies and opinions:

1. Recognizing the waters of the country as the source of life and the basis of the habitability and productivity of the land, we hold that the waters belong to the people of the country, and that this right of the people in and to the waters is natural, inherent, inalienable, and indefeasible. Recognizing the necessity for administering this invaluable possession of the people by State and Federal agencies, we deny the right of State or Federal government or municipal authorities to alienate or convey water by granting franchises for the use thereof in perpetuity, or without just compensation in the interest of the people.

2. Recognizing the interdependence of the various uses of the waters of the country, we hold that the primary uses are for drinking and domestic supply and for agriculture through irrigation or otherwise in which water is consumed, and that the uses for navigation and for power, in which water is not consumed, are secondary; and we hold that use of the water should be made with reference to all other uses for the public welfare in accordance with the principle of the greatest good to the greatest number for the longest time.

3. Accepting the fact that all parts of each drainage area are related and interdependent, we hold that each stream should be viewed and treated as a unit from the source to its mouth; and since the waters are essentially mobile and transitory, we hold that Federal control is essential to the equitable distribution and utilization of the waters of interstate streams.

4. Since the better utilization of our waters for water supply, irrigation, navigation, and power requires unification of the various administrative agencies of the Government having charge of the Federal regulation and control of water and waterways into a single agency, we request our representatives in the Federal Congress to take early action looking to the creation of an appropriate agency for this purpose; such agency to be empowered to co-operate with states.

5. Viewing purity of water supply as essential to the public health and general welfare, we urge on all municipal, State, and Federal authorities, and on individuals and corporations, constant vigilance and requisite action looking toward purifying and preventing contamination of the waters.

6. Recognizing the establishment of the United States Reclamation Service, largely through the efforts of this organization, as one of the

important steps in the development of this country as a home for a great and growing people, we heartily favor the continuation and extension of the service; and we reaffirm our full confidence in the integrity and capability of the officers of this branch of the public service.

7. We express to the Federal Congress appreciation of the provision made at the instance of this organization for a census of irrigation enterprises, and to the Director of the Census hearty appreciation of the manner in which the work was carried out and reported at the Pueblo and Chicago sessions; and we recommend to the Federal Congress and to the Secretary of Commerce and Labor that provision for a similar census of irrigation be incorporated in the law providing for the agricultural census of 1915.

8. Adhering to the principle of local self-government, we urge co-operation and organization for mutual benefit among irrigators, and advocate provision for irrigation districts by the legislatures of all States in which irrigation is practiced.

9. We recommend an amendment to Section 4 of the Reclamation Act, approved June 17, 1902, such amendment to provide for repaying the cost of any project by the land-owners under it in installments covering a period of not less than twenty years; these installments to be in equal or graduated amounts payable at such time or times as may be determined by the Secretary of the Interior.

10. We hold that homestead entrymen on lands to be irrigated under any reclamation project should receive patents on making final proof on payment of such portion of the charges apportioned against such tracts as may then be due, under regulations safeguarding the collection of the remaining charges apportioned against such entries.

11. Holding that a full understanding of the plans, progress, and cost of irrigation works on the part of Water Users' Associations will promote good-will and harmony between the representatives of the Government and the Water Users, we recommend that hereafter complete plans and specifications of any work contemplated on any project shall be delivered to the project Water Users' Association before the work begins; we further recommend that itemized semi-annual reports of all charges and expenditures under any irrigation project shall be furnished to the officers of the Water Users' Association under such project.

12. We favor such administration of the Reclamation Act as shall provide that before any contract for the sale of power developed by any reclamation project is made, it shall first be submitted to and approved by the officers of the Water Users' Association under such project.

13. We hold that adequate provision should be made for the disposition of seepage and waste waters in irrigable areas under reclamation projects.

14. Viewing adequate and economical transportation facilities as among the great and growing needs of the irrigable region, we approve the development of navigation throughout the rivers and lakes of the United States in accordance with a comprehensive plan extending to the natural waterways and the necessary canals in the order of their magnitude and commercial importance.

15. We endorse and commend the Newlands Bill (S. 122) to create a Board of River Regulation, and urge every delegate to this Congress to co-operate in all possible ways to aid in securing its enactment by the Federal Congress during the present session.

16. We favor the preservation and development of our national resources by the construction of storage reservoirs by the Federal Government for flood protection, and to save for use in aid of navigation and irrigation the flood waters which now run to waste and cause overflow and destruction.

17. Recognizing the close natural connection between forests and stream-flow, especially throughout the irrigable region, we heartily com-

mend the Federal forest policy and favor its continuance and extension; and we reaffirm our full confidence in the high integrity and exceptional intelligence of the past and present officers of the United States Forest Service.

18. Approving the progressive withdrawal of lands suitable for homesteads from the National forests, we hold that such withdrawals should be made in the light of expert investigation showing that the agricultural value of such lands is paramount to their value both for forest production and for stream protection.

19. We favor the enactment by all States of laws to regulate the cutting of timber on State and Private lands, and laws reforming taxation on timber lands, cut-over lands, and reforested lands, to the end that the perpetuity of the forests may be assured and the flow of the streams be preserved.

20. We approve, and direct our Senators and Representatives in the Federal Congress to support the Burke Bill (H. R. 14085) reappropriating and rendering available the lapsed portion of the sum appropriated to provide for the Appalachian and White Mountain Forest Reserves in accordance with previous recommendations of the National Irrigation Congress.

21. It is the sense of this Congress that in the Federal control essential to the equitable utilization and distribution of interstate streams, recognition must be given to the rights of all citizens who have effected valid rights of appropriation.

22. We commend the work of the United States Geological Survey, and strongly recommend that more liberal appropriations be made by the Federal Congress and the legislatures of the States for co-operation in the prosecution of the work of the topographic and water-resources branches of this bureau, including stream measurement.

23. We are firmly convinced that States should exercise thorough and effective, and not merely nominal and perfunctory, supervision over irrigation districts and Carey Act projects, to the end that investors in their securities may have proper assurance of their worth or due notice of their unsoundness. We also urge all Governors and State Legislatures to require public recording of all irrigation enterprises, with accompanying sworn statements as to the priority and amount of water rights, sufficiency of water supply, total area and general quality of lands, quantity of water guaranteed, drainage works provided, and the financial ability of the owners, promoters, and sellers of irrigated land and water rights to fulfill their promises to purchasers; and we hold that the States should provide for examination, under public authority, of all projects recorded, and that reports of such examinations should be kept on file readily and easily accessible to prospective purchasers. We also urge the Postmaster-General to supervise advertising matter in the press, and to issue fraud orders prohibiting the circulation through the mails of newspapers advertising unsound irrigation projects and enterprises.

24. With the view of throwing the weight of the influence of this body against prevalent abuses in the sale of water rights, land, and irrigation securities of the Western States, we recommend that the Board of Governors be authorized to appoint a standing committee to investigate such abuses and the best means of eradicating them; such committee to be empowered to secure and disburse in the name of the National Irrigation Congress any funds needed in the prosecution of its work.

25. Realizing that the greatest benefits of foreign immigration can be attained only when the immigrants settle permanently on farms, where they quickly develop the spirit of citizenship and help to render this a nation of homes, we commend co-operation among the various state immigration officers and the establishment of common agencies, including expositions and other means of diffusing accurate information,

to the end that immigrants may be located on the soil under conditions appropriate to their habits and to the best development of the country as a whole.

26. Impressed by the wisdom of the founders of this nation, who aimed to develop a great people made up of independent land-holding and home-owning families, and realizing that the early standards have largely fallen into neglect so that our population is chiefly urban and wage-earning, we are in sympathy with the recent movement back to the farm; we deplore the holding or controlling of land, or of the water which renders it fruitful, for speculative objects or for other purposes than the making of homes and the maintenance of a strong and vigorous population; and we urge on States and the Federal Government the desirability of framing legislation favorable to home-making, family development, and the industries of primary production rather than the interests of the secondary industries of manufacturing, transportation, merchandising, banking, and other commercial activities.

27. The National Irrigation Congress, hearing the cry of the people for homes, and for the restoration of individual hope and prospect, hereby calls the States and the Nation to lead the people back to the land; it urges the creation of a bureau of rural settlements to organize communities not only on the reclaimed areas of the West and South but on vacant land surrounding centers of population. We declare that there is no more wonderful fact than this: that an industrious man can make a living for his family on a very little land. Leadership, organization, instruction, and, in many cases, the loan of credit or capital, are necessary; but all these are within reach of the people through the State and Federal Governments.

28. Holding that the inclusion of public lands in irrigation districts organized under State irrigation district laws will beneficially extend the operations of such districts and materially aid in the reclamation of arid lands, we recommend to the Congress of the United States the enactment of a law authorizing the inclusion of such lands within such districts, with all the rights, liabilities, and exemptions of lands in private ownership, under proper safeguards of the rights of the United States in its public lands.

29. We recommend that the Attorney-General of the United States be asked to make a systematic compilation of the irrigation laws of the various States and to secure the publication thereof for public distribution; and we urge that the respective legislatures of the various States enact uniform laws relating to irrigation and to other uses of the waters connected with irrigation.

30. We commend the irrigation and drainage investigations of the Office of Experiment Stations, the soil and water investigations of the Bureau of Soils, and the dry-farming investigations of the United States Department of Agriculture, and equally commend the work of the Agricultural Experiment Stations and Engineering Departments in the several states; we favor further investigation of natural sub-irrigation and of irrigation by pumping; and we urge more liberal appropriation by the Federal Congress and by the States for the work and co-operation of these agencies, and for the more general distribution of the reports and bulletins recording their operations and results.

31. Since there are in the United States some 75,000,000 acres of swamp and overflow lands virtually unoccupied; since the drainage of these lands will promote the public health, render a vast area available for agriculture, materially aid navigation, and add greatly to the wealth of the nation; and since the reclamation of these lands is a public duty affecting the general welfare, we urge the Federal Congress to enact such laws as may be necessary to reclaim and make useful the swamp and overflow lands and insure their highest development; and we especially recommend the creation of a national commission to make the necessary surveys, estimates of cost, and plans for such reclamation

in co-operation with individuals, communities, corporations, and States.

32. Since drainage ditches or canals used in connection with irrigated lands greatly enhance productivity, we strongly urge Governors and State Legislatures to provide for such drainage districts as may be required for the best development of sections in which this form of water control is necessary.

33. It is the sense of this Congress that Federal and State departments in charge of reclamation and conservation work should make accessible to the press the legitimate news of such departments as their work develops, to the end that the people may be informed rapidly and widely as possible on these important subjects.

34. Since the Dry Farming Congress is working in the interest of scientific soil tillage and conservation of moisture in order to reclaim all possible arid land by saving and utilizing all the available water, this Congress extends hearty wishes for the success of that organization, with the assurance that we appreciate the value of every step that will in any way result in placing a greater area of land under cultivation.

35. Since the expert knowledge of officers of the Reclamation Service has in the past been invaluable to the Congress at large, and especially to the Resolutions Committee, we recommend that the Secretary of the Interior be requested to detail the Director of that Service, and such other officers thereof as may in his judgment be competent, to attend all sessions of the Congress and hold themselves in readiness to give necessary information of public character to the Resolutions Committee.

RESOLVED, That the Nineteenth National Irrigation Congress proffers its sincere thanks to the State of Illinois and the City of Chicago, including both citizens and the commercial and other organizations, for the hearty welcome and generous hospitality enjoyed by the members of this Congress. We especially thank Governor Charles S. Deneen and Mayor Carter H. Harrison for their interest in these proceedings.

We express hearty appreciation and thanks to the Governments represented at this Congress by foreign delegates, including Australia, Canada, Costa Rica, Germany, Guatemala, Italy, Nicaragua, Peru, Russia, and Scotland.

Inasmuch as the official proceedings of this Congress, the publication of which is naturally delayed, furnish the only medium of expression on the part of the Congress, we thank the press of the various states for liberal space given the work of preparation for the Congress and to its sessions.

We commend B. A. Fowler for his efficient work as President and his able and impartial conduct in the chair; and we commend Arthur Hooker for his untiring services as Secretary of the Congress.

We commend the Board of Control for its efforts in behalf of a successful Congress.

Respectfully submitted,

(Signed)

GEORGE H. HUTTON, Chairman.
DWIGHT B. HEARD, Vice-Chairman.
R. H. FAXON, Secretary.

During the reading of the report the following occurred

MR. GEORGE H. MAXWELL: May I suggest a change, so as to read "Newlands River Regulation Bill," to properly identify the bill?

PRESIDENT FOWLER: A clerical oversight I presume and I am very sure that if any delegate desires to have it corrected, it will be corrected according to the suggestion.

MR. FAXON: It would, perhaps, be better to read it through as it is.

PRESIDENT FOWLER: The suggestion is made by Mr. Faxon that he had better read it through as it is. Then we will understand these verbal changes which are suggested will be made in the report itself.

MR. HEARD: Mr. Chairman—before moving on behalf of the Committee, the adoption of this report—the point was raised regarding resolution 15, this refers to the Newlands bill, and immediately says, "Board of Regulation," thereafter. This point was raised by Mr. Maxwell, and if he prefers it, it would be entirely agreeable to make it Newlands Regulation Bill, although I think the object of the Committee is covered clearly in the resolution.

MR. MAXWELL: I think it is plain as it is, but this, perhaps, makes it a little more clear.

MR. HEARD: In view of the great effort you have given to it, we would be inclined to make it Newlands Regulation Bill, but I think it is absolutely clearly stated in the resolution.

MR. MAXWELL: I will leave it entirely to you.

MR. HEARD: I think it is perfectly plain as it is.

Now, Mr. Chairman and Gentlemen of the Convention, on behalf of the Committee on Resolutions, I move the adoption of the unanimous report of the Committee on Resolutions.

The motion was duly seconded.

MR. A. A. JONES, New Mexico: Mr. President, Ladies and Gentlemen: I cannot permit myself to vote for the passage of those resolutions without calling to the especial attention of the delegates one of the provisions which I heard read, and which, I believe, has not been fully considered by the members of this Congress. It is my opinion that one particular resolution involves a fundamental principle of government which has not been carefully considered by the Committee on Resolutions or by the delegates to this Congress. There is a resolution there which provides that all irrigation enterprises shall be supervised by some official of the state government. I do not recall the number of the resolution. I knew nothing of it until I heard it read a few moments ago, but if you will consider for a moment that involves a fundamental principle of government which I do not believe has had the consideration which it deserves from the delegates to this Congress.

We may talk about supervision of irrigation enterprises, and it looks upon the surface as if it is a good thing. That evils exist in the promotion of irrigation enterprises, there can be no doubt. That something should be done, there can be no doubt; but do you want to entrust to an official the supervision of all these irrigation enterprises? Something should be done so that the people of this country cannot be imposed upon. It is one of the greatest dangers, it is one of the great detriments of irrigation at the present time. That there are so-called wild-cat schemes, there is no question. That they should be suppressed, there is no question. That all of these enterprises should be absolutely legitimate and well founded, there is no question, but is this the solution of the problem?

When you begin to supervise irrigation projects, will you stop there? What about your mining projects; what about your railroad projects, and all other activities? If the government is to supervise the one, should it not supervise the other? Do you want at this time to commit this Congress in such an unconsidered way to such a fundamental principle? A few days ago in the Sherman House, a number were called in there to consider the establishment of a permanent land exhibit here in the city of Chicago. Great complaint was made at that time about these enterprises, how the public was being imposed upon, but what is the solution? Have we had time to solve this great

problem? Do we want now without discussion from anyone to commit ourselves to such a doctrine? Something should be done I admit, and urge and I think that this Congress can do no greater service to the people of this country than to devise some ways and means whereby the people should not be imposed upon by propositions of this kind which are not absolutely sound. But is this the method? I submit to the delegates that this is a question which deserves extreme and careful consideration. I do not believe that this is the way to do it. Back in one of the western states in the early history of the irrigation legislation, it was provided that a state engineer should determine the question as to the best use of water, or rather the use of water which was in the public interest. After the engineer had undertaken to exercise that function for only one short year the whole people of the state were so dissatisfied, that the next legislature repudiated it. They did not want to put such extreme power in the hands of any one man, and is not that the question which we are raising here? Do you want to put such power as this in the hands of a state official?

From the expressions that I have heard while in attendance upon this convention, I am quite convinced that there are some people here, at least, who are not satisfied with the administration of the reclamation projects by government officials. (Applause.) You know the evils with which you have been contending, and are you willing to put into the hands of officials, not only the administration of enterprises, but absolutely the financial, colonization, and other interests connected with these enterprises? I warn you, my fellow delegates, to give more consideration to such a fundamental principle before you commit yourselves to it, and I, therefore, move you that that particular resolution be referred to the next Congress for its consideration.

The motion was duly seconded.

MR. H. L. MOODY, of Washington: I want to add my mite to what Mr. Jones of New Mexico has said in relation to that matter, and I do hope that this Congress will not go on record at this time in a matter of this vital importance without having given it full, complete and careful consideration. That the administration of the government projects is not satisfactory, that they are not what they should be, is admitted by every man who has inside knowledge of their operation, at least, I believe so, and especially where they come in contact, or close association with those private enterprises which have been in operation from ten to thirty years. I know one government project that has now through its Water Users' Association started law suits against nearly four hundred settlers, members of local irrigation companies that have been using water from ten to thirty years.

There are things being done under the Reclamation Act which would make your blood boil if you knew it, that would make you want to fight as it does those who are being punished and persecuted. I am not speaking as one that does not know what he is talking about, because I have been upon the ground and I know whereof I speak, Mr. Chairman, and, therefore, I heartily support the amendment offered by Mr. Jones of New Mexico, and ask you that this matter be deferred, studied and considered until the time of the next Congress, which will undoubtedly be attended by a large number of men who are interested and who understand this problem thoroughly. (Applause.)

DR. W J MCGEE, of Washington, D. C.: At the request of the Chairman of the Committee on Resolutions I beg the indulgence of the Congress long enough to read the resolution, and I shall endeavor to read it in such a manner as to make its purport clear. This is paragraph 23.

"23. We are firmly convinced that States should exercise thorough and effective, and not merely nominal and perfunctory, supervision over irrigation districts and Carey Act projects, to the end that in-

vestors in their securities may have proper assurance of their worth or due notice of their unsoundness. We also urge all Governors and State Legislatures to require public recording of all irrigation enterprises, with accompanying sworn statements as to the priority and amount of water rights, sufficiency of water supply, total area and general quality of lands, quantity of water guaranteed, drainage works provided, and the financial ability of the owners, promoters, and sellers of irrigated land and water rights to fulfill their promises to purchasers; and we hold that the States should provide for examination, under public authority, of all projects recorded, and that reports of such examinations should be kept on file readily and easily accessible to prospective purchasers. We also urge the Postmaster-General to supervise advertising matter in the press, and to issue fraud orders prohibiting the circulation through the mails of newspapers advertising unsound irrigation projects and enterprises."

Now, Mr. President, I should like to proceed with a few words of explanation concerning this paragraph. In the first place let me explain that this paragraph was drafted by the Sub-Committee on the lines of the entire Resolutions Committee, the Chairman whereof was Professor Adams of California, who unfortunately is not here to explain the purpose of the resolution, and I do so with some hesitation, since I cannot, of course, speak with that degree of authority and that degree of knowledge in detail which is possessed by the Chairman of the Committee. But what I desire to emphasize is this, that this entire resolution pertains to what in a broad sense we call private irrigation, or irrigation by private enterprise. It does not in any manner touch on the work of the Reclamation Service. It is not addressed to the Federal Government in any manner whatsoever, but altogether to the states, and the desire of the committee was to render that perfectly clear by the language of the resolution.

A word as to the reason for the framing of the resolution at this particular time. It will be remembered that when the Congress decided at Pueblo to come to Chicago, the principal motive was to secure the fuller consideration that it was supposed might be given elsewhere to the whole subject of irrigation securities, the object being to render irrigation securities, and especially irrigation securities growing out of the kind of enterprises that were springing up in the different states—to have the whole subject of irrigation securities fully considered.

Over and over again since this Congress assembled in Chicago that matter has received attention, the question as to irrigation securities. Moreover from different directions, the resolutions committee were urged to bring in a vigorous and emphatic protest, if you please, against the unsound enterprises that are extensively advertised all over the country, and which within the last two and three years, as I think all of us know, have come to put irrigation enterprises in a class precisely parallel to that of wild-cat mining schemes of ten and thirty years ago. In other words, the whole subject of regulation by the states of the irrigation enterprises within them seems to many of the delegates in this Congress to be of very serious consequence.

Mr. Chairman, that is all that I want to say, merely to emphasize the fact, first, that this resolution is addressed wholly to states, and applicable wholly to private irrigation enterprises. Second, that it is framed in response to the strongest pressure brought to bear on the Resolutions Committee during the Chicago session of the National Irrigation Congress; having explained which I desire only to add that if the delegates to this Congress do not desire to put themselves unqualifiedly on record as opposing spurious, unsound, rotten, wild-cat irrigation enterprises, then our best course will be to strike this resolution out.

MR. GEO. E. BARSTOW, of Texas: I wanted to have that resolu-

tion read, Mr. President, because I believed that there was some misapprehension. After it is re-read, I am more convinced of that fact. I fail to understand what this has to do with the Reclamation Service in any way, shape or form. As Dr. McGee has explained, the purpose of this resolution is to make a strong drive against that element that has been steadily at work for the past two or three years all over the irrigation country to do the things that are unjust and unfair toward the people of those states and toward the people of the country. I believe, sir, that this Congress desires to go on record emphatically against that sort of enterprises, and it seems to me that my good friend, Mr. Jones of New Mexico, has also misapprehended the intent of this resolution. It has nothing to do with the Reclamation Service. It has nothing to do except to give testimony here in the strongest way that this Congress is absolutely against wild-cat operation in irrigation, and I hope, gentlemen, that we will pass that resolution. (Applause.)

MR. JONES, of New Mexico: Mr. President, I was exceedingly unfortunate if I impressed you all as I apparently impressed the gentleman on the platform and my good friend to my right. I only referred to the reclamation projects as an illustration of the seriousness of public officials administering these enterprises. The main point is that this resolution undertakes to supervise the promotion of enterprises. It wants to censor the literature which may go out to the public. That is a remedy provided here for the attempted evil. No one can express himself more firmly than I that there are outrages committed upon the public under the name of irrigation. That something should be done, there is no doubt, but is this the thing to do? Do you want to supervise, through a horde of government officials, the promotion of irrigation enterprises? Are you willing to commit yourself to such a fundamental principle of government after a consideration for a mere three days? Can you work out these problems in that length of time? I say to you, my fellow delegates, this is an important matter and one with which we must deal, but how it is to be done I am not prepared to commit myself at this time to that sort of a solution.

MR. A. R. SPRAGUE, of California: Mr. President, the gentleman has conceded that something is exceedingly necessary to be done. He has not suggested any means of doing it. I think it is not within the power of any of us to suggest a more conservative means of accomplishing this result than by referring the matter to the several states interested, desiring some sort of state supervision, because the state is the representative of the people. There is no other means of getting it except from the state. The resolution has not provided any particular way in which the state shall do that. It has not set forth that the supervisors are to be appointed or elected, who shall exercise arbitrary power over these matters? Certainly not. It simply refers the request, in view of the thousands of those who are suffering now from the ill reputation of irrigation districts that have earned an ill reputation—I say this in behalf of those irrigation districts that are meritorious projects—that some action is necessary at this time.

The gentleman forgets what has been clearly stated by the Committee on Resolutions, that this has been under consideration for more than a year. It was a matter of great concern at the Pueblo meeting, and the reason for meeting here in Chicago is indicated in connection therewith. Now, certainly a request for some supervision in a matter affecting so large a question as this is not revolutionary or extreme in any manner whatever. We are now exercising supervision over railroads, over many forms of manufacture in the interests of health. Supervision by the commonwealth, by the state, is a matter well established, and it seems to me we can safely vote for the adoption

of this resolution. We shall do very much more harm if we refuse to adopt it than if we give it our hearty approval. (Applause.)

MR. GEORGE H. MAXWELL, of California: Mr. Chairman, I wish to say that so far as this subject having been given consideration is concerned, I have been considering it for about twenty years and I know of only two remedies. One is that suggested by this resolution; the other is the absolute and complete adoption of the Australian Land Settlement system, which we were told about yesterday by Mr. Nielsen. (Applause.) I prefer the latter, but the American people will have to be educated up to it. If this experiment of state supervision or control succeeds, we may never need a complete system of state colonization. If it fails, then we are up to the last resort, which is the Australian Land Settlement System.

Advocates as well as opponents of government ownership must realize that the system of national or state regulation and control of private business is only a bridge across which we will travel to entire and absolute government ownership. (Applause.) To contend that the regulation of railroads by the national government is a safeguard against government ownership is a blundering misconception of the ultimate trend of events. That, perhaps, is not the proposition here, but it illustrates the idea.

There are the two remedies that I have suggested for this evil of fraudulent or criminally careless methods of colonization that swept over the west twenty years ago, and which is now in my judgment about to break out again. When it swept over the West before it left ruined hopes and ruined homes. I believe we are facing another era of that kind, and I believe the fact that in the great city of Chicago you can fill the Coliseum with possible victims, and you cannot fill this hall with people who are honestly trying to remedy the evil, illustrates the fact that we must have some remedy. (Applause.)

Now, I voted for that resolution in the Committee without saying a word, but with a full realization of its importance. I am willing to try the experiment of state supervision. If it fails, then let us have the Australian Land Settlement System, and be done with it. In the meantime I know of no other way but to try the system of state supervision. In my judgment—I may be wrong, I do not want anybody to vote on my judgment on that point—in my judgment it may be that there are some states where the state officials will be unreasonably arbitrary or actually dishonest, and that the state officers will impede the development of that state by their improper or unreasonable exercise of this power; but if that happens, are not the people of that state going to wake up pretty soon and correct that evil?

In the last analysis of the evolution of this system, is it not going to work out this way: that the honest project, that courts investigation, is going to be able to get a "Certificate of Character" that will enable it to do business in competition with the dishonest concern that is willing to promise anything in order to get a few dollars out of unsuspecting victims? (Applause.) They used to think out West that they could irrigate with promises and printers' ink, but after they had tried it for ten or fifteen years and wrecked whole communities by that sort of a system, they found it took water to irrigate. I think if we try this system of state supervision, that it will work in some states anyway, and if it doesn't work in others, that those states will have to find some other remedy, and in the states where it does work you have found the remedy.

I believe that in the long run we are coming to the Australian Land Settlement System anyway, and I want to go on record now with the expression of that belief as a prophecy. (Applause.)

PRESIDENT FOWLER: The Chairman of the Executive Committee has an announcement which he wishes to make.

CHAIRMAN INSINGER: I do not want to urge closure of a debate as interesting as this debate is, but I have to remind the delegates of this unfortunate fact, that at half past twelve the lights will go out, and we have besides the report of the Committee on Resolutions, the report of the Committee on Permanent Organization, and we must make up our minds to one thing or another. We will either have to close this debate, or we will have to get another room somewhere and continue this session.

PRESIDENT FOWLER: The Chair would like to emphasize the announcement that the Chairman of the Executive Committee has made to this extent. The contract made by the Board of Control with the proprietors of this Auditorium was to the effect that, inasmuch as there was to be a matinee this afternoon, that this hall should be vacated by the Irrigation Congress at 12:30 precisely, so you have your limit in this building, as the chairman of the Executive Committee has said.

MR. H. L. MOODY, of Washington: Mr. Chairman, I want to say that I stand for the strictest regulation of the whole stock jobbing proposition. There is not a man or woman in this hall or in this city that has any cleaner record than I have—and I appeal to my colleagues, my home delegates who have known me for twenty-five years—and I refute the insinuation from the platform, gentlemen, that if we do not want such regulation, there is something wrong. I say that we stand on a broader ground than this resolution, and we stand on a broader ground than has been stated in that resolution, and I know that I am voicing the sentiment of Mr. Jones and a good many others in making that statement.

I heard the speech of the gentleman from Wisconsin who came down here and made a rattling good speech along the same line, but he had to take a slam at Canada, and thereby spoiled the efficiency of his whole address. We stand for the efficient regulation, not of irrigation enterprises alone, but of corporations in general, and if this Resolutions Committee had had the foresight to have brought in before you a proper resolution on the regulation of corporations, the issuing of stock of all kinds, of industrial matters, instead of taking a side stroke at the irrigation business—

The gentleman was here interrupted by calls for the question.

PRESIDENT FOWLER: The gentleman still has the floor.

MR. MOODY: I say that if you pass this resolution, you will make a mistake.

A DELEGATE: Mr. President, I move the previous question. The motion was duly seconded.

PRESIDENT FOWLER: Gentleman, this motion is not debatable and it must be carried, if at all, by a two-thirds vote.

The motion for the previous question prevailed, and the question was called for.

MR. JONES, of New Mexico: Mr. Chairman, I just want to state as a special privilege, that I hope no one has misunderstood me to the point of believing that I do not think something should be done to suppress these wild-cat irrigation schemes. I am deeply interested in that myself. I only thought that by putting this over until the next Congress you will get more consideration of this question than by adopting this resolution at this time.

The question was again called for and Mr. Jones' motion was defeated.

MR. ALBERT B. BARTLETT, of Wyoming: Mr. President, I object to the endorsement of the resolution referring to the commendation of the policy of the Forest Service.

A DELEGATE: Point of order, Mr. Chairman.

PRESIDENT FOWLER: State your point of order.

THE DELEGATE: The previous question has been called for, which takes us back, as I understand it, to our original motion.

PRESIDENT FOWLER: The Chair could not rule that way. The previous question referred to the amendment.

MR. BARTLETT: The injury inflicted upon the Western States by the action of the Forest Service, and by the general policy of government landlordism and the withdrawal of public lands, is so monumental that I hardly know where to begin to express these conditions. I have been a resident of the Western States for the past quarter of a century, and have been actually on the ground among the people, the pioneers of the West, who are the actual real settlers who try to build up the country, who attempt to make homes upon the lands and make a powerful, prosperous nation.

A DELEGATE: Another point of order. There is no motion before the house now to debate. I move the previous question.

The motion was duly seconded and carried.

PRESIDENT FOWLER: The question now before the house is the adoption of the report of the Committee.

The motion prevailed.

PRESIDENT FOWLER: The report of the Committee on Resolutions is adopted. (Applause.)

MEMBERS OF THE COMMITTEE ON PERMANENT ORGANIZATION

The members of the Committee on Permanent Organization were:

Chairman	J. B. Case.....	Abilene, Kans.
Board of Governors. }	W. G. DeCelle.....	Chicago, Ill.
	John Fairweather.....	Fresno, Calif.
Board of Control... }	R. R. McCormick.....	Chicago, Ill.
	Edmund T. Perkins.....	Chicago, Ill.
Arizona	A. J. Chandler.....	Mesa
California	John Fairweather	Fresno
Colorado	Kurt Grunwald	Pueblo
Connecticut	Miss Frida Sanford.....	Derby
District of Columbia....	W J McGee.....	Washington
Florida	H. P. Porter.....	Jacksonville
Idaho	E. C. Crocker.....	Boise
Illinois	John D. Hibbard.....	Chicago
Indiana	Will Blair	Princeton
Iowa	M. F. P. Costelloe.....	Ames
Kansas	A. D. Walker.....	Holton
Minnesota	Oliver D. Hefner.....	Minneapolis
Mississippi	L. L. Lawrence.....	Laurel
Missouri	Fred W. Fleming.....	Kansas City
Montana	S. B. Robbins.....	Great Falls
Nebraska	C. A. Black.....	Omaha
Nevada	Fulton H. Sears.....	Fallon
New Mexico	Forrest McKinley.....	Las Cruces
Ohio	E. F. Bohm.....	Cleveland

Oklahoma	W. G. Vandever.....	Blackwell
Oregon	M. C. George.....	Portland
Pennsylvania	George H. Maxwell.....	Pittsburgh
South Carolina	A. W. McKeand.....	Charleston
South Dakota	S. H. Lea.....	Pierre
Tennessee	L. P. Bellah.....	Nashville
Texas	J. A. Smith.....	El Paso
Utah	German E. Ellsworth.....	Chicago, Ill.
Vermont	H. B. Ward.....	St. Johnsbury
Washington	H. L. Moody.....	Spokane
Wisconsin	A. J. Cobban.....	Madison
Wyoming	Chas. Mason	Wheatland

**REPORT OF THE
COMMITTEE ON PERMANENT ORGANIZATION**

PRESIDENT FOWLER: We now come to the report of the Committee on Permanent Organization. This report will be read by Mr. J. B. Case, of Abilene, Kansas, Chairman of the Committee.

Chicago, Ill., Dec. 7, 1911.

To the Officers and Members of the Nineteenth National Irrigation Congress:

We, your Committee on Permanent Organization, beg to report as follows:

That we have unanimously nominated the following officers of the National Irrigation Congress for the year 1912:

- HON. FRANCIS G. NEWLANDS.....President
United States Senator, Reno, Nevada.
- HON. ARTHUR HOOKER.....Secretary
Spokane, Washington.
- DR. E. McQUEEN GRAY.....Foreign Secretary
Albuquerque, New Mexico.
- HON. R. INSINGER.....First Vice President
Spokane, Washington.
- HON. J. B. CASE.....Second Vice President
Abilene, Kansas.
- HON. JOHN FAIRWEATHER.....Third Vice President
Fresno, California.
- HON. S. H. LEA.....Fourth Vice President
Pierre, South Dakota.
- HON. RICHARD F. BURGESS.....Fifth Vice President
El Paso, Texas.

The following named places made application for the meeting of the next session of the Congress: Houston, Texas; Charleston, S. C.; Seattle, Wash.; Salt Lake City, Utah; and Pittsburgh, Pa. Upon discussion, all the other cities withdrew in favor of Salt Lake City, Utah.

A pledge of \$7500 to the National Officers for the conduct of the Twentieth Congress was made, with the understanding that this money is to be paid directly to the National Officers, and that, if necessary, it will be increased to the sum of \$15,000 upon request of the National Officers.

(Signed)

J. B. CASE, Chairman.
KURT GRUNWALD, Secretary.

CHAIRMAN CASE: I move you, Mr. President, the adoption of the report of the Permanent Organization Committee.

The motion was duly seconded and carried.

MR. H. L. MOODY, of Washington: Mr. Chairman, I would like to make a motion before we adjourn. I move you that we recommend to the Board of Governors and the officers of the next Congress that the report of the Committee on Resolutions be handed in at least one day prior to the time of adjournment, in order that those resolutions may have an opportunity to be fully discussed without being cut off prematurely.

The motion was duly seconded.

MR. CALEB TANNER, of Utah: Mr. President, that will work so as to exclude a great many resolutions from consideration. By following the proceeding we have adopted heretofore, we have been able to get a great many resolutions, to work upon them, digest them and bring them before this Congress. It is hardly reasonable that we cannot have all of the discussion that the gentleman from Oregon wants in Salt Lake City on the last day of the Congress.

MR. MOODY: Mr. Chairman, I would like to say a word in reply. You have adopted this morning a long line of resolutions, several of which were adopted without one person of the members here understanding the purport of them. I say that these are very important, that they go out as the views of this Congress, and they ought to go out after due and careful deliberation. If any of your fellows have any nice pet schemes to put through in this Congress on the rest of us through such proceedings as we have had here this morning, you are doing a great injustice to the Congress and the men who are spending their time and money for the great commonwealth for which we stand. I contend there ought to be a chance to discuss these things here on the floor, and let every one understand fully the purport of the resolutions we adopt.

JUDGE JOHN FAIRWEATHER, of California: Mr. President, I think it is only just and right that where each delegation here appoints, or selects a member of the Resolutions Committee from their own delegation, and when that representative has sat day after day for several hours at a time, it would really be rather peculiar for us not to affirm the resolutions of our own employes. If we do not select the right men on the Resolutions Committee, it is our own fault. Every state delegation should select the best man for the Resolutions Committee and direct your own man properly as to what resolutions you want to pass, and I believe you are justified in passing the resolutions here which the Resolutions Committee have unanimously adopted as your own report.

MR. KURT GRUNWALD, of Colorado: Mr. President, I just want to make the same statement that Judge Fairweather of California just made.

MR. R. H. FAXON, of Kansas: Mr. President, I simply want to say in response to what has been said on this question that very few gentlemen of this Congress appreciate what the deliberations of the Committee on Resolutions are. They usually begin on the first day of the session and they are almost interminable on the Committee, and any effort in the Resolutions Committee to cut off the deliberations of that Committee twenty-four hours before the close of the Congress is a suggestion of gag rule, or something of that sort. The Committee on Resolutions always endeavors to co-operate with the convention to the fullest extent, and I believe that in the last five of six Congresses, at least, the Committee has been an open forum, open to anybody who might wish to come before us.

MR. A. A. JONES, of New Mexico: Mr. Chairman, may I ask a pertinent question? What is the purpose or the need of referring these resolutions to the Congress for adoption?

PRESIDENT FOWLER: Mr. Faxon, will you answer that question?

MR. FAXON: These resolutions come before the Congress for consideration, for further consideration. I am not arguing against what is being contended for, but against the condition which always exists with the Committee on Resolutions, showing its helpfulness and the gravity of its duties, and the way in which it has always discharged those duties.

MR. A. R. SPRAGUE, of California: Mr. Chairman, I desire to make an amendment to the motion to the effect that the Committee on Resolutions be requested to make an up-to-date report so far as their work has gone, twenty-four hours before adjournment.

MR. MOODY: I will accept that amendment with pleasure.

PRESIDENT FOWLER: The motion as amended now is that the next organization urge upon the Committee on Resolutions the making of an up-to-date report of the work that they have done at least one day before the adjournment of the Congress.

The motion prevailed.

PRESIDENT FOWLER: The report of the Committee on Permanent organization having been adopted, the next is the selection of the next place of meeting. As you have adopted the report of the Committee on Permanent Organization as your report, the Chair will consider that you have settled on the place of meeting as Salt Lake City, Utah. (Applause.)

Also that carries with it the election of the officers, as reported by the Committee on Permanent Organization. (Applause.)

Mr. Austin, of Salt Lake.

MR. GEORGE AUSTIN, of Utah: Utah invites all of you to come to the National Irrigation Congress at Salt Lake next year. Come and bring your friends and your wives, and sweethearts, and we promise to show you a good time.

PRESIDENT FOWLER: All delegates interested in drainage are requested to assemble immediately in the Green Room at the Congress Hotel, across the street.

Mr. Bartlett of Wyoming is desired on the stage.

There will be a meeting of the incoming Executive Committee at two o'clock this afternoon at the La Salle Hotel, parlor 1509.

Dr. McGee having deferred to other speakers and given them his time, has had no opportunity to read the paper that he prepared at the request of the Program Committee, and being within the knowledge of the Program Committee, unless there is objection on the part of the delegates it will be included in the printed Official Proceedings. There being no objection, it is so ordered.

Paper by

W J McGee, LL. D.

Soil Water Expert, U. S. Bureau of Soils, Department of Agriculture

PRINCIPLES UNDERLYING WATER RIGHTS

1. Proper regulation of running water for the several uses of water supply, irrigation, power and navigation can be effected only in the light of the physical relations, the relations in equity, and the more salient legal relations of water in streams.

PHYSICAL RELATIONS

2. The fresh water of the land is derived directly from rainfall (including snow) and indirectly through evaporation from the sea. The mean annual rainfall on mainland United States ranges from less than 5 to over 100 inches, averaging 30 inches; the quantity aggregates about 5,000,000,000 acre-feet.* The distribution is unequal; over the eastward two-fifths of the country the mean is about 48 inches, over the median fifth some 30 inches, and over the westward two-fifths about 12 inches.**

3. In humid lands the water of rains and melting snows tends to gather into streams, generally taking the shortest and easiest paths to the sea, while in arid lands (except in a few rivers fed by the greater rain and snow of mountains) it tends to spread into debris-laden sheetfloods and will not flow down to the sea; lakes, in which water lodges for a time, are essentially expansions of streams due to what may be called geologic accidents—e. g., the Great Lakes chiefly to glacial scouring, the Millelacs to the irregular configuration of glacial-drift surfaces, Great Salt and Winnemucca Lakes originally to warping of the earth-crust; waterfalls, in which power is easily developed, are also due to geologic accidents—e. g., Niagara and Genesee and St. Anthony to conditions attending withdrawal of the Pleistocene glaciers, the cataracts of the Susquehanna and Potomac and James and The Dalles of the Columbia to displacement in the earth-crust.

4. In humid regions (including mountains in which rain and snow are more abundant than over neighboring lowlands) the streams carry a part only of the water reaching the surface—i. e., the run-off, averaging about one-third of the rain-fall; about half the aggregate is evaporated, partly from the soil and open waters though more freely from growing vegetation, forming the fly-off; while a smaller fraction (the cut-off) passes deeply into the earth to be absorbed in chemical combination or carried subterraneously to the sea. In arid regions there is (normally) no run-off, and all the water except the small cut-off is evaporated to temper the local climate.

5. In a state of nature—and also under intensive cultivation—little, if any, storm water flows over the land surface apart from the streams; the rainfall is absorbed by the soil and its vegetal growth, and the streams are supplied partly by springs but much more largely by seepage directly into their channels—this being the normal condition, in which streams are generally clear and nearly uniform in flow.

6. Under certain conditions attending settlement, especially with injudicious clearing and negligent cultivation, a considerable part of the rain falling during storms runs off the land surface, erodes the soil, renders streams turbid, gathers into destructive floods, and introduces wide fluctuations in flow (this representing what may be deemed a temporary condition in the history of the country, and one remediable by proper classification and use of the lands for purposes to which they are adapted, and by intensive cultivation of areas devoted to the growing of seasonal crops).

7. All parts of each stream are interrelated; increase or decrease in volume, inwash of detritus, the initiation of fluctuation, or other changes in regimen at any point eventually affect the stream throughout; especially susceptible to disturbance at the sources are clarity and steadiness of flow at points whence water supply is commonly

*The acre-foot is a convenient unit not only because in common use throughout arid America but because large enough to measure water in its national aspect without use of incomprehensibly large figures. It equals 43,560 cubic feet, 326,047 gallons, or 1,359.6 tons; it is something over a kilostere (equaling 1.2335 ks.), or cube of 10 meters.

** "Soil Erosion," Bureau of Soils Bulletin 71, 1911, p. 17.

taken, in the middle course where power development is customary, and in the lower course devoted to navigation.

8. Normal streams, being derived chiefly from seepage, are maintained directly by the store of water accumulated in the ground as the residuum of rains of preceding seasons and decades, and only indirectly by the current rainfall. In the humid and sub-humid parts of this country the ground water within the first hundred feet from the surface has been estimated at some 25 per cent of the volume of sub-soil and rock, equivalent to 6 or 7 years' rainfall—i. e., it may be conceived as a reservoir of water 25 feet deep coinciding in area with the region extending from eastern Colorado to the Atlantic coast. This reservoir is the chief source of the streams available for water-power and other purposes; it is also the reserve agricultural capital of the country, and the measure of productivity and habitability. In the semi-arid states the ground water is less in quantity and unequally distributed, but of relatively greater industrial importance.

9. Under extensive clearing and cultivation, the store of ground water has been materially depleted. Recent determinations based on records (covering a mean period of about 22 years) of 9,507 wells in the nine states of Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Ohio, Tennessee, and Wisconsin reveal lowering of the water-table at a minimum rate of 1.315 feet,* or with moderate allowance for new wells, 1.73 feet per decade, equivalent to an aggregate of 13.8 feet for the 80 years since settlement began. This lowering of the level of saturation corresponds with an actual loss of water averaging 5.2 inches per decade, or nearly 150,000,000 acre-feet annually (over four times the total used for irrigation in the entire country) within the nine states. The loss is due largely to increased run-off in freshets and floods, which are in increasing degree wreaking destruction of property and loss of life; while innumerable springs and smaller source streams have disappeared, the regimen of nearly all streams has been impaired, and the humid region has been brought nearer the condition of the arid lands.

10. The rate of subsidence of the water-table varies from state to state; in those enumerated it declines from 2.464 feet per decade in Minnesota to 0.8 foot in Ohio, while in Missouri it is but 0.43 foot. When the variable rates are co-ordinated with the geographic re-

*The records are summarized in the table following; the detail figures appear in the Yearbook of the Department of Agriculture for 1911 under the title "Subsoil Water of Central United States".

State	Dates		Total Wells		Bi-State Wells			Water Tables			
	Number	Mean	Number	Mean Depth	Total	Unchanged	Changed	Mean Lowering	Total Number	Mean Depth	Mean Lowering per Decade
Illinois.....	940	1884	1,224	51.7	925	426	499	2.80	1,224	25.6	1.077
Indiana.....	720	1887	939	53.5	657	291	366	2.89	939	26.7	1.256
Iowa.....	1,303	1887	1,527	84.4	1,160	632	528	3.61	1,502	46.1	1.570
Kentucky.....	579	1887	805	41.2	595	254	341	1.97	805	29.4	0.856
Michigan (lower)...	843	1890	987	60.7	720	455	265	2.01	966	33.4	1.005
Michigan (upper)...	72	1898	87	42.7	74	26	48	2.29	87	27.2	1.908
Minnesota.....	1,013	1896	1,158	76.5	920	404	516	3.45	1,132	42.8	2.464
Ohio.....	956	1880	1,243	44.9	908	425	483	2.41	1,243	24.8	0.800
Tennessee.....	518	1891	758	54.3	487	235	252	1.94	758	39.0	1.023
Wisconsin.....	672	1891	779	74.5	620	234	386	3.87	777	49.5	2.037
Aggregate.....	7,616	.....	9,507	.....	7,066	3,382	3,684	.....	9,433	.....	.....
Average.....	.....	1888.3	.....	61.3	.....	.....	.....	2.85	.....	35.1	1.315
Missouri.....	1,147	1888	1,527	58.7	1,048	710	338	0.95	1,520	33.6	0.432
Grand aggregate	8,763	.....	11,034	.....	8,114	4,092	4,022	.....	10,953	.....	.....

lations of the several states, it becomes clear that the ground-water reservoir of the entire Interior is continuous, that Missouri is supplied in part by underflow from the Plains and Rocky mountains, that the level in Ohio is kept up in part by seepage from Lake Erie (explaining that discrepancy between inflow and discharge from the lake which has led to excessive estimates of evaporation), and that Minnesota has merely lost proportionately with the absence of external sources of supply—in short that throughout this area of 532,402 square miles (and presumably elsewhere in the humid country) the reserve store of ground water is not only continuous and fairly conformable to the land surface but moves slowly down-slope in directions generally corresponding with those of the surface streams. In the semi-arid country the movement is similar, and the ground-water accumulates within the intermontane valleys.

11. The recent researches demonstrate that the surface streams available for water supply and navigation no less than power are interrelated through the ground-water reservoir in such wise that the regimen of each is dependent on the integrity of the ground reserve by which it is chiefly maintained. The essence of a stream resides in its continuity of flow; and this continuity of flow is in nature due absolutely and wholly to continuous supply from the store of ground water.

12. Since the water-vapor which bathes the continent and tempers its climate is not all precipitated on the land over which it passes, but in part goes on over adjacent seas; since the part precipitated as rain and snow and distilled as dew is largely re-evaporated from soil and open water and especially from growing plants whose vitality it sustains; since the residuum mainly soaks into the earth (and should do so wholly, in order to retain the best natural and artificial balance) where it forms a reserve store of ground water for a period averaging perhaps ten years; and since streams are fed chiefly—under the best conditions wholly—from this ground-water reserve, it follows that the fresh water of the country as a whole, in its forms of vapor, rain, snow, dew, ground water, lake, and stream, is essentially a grand physical unit made up of interdependent parts, and that each stream, despite its essential unity and interrelation of all its parts, is but an integer within the larger unit.

RELATIONS IN EQUITY

13. Water is the prime necessary of life. Fully five-sixths of human food, and indeed a like proportion of the human body, consists of H_2O , or water, chiefly in its simple form, partly in chemical combinations. In the human organism water is essential to assimilation, to metabolism or structural growth, to reproduction—indeed it would appear that no vital process occurs in the absence of water or otherwise than as a manifestation of its inherent properties. In the plants and lower animals yielding human food and clothing, water plays an equally essential role—indeed without water the continent would be unproductive and uninhabitable, and the lands of the planet but a dead world.

14. In this, as in other countries, water is the primary natural resource. Industrial and other forms of activity on which rest the power and growth of peoples and states depend absolutely on the maintenance of human life and population, which in turn depend on food and measurably on apparel; and whatever its breadth in land and wealth in minerals, no continent can sustain human life and population without sufficient water for drink and for producing from the soil the materials for solid food and clothing. The average crop plant transpires 450 times the weight of its own (dry) substance in water during its growth; and reckoning evaporation from the soil of the

moisture required to maintain in proper texture, the agricultural duty of water is to produce one-thousandth of its weight in average plant crop, or one four-thousandth in grain, or perhaps one forty-thousandth in meat.*

Under rigid economy an adult human worker may be sustained for a year by 200 pounds each of bread and meat, with 2,000 pounds of water for drink; or, since the bread and meat require for their production respectively 400 tons and 4,000 tons of water, something over 4,400 tons of water in direct sustentation, apart from that required for ablution and for melioration of climate through aqueous vapor in the air. Under irrigation, where alone agricultural water is commonly measured, a five-acre farm supplied with 60 inches of water per year will sustain a family of five, including surplus produce for exchange; this is at the rate of five acre-feet (about 6,800 tons) per inhabitant—at which rate mainland United States might sustain permanently, with its 5,000,000,000 acre-feet of rainfall, a population of 1,000,000,000; the 2,000,000,000 acres of land would indeed support over 2,000,000,000 people if occupied to the density of Belgium (649 per square mile)—but neither land nor any other resource except water affords any measure whatever of the capacity of the country for production, population' power, or perpetuity.**

15. As the primary resource, water alone gives value not only to land (as is clearly realized in arid regions) but to all other resources. It is the ultimate basis of values, and can not equitably be regarded as an appurtenance to land or to any other subordinate resource, though in equity land and other resources may be—and in arid countries are commonly—considered appurtenant to the natural water.

16. As the prime necessary of life—the ultimate basis of existence for each of the individuals united in the Nation—the water of the country is, under that leading principle of our national existence that all men are equally entitled to life, liberty, and the pursuit of happiness, the common and indivisible possession of all—a possession in equity inalienable and indefeasible, since no constituent of the Nation could alienate or divest himself of his share without surrendering his right to life and so weakening the Nation.

17. As the common property and equitable possession of all, water in any form, together with the appurtenant lands or other resources, may be administered in the public interest by municipalities, states, and the national government; but no public agency may in equity alienate, or divest the people of any part of the common interest in the water, nor may it equitably transfer any right to use of the water without just consideration in the public behalf. As the prime necessary of life and the primary resource, and as the common possession of all, water is in itself a special property, and its equitable administration is rightly the most sacred trust confided by the People in their chosen representatives and officers.

18. While the uses of water are diverse, they are not equally essential to life and to that general development of the country on which its power and perpetuity must rest. Since life can exist without it for but a few days, the primary use of water is for drink and other domestic supply, in which it is consumed; since continuous life can be sustained and the generations maintained only through food and clothing produced by its consumption, the secondary use is for agriculture, including irrigation; since the measure of industrial proficiency is the conquest and use of power, the next use of water in order of importance is for mechanical power, in which its substance (or corpus) is not consumed, though its movement is utilized; and since

* "The Agricultural Duty of Water," U. S. Department of Agriculture *Yearbook* for 1910, pp. 169-76.

** "Prospective Population of the United States," *Science*, vol. 34, 1911, pp. 428-35.

the activities of commerce are necessarily subordinate to the primary industries, the least essential use of water is for navigation, in which it is not consumed and only its inert corpus is utilized. Yet the several uses may and should be combined, as when water for domestic supply or irrigation is used for power—and the development of power generally promotes navigation.

19. Since the individuals collectively owning the water of the country are merged in various business and civic organizations without loss or impairment of their individuality or their rights and duties as constituents of the nation; since the circulation or rain-yielding vapor is wholly independent of civil boundaries, while the movement of ground water generally, and the courses of streams largely, are independent of such bounds; since water in artificial conduits and hydroelectric power are essentially commodities and the physical means of carrying them are frequently interstate; and since the chief uses of streams commonly vary in different parts of their courses and often in civil divisions, while the Federal Government alone can deal with interstate navigation and international waters, no municipality or State or Federal agency can claim exclusive jurisdiction over water, or the exclusive right to administer it.

20. Since the chief purpose of statutes and common-law and courts is to prevent inequity, so that their nature is static and their effect generally prohibitive or restrictive or at most permissive, while the activity on which development depends is dynamic and constructive and in its essence progressive (wherefore it is not initiated but merely guided in direction by the static qualities of law and court), it follows that the inherently progressive development in the use of water attending the natural growth and orderly development of the people can best be fostered by combining individual and institutional agency in the highest practicable degree—i. e., by effective co-operation among individuals and both business and civic organizations, including corporations, communities, municipalities, States, and Federal agencies.

LEGAL RELATIONS

21. Most legal relations affecting the uses of the water of the country are prohibitive or restrictive, or otherwise negative in character; comparatively few thus far developed are positive and constructive.*

22. Constructive development of the legal relations of water in eastern United States began with Chief Justice Marshall's interpretations of the Commerce Clause of the Constitution, largely in *McCulloch v. Maryland* (4 Wheaton, 316-437) and more specifically in *Gibbons v. Ogden* (9 Wheaton, 1-240), which established Federal authority over navigable streams and navigation; and the next noteworthy constructive step was taken by Chief Justice Taney when he cut loose from the English definition of navigability, showed that English standards are wholly inapplicable to this country, and established the principle that the question of navigability is one of fact (*The Gen-*

* Normal development of appreciation and equitable use of water in this country was unfortunately retarded through decisions and sometimes through statutes and State constitutions applying (without shadow of Constitutional warrant) principles arising in the English common-law, under which water is virtually held a mere appurtenance to land—a usage arising in a small and well watered but nearly riverless island, and not only illogical in itself (in the impossible condition that a user may remove water from a stream provided he does not impair the flow) but wholly inapplicable to a great continent containing large rivers, though insufficiently watered as a whole. Better standards would doubtless have arisen through importation of the French-Roman law (through the Code Napoleon), under which the water may be said to pertain to the community, save that it was practically limited to the over-watered State of Louisiana; and still better standards were actually introduced into the arid region in the Spanish-Roman law, under which water is allotted by prior claim and continued beneficial use and the land is virtually appurtenant thereto; though this equitable principle has been gradually outweighed by the force of the non-equitable English common-law brought in from more populous sections.

ese Chief v. Fitzhugh, 12 Howard, 443, et seq., especially 456-17)—a principle ever since recognized in this country, save as laxity in Federal administration and zeal in State aggrandization have permitted insidious invasion of navigable and necessary source streams by devices for other uses of the water. The third step in the same line (with which advance practically terminates) was marked by the Supreme Court decision in the Rio Grande case establishing the power of the Federal Government to protect the source streams on which depend the navigability of the lower waters (United States v. Rio Grande Dam and Irrigation Company, 174 U. S., 690-710)—the oft-quoted Kansas-Colorado case, though comfortable, being virtually a nonsuit and of little bearing on principles affecting the general relations of water.

23. The most significant advance in the development of legal relations affecting the primary use of water in this country was made in the decision of the New Jersey Court of Errors and Appeals, subsequently affirmed by the U. S. Supreme Court, that the people of the state collectively have a residuary right in the intrastate waters (Hudson Water Company v. McCarter, 209 U. S., 349-358), a manifestly valid doctrine which requires nothing but application in other states with respect to their intrastate waters, and extension to the concomitant Federal authority over interstate waters in their nature as navigable streams or as sources of such streams, to work a great public benefit. A development of the same equitable principle appears in an opinion of the Supreme Court of Maine that the legislature may prescribe such control of private property in woodlands as may be required to protect public interests in the permanent water supply conserved by the forests; while the Oregon water law of 1909 by clear implication and the California water law of 1911 in specific terms declare that the waters of the state belong to the people of the state.*

24. During recent years the Congress has enacted various constructive laws conformable with and even extending the principles so established by the United States and state courts. The most conspicuous of these is that providing for the reclamation of arid districts by expending certain proceeds of public land sales in diverting water from its natural channels to irrigate dry tracts, thereby promoting the public welfare (conformably with the "General Welfare" clause of the Constitution) through a virtual extension of the public domain in substantial accord with the principle of the Spanish-Roman law under which other resources are essentially appurtenant to water. A related principle was applied in the creation and maintenance, through administrative and legislative action, of national forests designed not only to protect timber but to conserve the water of source streams; and it was definitively established as a national policy within a year by an act providing for the purchase of lands in the Appalachian and White mountains for the specific purpose of conserving source waters, primarily and ostensibly to protect navigation in the lower rivers—though it was well understood in the deliberations attending the enactment that incidental effects of even greater public benefit would arise from protection of the streams in their middle courses where they may be used for power development without impairment—indeed with promotion**—of navigable below, and from the general conservation of the natural water for all other uses (in fact, it would appear that this act was passed in direct response to a popular demand

* Some State constitutions, as in Colorado, provide that waters within the State belong to the State, thereby setting up a claim to interstate waters bound to eventuate in expensive and fruitless litigation unless the claims are composed by equitable cooperation and sharing of natural and legal rights and duties between the States and the Federal Government.

** Not only does each open reservoir for power development hold back the flow of the stream and so shorten the low-water season, but each serves to saturate the adjacent soil and subsoil and rock with an additional volume of water and serving the same end—a volume often comparable with that of the pond itself.

based on manifest equities and recognition of the public good rather than on any narrow construction of common-law or statutes or decisions).

25. Sundry enactments by the Congress during recent decades serve to establish what may be considered an inchoate national policy touching the development of water-power on navigable streams whereby, (1) when a franchise is given a private corporation to erect dams the Federal Government reserves the right to use without charge so much of the power developed as may be required for specific purposes, a reservation which may be deemed in the nature of consideration (and recently this was extended by making the consideration specific and limiting the term of the franchise); (2) when works are constructed co-operatively between the Federal Government and prospective power users the Government reserves rights of administration and for specific uses, and also limits the tenure of the lease or franchise to a specified period; and (3) when the dam is constructed at Federal cost the leasing of power developed thereby is authorized under conventional restrictions as to advertising, etc.* The policy so initiated is not only naturally susceptible of extension with growing knowledge concerning physical relations and the increasing value of power attending the natural growth and orderly development of population and industries, but clearly requires such extension in the interest of general welfare.

26. Federal legislation touching river and harbor improvements has commonly been kept well within the principles laid down by Marshall and Taney, has apparently disregarded the vital principle established in the Rio Grande case, and has shown little progress in the development of standards and ideals conformably to the needs of a great and growing country either for improved transportation or for better use of streams; yet a notable advance has arisen in connection with

* The first case is covered by the provision of the general "Act to regulate the construction of dams across navigable waters" (1906) to the effect that "The person owning such dam . . . shall grant to the United States a free use of water-power for building and operating" any constructions which may at any time be required "in the interest of navigation" (U. S. Stat. at L., vol. 34, p. 386); and this provision is reaffirmed in special laws of various dates. The second case is exemplified by "An Act to enable the Secretary of War to permit the erection of a lock and dam in aid of navigation in the Tennessee River near Chattanooga, Tennessee, and for other purposes" (U. S. Stat. at L., vol. 33, p. 309), in which it is provided in Section 4 "That in consideration of the construction of said lock and dam, free of cost to the United States . . . The United States hereby grants . . . such rights as it possesses to use the water-power produced by said dam, and to convert the same into electric power or otherwise utilize it for a period of ninety-nine years: *Provided*, that it or they [the grantees] shall furnish the necessary electric current while its or their power plant is in operation to move the gates and operate the locks and to light the United States buildings and grounds, free of cost to the United States: *And provided further*, . . . That the Secretary of War is hereby authorized to prescribe regulations to govern the use of the said water-power and the operations of the plant and force employed in connection therewith." The third case is covered in the provision of the River and Harbor Act approved June 13, 1902 (U. S. Stat. at L., vol. 32, p. 358), under the item for "Improving Cumberland River, Tennessee, above Nashville," as follows: "And the Secretary of War is hereby authorized, in his discretion, to grant leases or licenses to the highest responsible bidder for the use of the water-power created by said dam at such rate and on such conditions and for such periods of time as may seem to him expedient . . . *Provided*, that any lease or license so granted shall be limited to the use of the surplus water not required for navigation . . . *Provided further*, that before leasing or licensing such water privileges, or issuing permits for the construction and operation of such canals, or otherwise disposing of any water-power or privilege, the Secretary of War shall first advertise the same in one or more daily papers at Nashville, for sixty days immediately preceding, stating specifically the right or privileges proposed to be leased or conveyed, with its exact limitations, inviting bids for the same, and he may, in his discretion, then lease the same for a specific term of years at so much per year, to be paid semi-annually in cash into the Treasury, and the Secretary of War shall preserve the right to reject any or all bids." The extension in the first case is covered in the amended general dam act approved June 23, 1910, by the provisos "That . . . The Chief of Engineers and the Secretary of War shall consider the bearing of said structure upon a comprehensive plan for the improvement of the waterway over which it is to be constructed with a view to the promotion of its navigable quality and for the full development of water power; and . . . shall provide for improving and developing navigation, and fix such charge or charges for the privilege granted as may be sufficient to restore conditions with respect to navigability as existing at the time such privilege be granted;" and "That the authority granted under or in pursuance of the provisions of this Act shall terminate at the end of a period not to exceed fifty years from the date of the original approval of the project."

the work of the Mississippi River Commission which, in co-operation with state officials in Mississippi, Louisiana, and perhaps other states, has extended its work from merely perfunctory revetment of banks for improving navigability in the lower Mississippi to design and location of revetments in co-ordination with the state work for protecting adjacent lowlands, and has even aided in levee construction—thereby establishing (1) the principle of co-operation between State and Federal agencies, and (2) a recognized duty on the part of the Federal Government to so control regimen in navigable streams as to protect adjacent lands.

27. Repeated enactments by the Federal Congress in conformity with the work and reports of the administrative departments seem to have established, at least in inchoate form, a duty of the Federal Government to take measures looking to the control of all the waters of the country in the public interest: In the War Department the physics and hydraulics of the Mississippi were investigated with a view to control of the river; in the War Department and later in the Department of Agriculture rainfall was measured with reference to drainage basins and stream floods, while of late floods are gaged and flood warnings are issued for the public benefit; in the Interior Department the Hydrographic Branch of the Geological Survey is gaging all the streams of the country and determining their regimen (including the amount of sediment in the water) with a view to more complete control, the work being sometimes done in co-operation with states; in the same department the operations of the Reclamation Service in diverting streams for irrigation, generally in co-operation with individuals and states, are carried forward vigorously; in several bureaus of the Department of Agriculture investigations and measurements of water are conducted with respect to irrigation, drainage, soil-plant circulation, destructive erosion, etc. (indeed it may be said that the function of the Department is dealing with water and its derivatives) all looking toward increasingly complete control and utilization for the public benefit, while, largely in co-operation with individuals and state institutions, the growing knowledge is applied and the control extended from year to year in increasing degree; in the Department of Commerce and Labor the Bureau of Corporations has made a systematic investigation of navigation with a view to better regulation of both natural and artificial facilities; and in the same Department the Census Bureau has reckoned the actual control of water for irrigation. Under the Federal legislation and administrative operations, water is not only measured more accurately than in any other country but is steadily passing under control in the public interest, largely through co-operation with individuals and States, yet always in such wise as to exemplify and establish the common interest of all the people in the water of the country. The advance in this direction during the last decade has been especially rapid; and though apparently little noted, it is among the most significant in our entire history with respect to knowledge, use, and administration of the natural waters.

28. Especially in connection with municipalities, a usage has arisen with growing necessities which is congruous with current legal practice in detail, although incongruous with foreign legal notions that water is a mere appurtenance to land, or a form of feral nature unsusceptible of control and ownership. In all leading cities adequate water supply is provided substantially at public cost, and such lands as may be required to accommodate mains and reservoirs or other works are acquired for the purpose by condemnation or otherwise, while in many cities the lands required for catchment areas are either condemned or purchased, or else arbitrarily protected from contamination—all in accord with the principle of the greatest good to the greatest number; in some cities (notably Los Angeles) the income

from power developed by the head of the water is, or is to be, applied in liquidating the cost of both waterworks and land; some municipalities (again notably Los Angeles) allot the surplus water to irrigation for the common benefit, while in many towns and cities the surplus is used in sewerage systems sometimes designed to repay cost through useful disposition of the sewage. The several cases mark growing recognition of the fundamental fact that water is the prime necessary of life and the primary resource, and serve to establish, at least in inchoate form, the doctrine that as population grows dense in relation to the quantity of water, land necessarily becomes a mere appurtenance to that resource on which the lives of the people depend.

29. Under the generally progressive development of legal relations throughout our history, a foundation has been established not only in equity but in law for constructive action by State and Federal legislatures, and for judicial decisions more in accord with current knowledge and existing conditions than with archaic standards developed in other countries of different conditions.

30. The essential principle of natural equity on which specific legislation may rest has already found expression, both by statesmen and by powerful associations of citizens including both jurists and publicists, in the incontrovertible proposition—now become axiomatic—that **All the water belongs to all the People.**

PROPOSED APPLICATION OF PRINCIPLES

31. Any action looking toward better utilization and development of the water of the country should be influenced by the magnitude of the values involved. Since water is the sole source of productivity and habitability, it is the primary basis of all values; and since the property of the country may be appraised at a figure approaching \$150,000,000,000, while the water reserve (stored chiefly in the ground) may be estimated at ten years' rainfall or 50,000,000,000 acre-feet, the one may be balanced against the other as the gold reserve is balanced against the currency whose circulation maintains property values. Reckoned in this way the value of the water reserve may be put at \$150,000,000,000 in gross, i. e., \$3 per acre-foot or 2.2 mills per ton—a reasonable figure, corresponding fairly with current cost of irrigation water, and far less than any current water rates in cities or even the ordinary margin of rates above the cost of waterworks. In connection with the gross valuation, it may be noted (chiefly on the basis of estimates by the National Conservation Commission toward the end of 1908) that more than 10,000,000 of our people are supplied—largely from protected catchment areas of over 1,000,000 acres—by waterworks, which for 42 cities (not including Chicago, Philadelphia, Cleveland, Cincinnati, et al.) cost no less than \$271,159,483 and perhaps as much more for catchment basins, and supply 1,324,300 acre-feet of domestic water,* worth in round figures, computed at \$3 per acre-foot, \$4,000,000 annually; that some \$200,000,000 are invested in irrigation works, using 34,000,000 acre-feet of water (worth over \$100,000,000) annually to render productive 13,000,000 acres of arid lands; that the water-power available at a cost comparable with that of steam installation is 37,500,000 horsepower (enough to "operate every mill, drive every spindle, propel every train and boat, and light every city, town and village in the country"***), worth in gross earning capacity \$20 per horsepower-year or \$750,000,000 annually; that the annual loss through draining away of the ground water in only nine Interior States, reckoned at \$3 per acre-foot, is \$442,000,000; that the

* Report of the National Conservation Commission, (60th Congress, 2nd Session, Senate Document 676), 1909, vol. II, p. 178.

** Ibid., vol. I, p. 41.

estimated yearly loss through soil erosion is \$500,000,000; that if navigation were so developed that one-fifth of our freight moved by water the annual saving to producers and consumers would be \$250,000,000; and that needed drainage of our 75,000,000 acres of swamp and overflow land would add some \$20 per acre above the cost of draining (or \$1,500,000,000) to our national wealth, and provide home-sites for 5,000,000 to 7,500,000 families. Even the most conservative figures indicate that the development, control, and utilization of water raises the largest and one of the most pressing economic issues now before the American People.

32. Since the uses of water are interdependent and most of the physical relations interstate, complete control may not be exercised justly either by any single State sovereignty or by exclusive Federal sovereignty; so that concurrent legislative and administrative action is required by States and the municipalities within them and by the Federal Government.

33. Since under the Constitution the Federal Government is primarily responsible for the general welfare, requisite action may properly, and in view of the urgent demand should without needless delay, be initiated by the Congress.

34. The magnitude and complexity of the interests affected, the delicacy of the legal relations involved, and the dearth of both exact knowledge and practical experience concerning the several uses of water, all indicate that action taken at this juncture should be constructive and developmental rather than definitive. While the relations in equity seem clear, and while the legal relations appear to form a firm foundation for a broader legal structure than has hitherto been attempted, the technical experience needed to guide definitive legislation remains inadequate. It is barely over a decade since electric power transmission began reconstructing industries, since the internal-combustion engine began closing the age of steam (which may re-open under the steam-turbine), since steel-concrete construction began revolutionizing the use of resources, since irrigation began opening a new era in standards of production; and the concepts of even the most advanced jurists and law-makers can hardly be quite abreast with, much less far in advance of, the technical experience attending these industrial developments. Moreover, the concept of water as a common possession in equity of all the people remains novel in many minds, and is bound to result in new and unforeseeable interrelations among individuals and civic organizations, and especially between States and the Federal Government—interrelations that can be adjusted and regulated in the common welfare only as common experience grows with advancing applications of increasing knowledge. It would no more be practicable to establish definitive regulations for the use of the natural waters to-day than it would have been to create our magnificent railway system by fiat 80 years ago, to establish our intricate banking system when the Constitution was framed, or to found by a stroke of the pen 20 years ago the Department of Agriculture with its hundreds of scientific experts, made such by long-continued training. The need for action presses; but wise action today can be no more than preparatory for, and directive of, prospective and inevitable development.

35. In view of the interstate relations of our natural waters, action by the Congress should be framed with special reference to that comity with and among the States best maintained by sharing, rather than by disputing as of old, common interests—a course in which useful experience has been gained in the Mississippi River Commission and Reclamation Service, as also in the Forest Service and other leading bureaus of the Department of Agriculture; and the Federal legislation should not merely form a model for States, but should

authorize necessary administrative action directly and in conjunction with States.

36. Since practical experience is a sine qua non for wise legislation, early State and Federal enactments should be framed in general terms, entrusting the actual work to administrative agencies under proper restrictions and provisions for reporting progress to the legislative authority, much as in the statutory authority for State and Federal Departments.

37. While the magnitude and importance of the issue involved in control and utilization of water would warrant the creation of a Federal Department to meet it, such action at this juncture might be premature—especially since the more pressing requirements may be met through existing departmental facilities. The several considerations point toward a presumptively temporary Federal administrative agency created or empowered to make investigations and take action looking toward the progressive control and regulation of the water of the country with respect to all uses, both directly and in co-operation with States and when needful with individuals, corporations, communities, and municipalities—such agency to report through the Executive annually and at such other times and in such modes as the Congress may require. It should be among the first duties of the Federal agency to confer with officers or other competent representatives of States concerning water-power and other uses of water with a view to determining means of effective co-operation, equitable sharing of rights and responsibilities, estimates of cost of works required for State and Federal use, reasonable rates for domestic and irrigation water supply and for power, and all other matters of common concern to the State and Federal Governments—the determinations to be reported to the State legislatures and to the Congress as a basis for further action in the public interest in accordance with the righteous principle of the greatest good to the greatest number for the longest time.

38. While it is not necessary and might be inexpedient for current Federal legislation to specifically declare the principle that all the water of the country belongs to all the People of the country, the enactments may not equitably, nor judiciously in view of the trend of that public sentiment in which lies the power of the Nation, be open to construction as dissenting from or denying that principle; for already this has become part of the body of ethical conviction underlying American character and constituting its strength.

PRESIDENT FOWLER: There has not been read before the Congress, and I desire to have it read in order to get it into the Official Proceedings, the following telegram to the President:

“The President, White House, Washington, D. C.

The National Irrigation Congress now assembled in its nineteenth session at Chicago acknowledges, with gratification, the greetings sent by the President of the United States and while regretting that the pressure of public business prevented his personal attendance, nevertheless assures him that his written expression of interest in the great national purposes of this organization have struck a responsive chord in the minds of every delegate present.”

Also a telegram to the Pueblo Star-Journal, as ordered by the Congress:

“Pueblo Star-Journal, Pueblo, Colorado:

“The National Irrigation Congress deeply appreciates the congratulations of the people of Pueblo and Colorado through the Star-Journal on auspicious opening of the Nineteenth National Irrigation



R.R. McCormick
Chairman



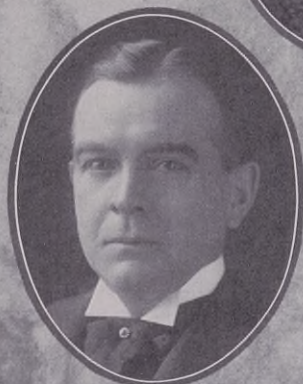
Dr. W.A. Evans



John C. Shaffer



W.L. Park



Frank E. Scott



Edmund T. Perkins

EXECUTIVE COMMITTEE
Chicago Board of Control

Congress and feels that the prediction of great benefit throughout the East will surely follow. The splendid record and achievements of the Pueblo Congress will live in the annals of the Congress."

And now, my friends, so far as the Chair knows, every matter of business has been brought before the Congress and has been attended to.

Before we adjourn the Chair desires to express his sincere thanks to the Congress for their patience and their courtesy and their good will which have been personally expressed by so many of you.

It is not an easy matter to stand before a body of this character and administer its affairs. It has been my privilege and my honor now for two years to do this work. So far as the Congress is concerned they have been two years of great pleasure and satisfaction, and I could not let you go without thanking you, most sincerely thanking you, and expressing the grateful feeling in my heart, if I am able to express it, for all of the courtesies and the kindnesses that you have shown me during these two years.

I thank you.

There being no other business to come before this Congress, I declare the Congress adjourned sine die.

Whereupon the Nineteenth meeting of the National Irrigation Congress adjourned without day.

APPENDIX

to the

OFFICIAL PROCEEDINGS

of the

NINETEENTH NATIONAL IRRIGATION CONGRESS

For the information of those interested in the work of the Congress and for convenient reference, there are included in this appendix to the Official Proceedings of the National Irrigation Congress various matters of interest in connection with the verbatim record.

Among the more important of these are the Constitution and Rules as revised at the Nineteenth meeting; a list of the general officers, Honorary Vice Presidents and Executive Committeemen of the Twentieth Congress; some general tables of interest in connection with the address (on page 36) of R. P. Teele concerning the Irrigation Census; the Newlands River Regulation Bill; financial statement of the Secretary and Treasurer of the Nineteenth Congress, and financial statement of the Chicago Board of Control.

CONSTITUTION

of the

NATIONAL IRRIGATION CONGRESS

(Revised at Chicago Session)

Article I—Name.

The Congress shall be known as the National Irrigation Congress.

Article II—Objects.

The objects of the Congress shall be (1) to promote and diffuse knowledge concerning irrigation and other uses of water, especially throughout the more arid portions of the United States; (2) to facilitate conference and deliberation among the people of the country concerning irrigation and related interests; and (3) to provide means for bringing the needs of the people and the country before state and federal governments.

Article III—Meetings.

Section 1. Regular annual sessions shall be held at such places as the Congress shall from time to time determine and at times set by the Board of Control and approved by the Board of Governors.

Sec. 2. Special meetings of the Congress, or of its officers, boards, and committees, may be held at times and places determined by the Congress or its officers.

Article IV—General Officers.

Section 1. The officers of the Congress shall consist of a President, five Vice Presidents, a Secretary who may act as Treasurer, and an Assistant Secretary. These officers, with an Executive Committee, shall conduct the affairs and transact the business of the Congress.

Sec. 2. The duties of these officers may at any time be prescribed by formal action of the Congress or Executive Committee. In the absence of such action their duties shall be those implied by their designations and established by custom.

Sec. 3. The officers shall serve for one year, or until their successors are elected; provided, that the President and Secretary shall not be relieved before the close of a regular annual session except by vote of the Congress.

Article V—Committees.

Section 1. There shall be an Executive Committee comprising one member from each state selected by the delegation thereof. This Executive Committee shall act for the Congress between sessions, shall have power to initiate plans and meet emergencies, and shall report to the Congress on the opening day of each session. The President, Secretary and all Ex-Presidents of the Congress shall be ex-officio members of the Executive Committee; but the Executive Committee shall select its own Chairman and an Executive Secretary, and may appoint sub-committees and boards. The Executive Committee shall have power to fill vacancies in its own membership and among the officers of the Congress, may make its own by-laws and rules of procedure, and may maintain a permanent office, but shall not incur debts beyond available funds.

Sec. 2. A working committee of seven, to be known as the Board of Governors, including the President, the Secretary, the Chairman of the Executive Committee, the Chairman of the Board of Control, and three others to be appointed by the Executive Committee, shall be created during each regular annual session to act for the ensuing year; its membership shall be drawn from different states, and not more than one member shall be appointed from any one state. The Board of Governors shall act for the Executive Committee and may be empowered to initiate action and meet emergencies. It shall report all transactions promptly to the members of the Executive Committee, and shall submit a final report on the day before the opening of each regular annual session.

Sec. 3. A local committee, to be known as the Board of Control, shall be created in each city in which the next ensuing session of the Congress is to be held, preferably by the leading commercial bodies or business organizations; though in the absence of such local action, or in the event of failure on the part of such Board of Control to meet the financial and other requirements of the Executive Committee within sixty days after the adjournment of the preceding session, another place of meeting may be selected by the Executive Committee in lieu of that chosen by the Congress. The Board of Control shall have power to initiate action in conformity with the objects of the Congress, to raise and expend funds, to incur obligations on its own responsibility, to appoint sub-committees, and to conduct correspondence in its own name, either independently or in conjunction with the Executive Committee; and it shall report to the Executive Committee on the day before the opening of the ensuing session, and at such other times as the Congress or the Executive Committee may direct. The Secretary of the Board of Control shall, ex-officio, be Assistant Secretary of the Congress, and shall report to the Secretary.

Sec. 4. A Committee on Credentials shall be organized on the first day of each session of the Congress. It shall consist of one member from each state chosen by the delegation thereof and a temporary chairman appointed by the President. Accepting the record of the Secretary as prima facie evidence of the organization of the Congress and of the rights of the delegates, the Committee shall adjudicate all questions relating to credentials and delegates. It shall report to the Congress from time to time, and shall submit its final report at the earliest possible date and in any event before the Congress proceeds to the adoption of formal resolutions, the selection of the next place of meeting, or the election of officers.

Sec. 5. A Committee on Resolutions shall be created for each

session of the Congress. A temporary chairman shall be appointed by the President, one member shall be selected by each state delegation, and two members-at-large shall be designated by the Board of Governors with a like number by the Board of Control. The Committee shall report to the Congress not later than the morning of the last day of each session.

Sec. 6. A Committee on Permanent Organization shall be created during each session of the Congress in the manner provided for the creation of the Committee on Resolutions. It shall nominate officers for the ensuing year, may recommend to the Congress the place for the next session, and may recommend administrative policies; and it may make other recommendations looking toward the public welfare or the interests of the National Irrigation Congress.

Sec. 7. By direction of the Congress standing and special committees may be appointed by the President.

Sec. 8. No person shall act on any committee as the representative of any state who is not a bona fide resident of that state.

Sec. 9. The President shall be a member ex-officio of every committee of the Congress.

Article VI—Arrangements for Sessions.

Section 1. Invitations from cities desirous of entertaining the Congress at regular sessions shall be brought before the Congress for action either directly or on recommendation of the Committee on Permanent Organization.

Sec. 2. To be acceptable, invitations to the Congress from cities desirous of entertaining it must be accompanied by information as to their facilities and by a guarantee fund satisfactory to the Congress or Executive Committee.

Sec. 3. Meeting places shall be provided and hotel accommodations and other facilities arranged by the Board of Control.

Sec. 4. The program for the session, including a list of speakers, shall be arranged by the Board of Governors, unless the preparation of the program be entrusted by the Board to the Board of Control. The entire program, including allotments of time to speakers and hours for daily sessions, shall be referred to the Executive Committee for ratification not later than the day before the opening of each session of the Congress.

Sec. 5. The program for each session shall provide for an evening reception or other meeting of social character adapted to the making of acquaintances and interchange of personal greetings.

Sec. 6. Unless otherwise ordered the rules adopted for the guidance of the preceding Congress shall continue in force.

Article VII—Membership.

Section 1. The membership of the Congress shall consist of (1) fifteen delegates from each state, to be appointed by the Governor thereof; (2) ten delegates from each city having a population of over twenty-five thousand, to be appointed by the Mayor; (3) five delegates from each city and town having a population of less than twenty-five thousand and over one thousand to be appointed by the Mayor or Chief Executive; (4) five delegates from each county, to be appointed by the Chairman of the governing board; (5) two delegates from each incorporated town having a population of less than one thousand, from each regularly organized association devoted to irrigation, agriculture, horticulture and engineering, from each college, and from each commercial body and club concerned with public interests which has been duly organized not less than one year; (6) all duly accredited members of state and federal irrigation, water, or conservation commissions; (7) all state engineers and state commissioners of agriculture and horticulture; (8) all officers, chairmen of committees,

members of the Executive Committee, Honorary Vice Presidents, members of the Board of Control, and permanent delegates to the Congress; (9) the Governor of each state, and the Mayor of each city and town having a population of over one thousand; and (10) all members of the United States Senate and House of Representatives.

Sec. 2. Any person may become a permanent delegate, having the usual privileges accorded to delegates and none other, on payment of the sum of ten dollars (\$10) and five dollars (\$5) annually thereafter, or, on payment of fifty dollars (\$50) at one time; and the Executive Committee is empowered to recommend persons as honorary permanent delegates for distinguished services in promoting the objects of the Congress. All Ex-Presidents of the United States and of the National Irrigation Congress shall be honorary permanent delegates.

Sec. 3. Throughout each session of the Congress the Secretary shall keep a list of the duly accredited delegates, and shall hold the same open to examination or subject to the call of the Congress; and such list shall be subject to appeal to and action by the Credentials Committee, and in the absence of appeal or after such action and approval by the Congress, shall constitute the membership of the body for that session.

Article VIII—Delegations and State Officers

Section 1. The several delegates from each state in attendance at any Congress shall assemble at the earliest practicable time and organize by choosing a chairman, a secretary and a member of the Committee on Credentials; and these delegates when approved by the Committee on Credentials shall constitute the delegation from that state.

Sec. 2. On organizing or as soon as may be thereafter, each state delegation will choose a member of the Committee on Resolutions and a member of the Committee on Permanent Organization to act throughout that session of the Congress, and a member of the Executive Committee for the ensuing year whose duties may begin with the close of the session; and in the absence of the member of the Executive Committee for the state at the opening of the Congress for which he was chosen, the delegation may select a substitute.

Sec. 3. In addition to the members of committees provided for herein, each state delegation may appoint an Honorary Vice President.

Article IX—Voting

Section 1. Each member of the Congress shall be entitled to one vote on all actions taken viva voce.

Sec. 2. A division may be demanded on any action by a state delegation or a ballot by an apparent majority of the delegates present; on division or ballot each member shall be entitled to one vote; provided (1), that no state shall have more than twenty votes, and provided (2), that any state having five delegates or less registered and present shall be entitled to five votes.

Sec. 3. Any state delegation may divide its vote in the ratio of duly registered delegates present at the time of voting; provided, that such division shall be stated in whole numbers.

Sec. 4. The term "state" as used herein is to be construed to mean either state, territory or insular possession.

Article X—Amendments

This Constitution may be amended by a two-thirds vote of the Congress during any regular session, provided notice of the proposed amendment has been given from the Chair not less than one day or more than two days preceding; or by unanimous vote without such notice.

RULES

FOR THE GUIDANCE OF THE NINETEENTH SESSION OF THE NATIONAL IRRIGATION CONGRESS

1. After the opening, each morning session shall be called to order at 9:30 a. m. and each afternoon session at 2:30 p. m. Unless otherwise ordered by vote of the Congress, evening sessions or other events shall begin at 8 p. m. Morning sessions shall adjourn at 12:30 p. m. unless otherwise ordered by vote of the Congress.

2. All sessions shall open promptly.

3. In the absence of the President at the time fixed for the opening, the duty of calling to order shall devolve on the First Vice-President, and in his absence on the Second, Third, Fourth and Fifth Vice-Presidents, the Secretary, the Chairman of the Executive Committee, the Chairman of the Committee on Credentials, the Chairman of the Committee on Permanent Organization, and the Chairman of the Committee on Resolutions, in the order here given.

4. Any delegate or other member desiring to speak shall address the Chair, and unless called on by name shall begin by giving his name and state. Communications on subjects not entered in the program shall be limited to three minutes unless otherwise directed by vote of the Congress.

5. General resolutions, after reading by the Secretary, shall be referred to the Committee on Resolutions without debate, and no general resolution shall be received later than Wednesday without unanimous consent. Special resolutions relating to the conduct of the Congress may be read and considered at the discretion of the presiding officer after examination by him.

6. The time of speakers in general discussion shall be limited to five minutes, and the time of speakers on questions or resolutions relating to the conduct of the Congress shall be limited to three minutes, unless otherwise directed by vote of the Congress.

7. The time of the first speaker in the program of each daily session shall be limited to thirty minutes, and that of each other speaker on the program to twenty minutes; and ten minutes shall be allowed for discussion following each address.

8. For the convenience of the Congress and speakers, a gong will ring once three minutes before the close and twice at the close of the time allotted to each speaker on the program. In the course of discussion and in addresses not entered in the program, the gong will ring once one minute before the close and twice at the close of the time allotted to the speaker under these rules.

9. Any speaker rising to address the Congress who is in the employ, whether by retainer or otherwise, of any interstate or public service corporation, which is interested in the action or subjects of deliberation of this Congress, shall mention the fact and nature of such employment before proceeding to speak.

10. Robert's Rules of Order shall control the decisions of the Chair on all questions of parliamentary procedure.

11. Excepting the decorations provided by the Board of Control, banners shall not be displayed, nor shall printed matter be distributed or sold, in the auditorium without written authority from the Executive Committee.

12. After adoption by the Congress in open session, these rules shall remain in force throughout the Congress, but may be suspended or amended by a two-thirds vote.

**GENERAL OFFICERS
of the
TWENTIETH NATIONAL IRRIGATION CONGRESS**

FRANCIS G. NEWLANDS	President
	Reno, Nevada.
R. INSINGER	First Vice-President
	Spokane, Washington.
J. B. CASE	Second Vice-President
	Abilene, Kansas.
JOHN FAIRWEATHER	Third Vice-President
	Fresno, California.
S. H. LEA	Fourth Vice-President
	Pierre, South Dakota.
RICHARD F. BURGESS	Fifth Vice-President
	El Paso, Texas.
ARTHUR HOOKER	Secretary
	Spokane, Washington.
DR. E. McQUEEN GRAY.....	Foreign Secretary
	Albuquerque, New Mexico.
RICHARD W. YOUNG.....	Chairman Executive Committee
	Salt Lake City, Utah.

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of the
TWENTIETH NATIONAL IRRIGATION CONGRESS**

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Connecticut	Miss Frida Sanford	Derby
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NINETEENTH NATIONAL IRRIGATION CONGRESS

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Montana	R. G. Day	Great Falls
Nebraska	D. S. Dalbey	Beatrice
Nevada	A. H. Barlow	Mason
New Mexico	Forrest McKinley	Las Cruces
New York	R. A. Pearson	Albany
Ohio	W. H. Coles	Troy
Oklahoma	Frank A. Sewell	Texhoma
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Tennessee	L. P. Bellah	Nashville
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Wyoming	A. B. Bartlett	Cheyenne

IRRIGATION CENSUS TABLES

In his address on page 36 Mr. R. P. Teele, in charge of Irrigation Statistics, Bureau of the Census, refers to printed reports containing preliminary census results regarding irrigation, which were available for those desiring them. Much of the information contained in these tables, and certain of the tables, are to be found in Mr. Teele's paper, and for the information of those interested certain of the other tables are here incorporated in this appendix.

The printed report referred to, and from which these tables are taken, is that issued from the Department of Commerce and Labor by the Bureau of the Census, E. Dana Durand, Director, giving preliminary census results of the Thirteenth Census of the United States for irrigation in the arid states, and prepared under the supervision of Le Grand Powers, Chief Statistician for Agriculture, by R. P. Teele, Special Agent in Charge of Irrigation.

This report referred to in its introduction states: "This preliminary statement presents tables summarizing a large part of the statistics of irrigation in the arid states obtained in connection with the Thirteenth Census. The data here printed, together with additional information, will be embodied in a special report of the Census of Irrigation and in the final reports of the Thirteenth Census. It should be noted that the figures here presented are subject to revision after more complete tabulation, though it is not expected that there will be any material modification of the totals or percentages reported."

IRRIGATION—ARID STATES.

THE MAIN RESULTS OF THE CENSUS IRRIGATION INQUIRY FOR THE UNITED STATES AS A WHOLE ARE PRESENTED IN THIS TABLE.

	1909	1899	INCREASE.	
			Amount.	Per cent.
Number of farms in arid and semiarid region.....	11,439,023	11,095,675	343,348	313.0
Approximate land area of arid and semiarid region..... acres	1,161,385,600	1,161,385,600		
Improved land in farms..... acres	1173,433,209	119,709,592	53,723,617	44.9
Total value of farm land.....	\$10,488,460,215	\$3,249,259,472	\$7,239,200,743	222.8
Average value per acre of farm land.....	1 \$26.99	2 \$9.42	\$17.57	186.5
Number of farms irrigated.....	157,862	107,716	50,146	46.6
Area irrigated.....	13,739,499	7,527,690	6,211,809	82.5
Area enterprises were capable of supplying in 1910.....	19,335,711	(3)		
Area included in projects.....	31,112,110	(3)		
Number of independent enterprises.....	154,669	(3)		
Total length of ditches..... miles	1125,615	(3)		
Length of main ditches.....	187,336	(3)		
Length of lateral ditches..... miles	138,279	(3)		
Number of reservoirs.....	16,933	(3)		
Capacity of reservoirs..... acre-feet	112,872,256	(3)		
Number of flowing wells.....	15,070	(3)		
Number of pumped wells.....	114,544	(3)		
Number of pumping plants.....	113,951	(3)		
Engine capacity of pumping plants..... horsepower	1,207,241	(3)		
Area irrigated with pumped water.....	1,478,288	(3)		
Area irrigated from flowing wells.....	1125,590	(3)		
Total cost of irrigation systems.....	1 \$304,699,450	\$67,482,261	\$237,217,189	351.5
Average cost per acre.....	4 \$15.76	\$8.89	\$6.87	77.3
Average annual cost of operation and maintenance.....	\$1.07	\$0.38	\$0.69	181.6

1 1910. 2 1900. 3 Not reported. 4 Based on cost of construction to July 1, 1910, and acreage enterprises were capable of supplying in 1910.

TABLE 8.
ACREAGE IRRIGATED, 1909, CLASSIFIED BY SOURCE OF WATER SUPPLY: ARID STATES.

STATE.	Total.	STREAMS.		WELLS.		Reser-voirs.	LAKES.		Springs.	Total irrigated with pumped water.
		Gravity.	Pumped.	Flowing.	Pumped.		Gravity.	Pumped.		
Arid states	13,739,499	12,783,121	157,728	125,590	308,043	98,193	58,121	12,517	196,186	478,288
Arizona.....	320,051	300,067	7,711	1,489	6,096	487	570	..	3,631	13,807
California.....	2,664,104	2,235,067	29,965	55,818	276,595	16,410	15,896	2,574	31,779	309,134
Colorado.....	2,792,032	2,745,037	13,248	5,171	3,111	16,091	422	634	8,320	16,993
Idaho.....	1,430,848	1,383,718	18,685	1,172	705	732	4,622	1,535	19,679	20,925
Kansas.....	37,479	35,469	20	2	1,959	2	.....	.....	27	1,979
Montana.....	1,679,084	1,624,656	7,963	207	55	22,614	5,617	5	17,967	8,023
Nebraska.....	255,950	234,105	18	..	139	1,002	..	..	886	157
Nevada.....	701,833	661,299	463	150	37	1,38	500	406	38,840	906
New Mexico.....	461,718	397,059	1,533	48,877	5,952	1,272	862	..	6,163	7,485
North Dakota.....	10,248	7,153	1,614	.....	1	1,280	.....	.....	200	1,615
Oklahoma.....	5,402	5,219	50	69	20	..	28	..	16	119
Oregon.....	686,129	643,281	3,585	155	1,305	3,279	22,915	821	10,788	5,711
South Dakota.....	63,248	47,122	540	1,448	8	13,535	200	..	395	548
Texas (exclusive of rice).....	164,283	75,496	59,149	3,710	6,199	6,203	.....	458	13,068	65,806
Utah.....	999,410	954,800	2,559	4,100	300	568	1,671	..	35,412	2,859
Washington.....	334,378	301,341	9,085	3,227	5,437	299	4,698	6,084	4,207	20,606
Wyoming.....	1,133,302	1,112,234	1,540	64	75	14,261	120	..	5,008	1,615

TABLE 9.
IRRIGATION WORKS IN UNITED STATES: 1910.

STATE.	Number of independent enterprises.	LENGTH OF DITCHES			RESERVOIRS.		NUMBER OF WELLS USED FOR IRRIGATION.		PUMPING PLANTS.		
		Total (miles).	Main ditches (miles).	Laterals (miles).	Number.	Capacity (acre-feet).	Flowing.	Pumped.	Number.	Engine capacity (horse-power).	Pump capacity (gallons per minute).
Arid states.....	54,669	125,615	87,336	38,279	6,333	12,872,256	5,070	14,544	13,951	207,241	9,318,755
Arizona.....	1,269	2,614	1,747	867	402	1,348,358	214	470	429	8,608	796,887
California.....	13,970	21,129	12,599	8,530	1,604	743,269	2,361	10,710	9,267	123,590	5,209,175
Colorado.....	9,065	22,721	17,518	5,203	1,984	2,646,501	313	121	206	7,969	296,397
Idaho.....	3,092	12,759	7,662	5,097	243	1,742,303	62	24	58	7,065	278,569
Kansas.....	716	281	239	42	42	31,024	3	939	684	1,112	122,572
Montana.....	5,534	18,934	12,990	5,944	917	579,953	15	10	125	3,511	281,199
Nebraska.....	474	2,725	1,456	1,269	44	2,097	..	66	75	52	4,639
Nevada.....	1,347	3,106	1,908	1,198	111	325,873	19	6	18	486	12,172
New Mexico.....	2,786	5,854	4,637	1,217	522	454,160	673	467	486	13,676	216,236
North Dakota.....	49	126	52	74	22	132,187	..	..	4	2,038	182,115
Oklahoma.....	114	85	54	31	11	22	..	65	68	43	3,099
Oregon.....	3,745	7,715	5,649	2,066	276	1,317,370	51	91	229	3,278	108,897
South Dakota.....	395	1,256	631	625	314	216,205	42	5	9	58	5,284
Texas (exclusive of rice).....	2,130	1,661	939	722	288	72,047	122	1,412	1,799	19,368	1,455,574
Utah.....	2,472	7,562	5,764	1,798	482	588,317	1,138	27	70	1,833	440,000
Washington.....	1,934	3,856	2,558	1,298	156	121,543	55	128	390	13,851	363,411
Wyoming.....	5,377	13,231	10,953	2,298	415	2,550,937	2	3	34	703	142,529

TABLE 10.
COST OF IRRIGATION ENTERPRISES: ARID STATES.

STATE.	COST.			INCREASE.	
	1910	1899	1889	Per cent (1889-1899).	1889-1910
					Amount. Per cent.
Arid states	\$304,699,450	\$67,482,261	\$29,611,000	127.9	\$237,217,189 351.5
Arizona.....	17,651,148	4,438,352	465,000	854.5	13,212,796 297.7
California.....	72,445,669	19,181,610	13,005,000	47.5	53,264,059 277.7
Colorado.....	55,477,350	11,758,703	6,389,000	84.6	43,718,647 371.8
Idaho.....	40,977,671	5,120,399	1,029,000	397.6	35,857,272 700.3
Kansas.....	1,365,563	529,755	(1)	.....	835,808 157.8
Montana.....	22,819,868	4,683,073	1,623,000	188.5	18,136,795 387.3
Nebraska.....	7,765,110	1,310,698	(1)	.....	6,454,412 492.4
Nevada.....	6,664,833	1,537,559	1,251,000	22.9	5,127,274 333.5
New Mexico.....	9,051,087	4,165,312	512,000	713.5	4,885,775 117.3
North Dakota.....	836,482	17,980	(1)	.....	818,502 4,552.3
Oklahoma.....	45,200	21,872	.....	.....	23,328 106.7
Oregon.....	12,689,044	1,843,757	826,000	123.2	10,845,287 588.2
South Dakota.....	3,043,186	284,747	(1)	.....	2,758,439 968.7
Texas (exclusive of rice).....	7,306,830	1,027,608	(1)	.....	6,279,222 611.1
Utah.....	13,844,943	5,865,302	2,780,000	111.0	7,979,641 136.0
Washington.....	15,015,111	1,722,369	197,000	774.3	13,282,742 771.8
Wyoming.....	17,700,355	3,973,165	1,281,000	210.2	13,727,190 345.5
Subhumid region.....	.....	2,319,260	273,000	.....	.....

¹ Included in subhumid region in 1889.

² Not included in total.

TABLE 11

AVERAGE COST OF IRRIGATION ENTERPRISES PER ACRE SERVED:
1910, 1899, AND 1889.

STATE.	1910		1899	1889
	Based on acreage irrigated in 1909.	Based on acreage enterprises were capable of irrigating in 1910.		
Arid states	\$22.18	\$15.76	\$8.89	\$8.15
Arizona	55.15	45.53	23.90	7.07
California	27.19	20.02	13.27	12.95
Colorado	19.87	13.90	7.30	7.15
Idaho	28.64	17.15	3.79	4.74
Kansas	36.44	9.75	22.43	(1)
Montana	13.59	10.35	4.92	4.63
Nebraska	30.34	18.09	7.43	(1)
Nevada	9.50	7.93	2.05	7.58
New Mexico	19.60	14.03	6.40	5.58
North Dakota	81.62	38.17	3.49	(1)
Oklahoma	8.37	6.10	7.13	....
Oregon	18.49	15.28	4.75	4.64
South Dakota	48.12	23.69	6.52	(1)
Texas (exclusive of rice)	44.48	21.45	....	(1)
Utah	13.85	11.07	9.17	10.55
Washington	44.90	31.91	12.71	4.03
Wyoming	15.62	10.80	6.54	3.62
Subhumid region .....	....	....	....	4.07

¹ Included in subhumid region.

TABLE 12

AVERAGE COST PER ACRE FOR OPERATION AND MAINTENANCE:
1909, 1899, AND 1889.

	1909	1899	1889
Arid states	\$1.07	\$0.38	\$1.07
Arizona .....	.91	.82	1.55
California	1.54	(1)	1.60
Colorado .....	.75	.34	.79
Idaho .....	.63	.24	.80
Kansas	1.59	(1)	(2)
Montana .....	.89	.28	.95
Nebraska	1.09	(1)	(2)
Nevada .....	.90	.18	.84
New Mexico	1.35	.82	1.54
North Dakota	3.78	(1)	(2)
Oklahoma .....	.51	(1)	(2)
Oregon .....	.75	.22	.94
South Dakota .....	.64	.23	(2)
Texas (exclusive of rice)	3.25	(1)	(2)
Utah .....	.65	.24	.91
Washington	3.08	(1)	.75
Wyoming .....	.86	(1)	.44
Subhumid states .....	....	.16	1.21

¹ Not reported.² Included in subhumid states, not reported by states.

NEWLANDS RIVER REGULATION BILL

The Newlands River Regulation Bill, S. 122, to which frequent reference was made during the session of the Irrigation Congress, is printed herewith as follows:

SIXTY-SECOND CONGRESS**FIRST SESSION****IN THE SENATE OF THE UNITED STATES.**

April 6, 1911.

Mr. Newlands introduced the following bill; which was read twice and referred to the Committee on Commerce.

A BILL

To create a Board of River Regulation and to provide a fund, for the regulation and control of the flow of navigable rivers in aid of interstate commerce, and as a means to that end to provide for flood prevention and protection and for the beneficial use of flood waters and for water storage and for the protection of watersheds from denudation and erosion and from forest fires and for the cooperation of Government services and bureaus with each other and with States, municipalities, and other local agencies.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sum of fifty million dollars annually for each of the ten years following the first day of July, nineteen hundred and eleven, is hereby reserved, set aside, and appropriated, and made available until expended, out of any moneys not otherwise appropriated, as a special fund in the Treasury, to be known as the "River Regulation Fund," to be used for the regulation of interstate commerce and in aid thereof for examinations and surveys and for the construction of engineering and other works and projects for the regulation and control of the flow of navigable rivers and their tributaries and source streams, and for the standardization of such flow, and for flood prevention and protection, by the establishment, construction, and maintenance of natural and artificial reservoirs for water storage and control, and by the protection of watersheds from denudation and erosion and from forest fires, and by the maintenance and extension of woodland and other protective cover thereon, and by the reclamation of swamp and overflow lands, and by the building of drainage and irrigation works, and by doing all things necessary to provide for any and all beneficial uses of water that will contribute to its conservation or storage in the ground or in surface reservoirs as an aid to the regulation or control of the flow of rivers, and by acquiring, holding, using, and transferring lands and any other property that may be needed for the aforesaid purposes, and by doing such other things as may be specified in this Act or necessary to the accomplishment of the purposes thereof, and by securing the cooperation therein of States, municipalities, and other local agencies, as hereinafter set forth, and for the payment of all expenditures provided for in this Act; the purpose of this Act being river regulation and the control of the volume of water forming the stage of the river from its sources, so as to standardize the river flow, as contradistinguished from and supplemental to channel improvement as heretofore undertaken and provided for under the various Acts commonly known as the river and harbor Acts.

**CREATION AND MEMBERSHIP OF BOARD OF RIVER
REGULATION**

Sec. 2. That a board is hereby created, to be known as the "Board of River Regulation," consisting of the Chief of Engineers of

the United States Army, the Director of the United States Geological Survey, the Forester of the Department of Agriculture, the Director of the Reclamation Service, the Chief of the Bureau of Plant Industry of the Department of Agriculture, the Secretary of the Smithsonian Institution, one civil engineer, one sanitary engineer, and one hydroelectric engineer. The last three shall be appointed by the President and hold office at his pleasure, and they shall each receive an annual compensation of seven thousand five hundred dollars, payable out of the appropriation hereinafter apportioned to the Smithsonian Institution. The members of said board, with the exception of the three members appointed by the President, shall serve as such only during their incumbency in their respective and official positions, and any vacancy on the board shall be filled in the same manner as the original appointment. A chairman and a secretary of the board shall be elected annually by the board from its members.

All formal action taken and all expenditures made or authorized by the board shall be reported to the President of the United States, and shall be by him transmitted to Congress annually, or at such more frequent times as may appear to him desirable, or at such times as Congress may require.

CO-OPERATION WITH STATES, MUNICIPALITIES, AND OTHER AGENCIES

Sec. 3. That the board shall, in all cases where possible and practicable, encourage, promote, and endeavor to secure the co-operation of States, municipalities, public and quasi-public corporations, towns, counties, districts, communities, persons, and associations in the carrying out of the purposes and objects of this Act, and in making the investigations and doing all co-ordinative and constructive work provided for herein; and it shall in each case endeavor to secure the financial co-operation of States and of such local authorities, agencies, and organizations to an extent at least equal in amount to the sum expended by the United States and it shall negotiate and perfect arrangements and plans for the apportionment of work, cost, and benefits, according to the jurisdiction, powers, rights, and benefits of each, respectively, and with a view to assigning to the United States such portion of such development, promotion, regulation, and control as can be properly undertaken by the United States by virtue of its power to regulate interstate and foreign commerce and by reason of its proprietary interest in the public domain, and to the States, municipalities, communities, corporations, and individuals such portion as properly belongs to their jurisdiction, rights, and interests, and with a view to properly apportioning cost and benefits, and with a view to so uniting the plans and works of the United States within its jurisdiction, and of the States and municipalities, respectively, within their jurisdictions, and of corporations, communities and individuals within their respective powers and rights, as to secure the highest development and utilization of the waterways and water resources of the United States.

The board may receive and use any funds or property donated or subscribed to it or in any way provided for co-operative work, but no moneys shall be expended under any arrangement for co-operation until the funds to be provided by all parties to such arrangement shall have been made available for disbursement.

ENCOURAGEMENT OF INDEPENDENT INITIATIVE AND CONSTRUCTION

Sec. 4. That all things done under this Act shall be done with a view not only to constructive co-operation, as herein provided, but also with the definite and specific object of enlarging the field of accomplishment contemplated by the Act through promoting and encouraging

independent initiative and construction by States, municipalities, districts, and other local agencies and organizations, and creating object lessons and building models and making demonstrations that will have that effect and influence, and induce such supplemental and independent action and construction.

CONFERENCE AND CO-OPERATION OF BUREAUS AND STATES

Sec. 5. That it shall be the duty of said board to co-ordinate and bring into conference and co-operation the various scientific and constructive bureaus of the United States with each other and with the representatives of States, municipalities, public and quasi-public corporations, towns, counties, districts, communities, and associations in the carrying out and accomplishment of all the provisions, purposes, and objects of this Act.

The board shall have authority to call upon and to bring into co-operation any other Federal department or bureau whose investigations or assistance may be found necessary to the carrying out of the provisions of this Act, and the board is hereby authorized to defray the expenses of such investigations or assistance through a transfer of so much of its appropriation as may be necessary to the Federal department or bureau thus brought into co-operation.

CORRELATION, CO-ORDINATION, AND ADMINISTRATIVE ECONOMY

Sec. 6. That the board shall harmonize and unify and bring into correlation and co-ordination the investigations made, and information, data, and facts collected and obtained by the various bureaus or offices of the Government relating to or connected with the matters and subjects referred to and the questions involved in this Act, and to print, publish, and disseminate the same, and it shall exercise such general supervision as may be necessary to provide against duplication or unnecessary, inadequate, unrelated, or incomplete work in connection therewith, and shall make such recommendations to the President as it may deem advisable at any time for the accomplishment of that end or in the interest of harmonious co-operation, efficiency, and economy in carrying out the purposes of this Act. The special function of the board at all times shall be to promote the adoption of the best and most approved methods and systems of investigation, administration, construction, and operation, in carrying out such specific improvements, works, and projects as are authorized by this Act, or which may be from time to time authorized by Congress, if within the scope of the work of the said board as herein set forth; and it shall further be the special function of the board to effect the largest possible saving as the result of the unification, correlation, and co-ordination of the work of the various bureaus in the investigations and administrative and constructive work provided for in this Act in accordance with existing law or with such provisions as Congress shall from time to time impose.

REPORTS, PLANS, AND ESTIMATES BY THE BOARD

Sec. 7. That the functions of the board shall be to obtain full information through its members concerning all proposed expenditures provided for within the scope of this Act. Each bureau chief member shall report to the board the work proposed by the bureau or organization which he represents, and shall present full plans and estimates covering such proposed construction or action. The findings and conclusions of the board and plans adopted by it for construction and action shall be binding upon the members thereof in so far as may be consistent with existing laws.

REFERENCES TO AND INSTRUCTIONS FROM THE PRESIDENT

Sec. 8. That all matters involving apparent conflict with departmental authority, jurisdiction, or procedure, or as to which the board may desire suggestions or advice, shall be laid before the President, who may thereupon call into conference the Secretaries of the departments represented on said board, and thereafter suitable instructions shall be issued by him to heads of departments with a view to securing unity of action along the lines approved by the President.

EXECUTION OF PLANS AND WORK BY THE SEVERAL BUREAUS

Sec. 9. That in the execution of all plans and duties intrusted or delegated to the several bureaus the respective chiefs thereof, acting under departmental regulations and procedure, shall execute the work according to the methods prescribed by law, the functions of the board being those of a consulting and advisory body with power to make recommendations to the President, and through the President to the heads of departments, with a view to effective co-ordination and co-operation as to all things proposed by this Act, and to carry out such work as Congress shall from time to time prescribe or has prescribed in this Act.

COMPREHENSIVE PLANS FOR RIVER REGULATION

Sec. 10. That the board shall develop, formulate, prepare, consider, and determine upon comprehensive plans for the conservation, use, and development of the water and forest resources of the United States in such manner as will best regulate the flow of source streams and navigable rivers, and embracing, with that object, flood protection, drainage, and the reclamation of swamp and overflow lands; water storage in natural and artificial reservoirs; the beneficial use of waters for irrigation and for all domestic, municipal, and industrial purposes; the maintenance and development of underground water supplies and the storage of waters in the ground and in irrigated lands and underground reservoirs; the enlargement of the areas and raising of the levels of the ground waters; the construction of flood-water canals, by-passes, and restraining dams; the control and regulation of drainage and the replenishment of streams by return seepage; the perpetuation of forests and maintenance of woodland cover as sources of stream flow; the prevention of denudation and erosion; the protection of river channels from eroded soil materials; the clarification of streams; the utilization of water power; the prevention of the pollution of streams and rivers; the sanitary disposal of sewage and purification of water supplies; the best distribution of forests, woodlands, and other growth, and of cultivated and irrigated areas in their relation to river flow; the protection of forested and woodland areas from destruction by fire or insects; the reforestation of denuded areas; the planting of forests and establishment of forest plantations; the preservation and planting of woodlands and any other growth and protective cover on watersheds; the increase and development of the porosity and absorbent qualities and storage capacity of the soil upon which rain or snow may fall; the making and furnishing of plans for flood-water storage and other works for irrigation and power for farms, towns, and villages; the acquisition, subdivision, and settlement in small, intensively cultivated farms of lands for water storage by irrigation; the building of the irrigation systems for such lands, including reservoirs, dams, canals, ditches, and all necessary works; the protection of farms, villages, towns, and municipalities from damage by freshets and overflow; and the impounding of flood waters in artificial lakes and storage reservoirs to prevent floods and overflows, erosion of river banks, and breaks in levees, and to regulate the flow of streams and re-enforce

such flow during drought and low-water periods, the ultimate object of all such work being to regulate and, so far as possible, standardize the flow of navigable rivers and source streams, and in the accomplishment of that object to induce and secure the co-operation of States, municipalities, districts, counties, towns, and other local agencies and organizations.

SMITHSONIAN INSTITUTION

Sec. 11. That it shall be the duty of the Secretary of the Smithsonian Institution to give especial attention to the acquisition from foreign countries and from all sources of all obtainable knowledge concerning the problems involved in the work of the board and to diffuse and disseminate the same, and to establish and maintain a Museum of Conservation in which such knowledge shall be placed before the people, with object lessons illustrating the disastrous consequences that have resulted from the failure of such conservation and particularly the failure to conserve the forest and water resources in other countries of the world, and to utilize the resources of the institution under his charge, which may be available for that purpose, to aid in the education of the public in the elements of knowledge which lead to the successful regulation of water and of the flow of rivers and the use of water in connection with agriculture and the intensive cultivation of land, and in connection with all other industries.

BUREAU OF PLANT INDUSTRY

Sec. 12. That it shall be the duty of the Chief of the Bureau of Plant Industry to collate and bring together for the information of the board the results of all investigations with reference to soil and the production of crops through the use of water as a fertilizer and stimulant to plant growth, and of the relation of water in excess or deficiency to successful crop production. He shall recommend for the consideration of the board such further investigations as may properly be conducted in connection with the purposes for which the board is created and which shall lead to the largest and most valuable results being obtained through the use of water in connection with successful plant growth and increased crop production, and the establishment of a national system for the information of the people in the intensive cultivation of small tracts of land, with a view to increasing food production and thereby reducing the cost of living and encouraging suburban and rural settlement and homemaking, and the beneficial use of water in connection therewith.

FOREST SERVICE

Sec. 13. That it shall be the duty of the Forester of the Department of Agriculture to present to the board all essential facts bearing upon the relation of forests to the various problems under consideration and the value and importance of forests and woodland and other growth upon the headwaters of streams and their proper control and extension and protection from fire, as regulators of stream flow; also such facts as may be essential to the proper enlargement of forested areas for the protection of watersheds and the maintenance of the flow of rivers during the low-water season and the prevention of denudation and erosion, with consequent silting up of channels, and to prepare and present to the board comprehensive plans for the protection of the forests from fire and other destructive agencies.

GEOLOGICAL SURVEY

Sec. 14. That it shall be the duty of the Director of the Geological Survey to recommend to the board appropriate surveys and examinations, and upon proper approval cause to be executed topographic

surveys of each drainage basin, these being planned with reference to the work contemplated by the board and the immediate demands and needs of the board. Such surveys shall include and show in addition to the topography the character of all lands embraced therein and it shall be his duty to classify the same and designate the best use to which said lands may be devoted in carrying out the provisions of this Act. The topographic maps shall be of such scale as will bring out the existence of feasible storage or reservoir sites, and he shall make such additional surveys of specific localities as may be required by the constructing engineers, and in such surveys he shall establish monuments based on geodetic horizontal and vertical control. And the surveys shall be of such nature as to provide adequate bases for geologic investigation and engineering works. He shall also cause measurements to be made of the flow of streams at such places as may be designated by the board as yielding results of largest importance in the discussion of the problems in hand and the execution of proposed engineering works, and shall carry on such studies in river pollution and purification, in water-power possibilities, and other stream investigations as the board may designate. It shall be his further duty to examine all forested lands or lands intended to be afforested or reforested which it is proposed to purchase under this Act, and to report upon whether the control and use of such lands will influence the preservation of water supplies or stream flow or tend to regulate the flow of navigable rivers on whose watersheds they are located.

RECLAMATION SERVICE

Sec. 15. That it shall be the duty of the Director of the Reclamation Service to bring before the board the results attained in the construction of works of irrigation and reclamation throughout the arid and semi-arid regions of the United States and the application of the experience thus obtained to the conditions existing in the more humid sections of the United States. He shall extend the surveys and investigations and construction of irrigation works such as are authorized in the Act of June seventeenth, nineteen hundred and two, known as the National Irrigation Act, throughout the United States and including reclamation of land by drainage as well as by irrigation: **Provided, however,** That no part of the fund created by the Act of June seventeenth, nineteen hundred and two, shall be expended for this purpose. Such further investigations and construction and operations in States other than those covered by the original Act above referred to shall be subject to the terms, provisions, and requirements of the said National Irrigation Act that may be applicable thereto, but shall be at the expense of the River Regulation Fund created by this Act, and expenditures from said last-mentioned fund may be made in any State or Territory. He shall construct, operate, and maintain, until otherwise provided by law, such irrigation works and systems as the board may determine are needed for the regulation of the streams and rivers and the improvement of agricultural conditions, or for the proper control, disposition, and utilization of sewage or other waste waters which, without such regulation, would pollute the streams or injuriously affect the health or prosperity of the community. He shall also present to the board proposed plans for co-operation with irrigation or drainage projects or enterprises constructed, initiated, or contemplated by States, districts, municipalities, corporations, associations, or individuals, and shall negotiate agreements for co-ordinating and making more useful works already in existence or proposed through their incorporation into more effective systems.

CORPS OF ENGINEERS, UNITED STATES ARMY

Sec. 16. That the Chief of Engineers of the United States Army shall present to the board all proposed plans for levees, dikes, revet-

ments, bank-protective and drainage works, and other works for river improvement which are proposed to be built under this Act, and also all plans for the construction of reservoirs for the storage of flood waters, for flood prevention and river control which may be proposed to be built under this Act, or for which examinations and surveys have been made by or with the co-operation of States, municipalities, or districts, and which it is sought to have constructed under this Act, together with such facts and data as may be required for the construction of such works, or any of them, for the regulation of the flow of rivers. He shall also construct, operate, and maintain such levees, flood protection and drainage works and reservoirs as are built in accordance with this Act for the storage of water to control and regulate the flow of rivers, and to re-enforce such flow in seasons of low water and to prevent floods and protect lands and communities from overflow: **Provided, however,** That the provisions of this section shall be so administered as in no way to supersede or conflict with any specific provisions which Congress shall from time to time make by way of appropriations other than such as are made by this Act for work and improvements to be performed or maintained by the Corps of Engineers, United States Army, but that all work prescribed under this section shall be supplemental to and co-ordinated with the work as specifically prescribed by Congress in other Acts.

ENGINEER APPOINTEES OF THE PRESIDENT

Sec. 17. That it shall be the duty of the three engineers appointed by the President under the direction of the board to consider and present comprehensive plans for the best utilization of the water resources of the United States in connection with river regulation along their respective lines, namely: Questions relating to general construction work; to water pollution, water purification, health, and sanitation; and to water-power problems; and to adjust all the plans contemplated for the projects constructed under this Act to the central controlling purpose of regulating and standardizing the flow of the rivers of the United States, and to further give expert advice to the board in its consideration of details, problems, and projects; and it shall be their special duty to constantly promote and stimulate harmonious and effective co-operation between the Nation and States, municipalities, and other local agencies in working out constructive plans under this Act. And it shall further be their special duty to carefully scrutinize and study the plans presented to the board for consideration, with the view of promoting the fullest possible measure of efficiency and economy in administration and construction, and avoiding all duplication in the work of the respective bureaus.

EQUITABLE APPORTIONMENT AMONG WATERWAY SYSTEMS

Sec. 18. That in carrying out the provisions of this Act regard must be had, as far as practicable, to the equitable apportionment and contemporaneous execution of the works and projects contemplated under this Act among the several waterway systems of the United States.

REPLENISHMENT OF RIVER REGULATION FUND BY BOND ISSUE

Sec. 19. That the President is authorized, whenever the current revenues are insufficient to provide the fifty million dollars appropriated for the River Regulation Fund, to make up the deficiency in such fund by the issue and sale of United States bonds, bearing interest at a rate not exceeding three per centum per annum, payable semi-annually, and running for a period not exceeding thirty years.

APPROPRIATIONS AND APPORTIONMENT

Sec. 20. That the moneys hereby annually appropriated in section one of this Act shall be apportioned and expended by the services and bureaus herein named in carrying out the purposes and provisions of this Act and under the direction of the heads of the respective departments and in accordance with existing laws and regulations or such modifications thereof as may be made from time to time in accordance with the general system proposed by the board and approved by the President of the United States, in the following sums annually, which shall be available until expended:

For the Smithsonian Institution, for obtaining information and material relating to the subjects covered by this Act in the United States and foreign countries, and publishing and distributing the same to the people of the United States, and for the establishment and maintenance of a Museum of Conservation of Forest and Water Resources, and for any other purposes mentioned or referred to in section eleven of this Act, one million dollars.

For the Bureau of Plant Industry, for the establishment and maintenance of garden schools and demonstration garden farms, and instruction in irrigation in model rural industrial communities, and for investigations and instruction with reference to terracing and methods of cultivation on hillside slopes adapted to preventing erosion, and with reference to the use of water as a fertilizer and stimulant to plant growth, and for the acquisition of lands that may be required for such purposes, and for any other purposes mentioned or referred to in section twelve of this Act, two million dollars.

For the Geological Survey, for topographic surveys and the measurement of streams and other hydrographic and hydrologic works, and for the examination of lands intended to be purchased under this Act, and for any other things required by the board to be done in connection with any investigation or construction done under this Act, three million dollars.

For the Reclamation Service, for the building of irrigation systems to aid in the regulation of the flow of source streams or navigable rivers through the conservation, utilization, and ground storage of waters in irrigated lands, and for the acquisition and reclamation by irrigation or drainage of specific tracts of lands for intensive cultivation and settlement, and for the building of canals and ditches, and carrying to completion any and all methods of utilizing water for irrigation as a means for river regulation, and for any other purpose mentioned or referred to in section fifteen of this Act, ten million dollars.

For the Forest Service, (a) for the protection from fire and insect infestation of national forests, where such protection is essential to the preservation and maintenance of water supplies, and for the acquisition of lands within or near existing national forests or other lands which are necessary to the adequate protection of water supplies, and for building the necessary roads, trails, fire lines, fire protection stations, telephone lines, and for any and all other things required for such fire protection, including the fighting of fires and the employment of forest guards and rangers, three million dollars.

(b) For the protection from fire of the forested watersheds of navigable streams, for the organization and maintenance of a system of fire protection on any private or State forest lands situated upon the watershed of a navigable river, in co-operation with any State or group of States, as provided for in an Act entitled "An Act to enable any State to co-operate with any other State or States, or with the United States, for the protection of the watersheds of navigable streams and to appoint a commission for the acquisition of lands for the purpose of conserving the navigability of rivers," known as the Appalachian National Forest Act, and also in direct co-operation with cities, counties,

towns, villages, and other owners of woodlands and forested areas on watersheds, and wherever essential to the preservation of water supplies and for the protection of such forested watersheds and areas from insect infestation, one million dollars.

(c) For the protection, perpetuation, enlargement, maintenance, regulation, and control of water supplies by the establishment and maintenance of forest nurseries, the planting or replanting of forests, the reforestation of denuded areas, the carrying out of silvicultural improvements in the national forests, and the establishment and maintenance of forest plantations and parks and the acquisition of lands therefor to provide instruction in the planting and care of trees and forests for the purpose of awakening and maintaining a local interest in and knowledge of the relation of forests to the preservation of water supplies and stream flow, one million dollars.

(d) For the acquisition of forest lands by and through the National Forest Reservation Commission as and in the manner provided for in the Appalachian National Forest Act above referred to, subject to all the conditions and requirements contained in said Act, five million dollars.

Provided, That the provisions of the said Appalachian National Forest Act shall, after the expiration thereof by limitation, still continue and be in force with reference to all moneys made available for expenditure thereunder by this Act, either for fire protection or for the acquisition of forest lands.

For the Corps of Engineers, United States Army, for building and maintaining revetments, dikes, walls, levees, embankments, gates, wasteways, by-passes, flood-water canals, restraining dams, impounding basins, and bank-protective works for river regulation, and, as a means to that end, the building of works for reclamation, drainage, and flood protection, and for building reservoirs and artificial lakes and basins for the storage of flood waters to prevent and protect against floods and overflows, erosion of river banks, and breaks in levees, and to regulate the flow of source streams and navigable rivers, and re-enforce such flow during drought and low-water periods, and for the operation and maintenance of the same, twenty-four million dollars.

FINANCIAL STATEMENT
of the
SECRETARY AND TREASURER
of the
NINETEENTH NATIONAL IRRIGATION CONGRESS
Chicago, Ill., Jan. 1, 1912

Mr. R. Insinger, Chairman Board of Governors,
Nineteenth National Irrigation Congress,
Spokane, Washington.

Dear Sir:

I submit herewith the Financial Statement of the Nineteenth National Irrigation Congress covering the period from Oct. 1, 1910, to Jan. 1, 1912, as follows:

CASH AND RECEIPTS.

1910.				
Oct	1	Grand Total Balance (see report of Auditing Committee, p. 404, Eighteenth Official Proceedings)	\$ 748.40	
"	7	W J McGee, 1911 Permanent Delegate dues	5.00	
Dec.	3	Chicago guarantee deposit	7,500.00	
"	21	Frederick Conlin, 1911 Permanent Delegate dues, No. C-35..	10.00	
1911				
Feb.	6	R. McLean Merc. Co., postage	1.00	
Apr.	15	R. H. Agur.....1911 Permanent Delegate dues, No. C-19,	5.00	
July	17	R. Insinger....." " " " " " C- 9,	5.00	
Aug.	14	E. C. Leedy....." " " " " " C-30,	5.00	
Aug.	15	Howard Elliott....." " " " " " C-11,	5.00	
Aug.	22	Edwin T. Coman....." " " " " " C- 6,	5.00	
"	22	C. H. Hammett....." " " " " " C- 8,	5.00	
"	22	W. E. Quinlan....." " " " " " C-22,	5.00	
"	22	L. Newman....." " " " " " C-23,	5.00	
"	22	Jno. Henry Smith....." " " " " " C-28,	5.00	
"	22	Gaspar Giron....." " " " " " C-29,	5.00	
"	22	Fred J. Kiesel....." " " " " " C-31,	5.00	
"	22	R. B. Bennett....." " " " " " C-18,	5.00	
"	22	Geo. C. Pardee....." " " " " " C-27,	5.00	
"	22	W. H. Cowles....." " " " " " C-12,	5.00	
Sept.	11	J. B. Case....." " " " " " C-33,	5.00	
"	11	Chas. A. O'Connor....." " " " " " C-32,	5.00	
Oct.	3	V. W. Helm....." " " " " " C-36,	10.00	
"	23	Norman S. Rankin....." " " " " " C-37,	10.00	
Nov.	13	Alvin P. Kletzsch....." " " " " " C-38,	10.00	
"	13	Alvin P. Kletzsch.....1912 " " " " " " D-38,	5.00	
"	13	S. G. Stoney....." " " " " " D-14,	5.00	
"	13	E. F. Bohm.....1911 " " " " " " C- 5,	5.00	
Nov.	24	Felix Martinez....." " " " " " C-16,	5.00	
Dec.	1	W. A. Insinger....." " " " " " C-17,	5.00	
"	1	H. C. Nutt....." " " " " " C-20,	5.00	
"	1	W. L. Powers....." " " " " " C-39,	10.00	
"	1	R. B. Marshall....." " " " " " C-40,	10.00	
"	29	Official Proceedings.....	2.00	
Total cash and receipts October 1, 1910, to January 1, 1912..				\$8,426.40

EXPENDITURES.

EXPENDED ON VOUCHERS 0 TO 53 INCLUSIVE:			
Traveling and other expenses Board of Governors	\$1,984.60		
Moving Headquarters from Pueblo to Chicago	400.00		
Moving Headquarters from Chicago to Salt Lake City	400.00		
Secretary's salary for 15 months, October 1, 1910, to January 1, 1912.	4,450.00		
Director of Publicity	290.50		
Miscellaneous traveling expenses	260.75		
Miscellaneous expenses and supplies	142.23		
Cost of Treasurer's \$5,000 bond	25.00		
Total expenditures, October 1, 1910, to January 1, 1912.....		\$7,953.08	
Balance January 1, 1912.....			\$ 473.32

Respectfully submitted,
(Signed) ARTHUR HOOKER, Secretary and Treasurer.

REPORT OF AUDITING COMMITTEE

Chicago, Ill., January 11, 1912.

Mr. R. Insinger, Chairman Board of Governors,
Nineteenth National Irrigation Congress,
Spokane, Washington.

Dear Sir: We, the undersigned, Frank E. Scott and W. F. Van Buskirk, selected under a resolution adopted by the Board of Governors of the Nineteenth National Irrigation Congress at their meeting at the Auditorium Theatre in Chicago on the morning of Saturday, December 9, 1911, to audit the Treasurer's books, hereby certify that we have examined the accounts and vouchers of the Treasurer's office and find them to show receipts, expenditures and balances as follows:

CASH AND RECEIPTS

Oct. 1, 1910, Grand Total Balance (See report of Auditing Committee, page 404 Eighteenth Official Proceedings)	\$	748.40	
Dec. 3, 1910, Chicago Guarantee Deposit.....		7,500.00	
Feb. 6, 1911, Postage.....		1.00	
Dec. 29, 1911, Official Proceedings.....		2.00	
Jan. 1, 1912, Permanent Delegates' dues paid in from Oct. 7, 1910, to Jan. 1, 1912.....	175.00		\$8,426.40

EXPENDITURES

Expenditures, Oct. 1, 1910, to Dec. 30, 1911.....	\$7,953.08	
Balance on hand January 1, 1912.....		\$473.32

And we certify that all expenditures have been made upon vouchers duly approved by the Board of Governors through their Chairman or Vice Chairman, and Secretary.

(Signed)

FRANK E. SCOTT,
W. F. VAN BUSKIRK,
Members Auditing Committee.

AUDIT OF BOARD OF CONTROL ACCOUNTS

Marwick, Mitchell, Peat & Co.

Chartered Accountants,

115 South LaSalle Street, Chicago, January 5, 1912.

Homer A. Stillwell, Esq., Chairman Finance Committee,

Chicago Board of Control,

Nineteenth National Irrigation Congress,

Chicago, Illinois.

Dear Sir:

In accordance with your instructions, we have examined the accounts of the Board of Control of the Nineteenth National Irrigation Congress, from October 1, 1910, to December 30, 1911, on which we now submit our report, together with a statement of receipts and expenditures during the period.

The objects of the Congress as set forth in its constitution are "(1) To promote and diffuse knowledge concerning irrigation and other uses of water; especially throughout the more arid portions of the United States; (2) to facilitate conference and deliberation among the people of the country concerning irrigation and related interests; and (3) to provide means for bringing the needs of the people and the country before state and federal governments." Special attention was given at the meeting this year to the reclamation of swamp and overflow lands of the country, which subject is of unusual interest to the State of Illinois and the Mississippi Valley.

For the purpose of holding the Congress in Chicago, contributions were solicited from firms and business houses located there and in

neighboring territory whose interests lay in the promotion of the objects of the Congress.

The receipts and expenditures, of which particulars are recorded in Exhibit "A", may be summarized as follows:

Receipts	\$ 31,102.25
Expenditures	26,890.98
Excess of Receipts over Expenditures.....	4,211.27
Represented by:	
Cash in Bank	4,211.27

All contributions reported as collected were duly deposited in the Continental and Commercial National Bank. We have obtained a certificate of the funds in their hands at December 30, 1911, which agrees with the balance shown on the books.

We examined all checks for expenditures, which have been signed by the Treasurer in conjunction with one of three authorized parties. Duly approved vouchers for all expenditures were produced for our inspection.

In order that the requisite arrangements could be made to hold the Congress in Chicago the Chicago representatives guaranteed the Board of Governors the sum of \$7,500.00 wherewith to meet the preliminary expense. This amount was placed in the hands of Mr. Arthur Hooker, Secretary and Treasurer, and we are informed that the Board of Governors have already expended a sum in excess of the amount guaranteed. We have not examined the vouchers covering these expenditures.

We understand that additional expenditures will be incurred, principally in the preparation of the report of the proceedings of the Congress, but no provision has been made in respect of these liabilities.

Yours truly,

(Signed) MARWICK, MITCHELL, PEAT & CO.,
Chartered Accountants.

EXHIBIT "A"

RECEIPTS AND EXPENDITURES

From October 1, 1910, to December 30, 1911.

Receipts:	
Contributions	\$31,102.25
Expenditures:	
Salaries:	
Managing Director	\$ 2,000.00
Director of Publicity	1,375.00
Stenographers, etc.	3,944.04
	<u>7,319.04</u>
Office Expenses and Supplies.....	1,601.21
Printing and Stationery.....	1,282.49
Postage	1,944.61
Foreign Secretary's Expenses.....	652.51
Interest	359.39
Miscellaneous Expenses	973.09
Furniture and Fixtures.....	392.75
Traveling Expenses	416.04
Entertainment	649.85
Rent of Halls for Convention.....	3,800.00
	<u>\$19,390.98</u>
Guarantee Fund in Hands of Board of Governors, to be accounted for by them.....	7,500.00
	<u>\$26,890.98</u>
Cash on Hand	4,211.27
	31,102.25

ESTIMATED ADDITIONAL EXPENSES

The report of Marwick, Mitchell, Peat & Co., including "Exhibit A," above, is brought down only to Dec. 30, 1911. In order to present as nearly complete as possible a statement of expenses, the expenses in connection with publishing and mailing the official proceedings of the Nineteenth National Irrigation Congress, together with stenographic help and miscellaneous expenses in maintaining the headquarters from January 1, 1912, to approximately February 1, 1912, are estimated as follows:

Official proceedings	\$1650.00	
Postage	600.00	
Stenographic help and miscellaneous expenses....	215.00	
		\$2,465.00



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