

# **Dam Politics, Dam Safety: The St. Francis Dam Disaster and the Boulder Canyon Project Act**

**DC Jackson**

**Cornelia F. Hugel Professor of History  
Lafayette College**

1



# Boulder/Hoover Dam 1931-35



# Boulder/Hoover Dam

## Is it about Las Vegas?





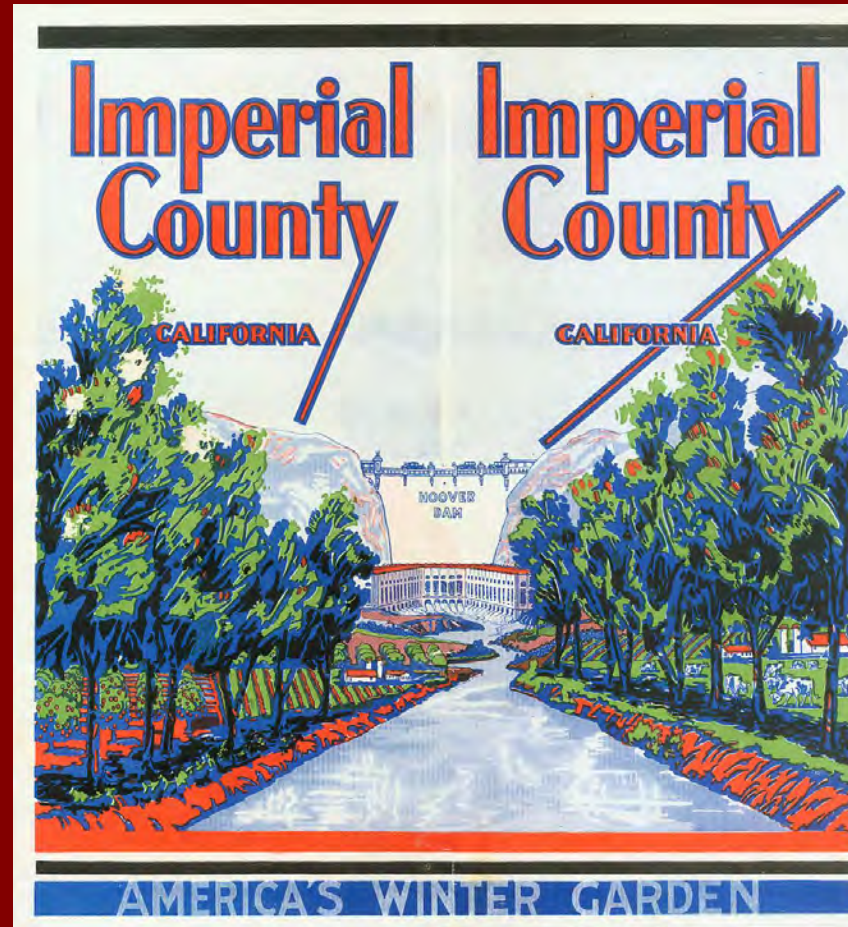
# Boulder/Hoover Dam

## Is it about Las Vegas? Or Not?





# Boulder/Hoover Dam Origins: California's Imperial Valley





# Boulder/Hoover Dam

## But it's really about Los Angeles!





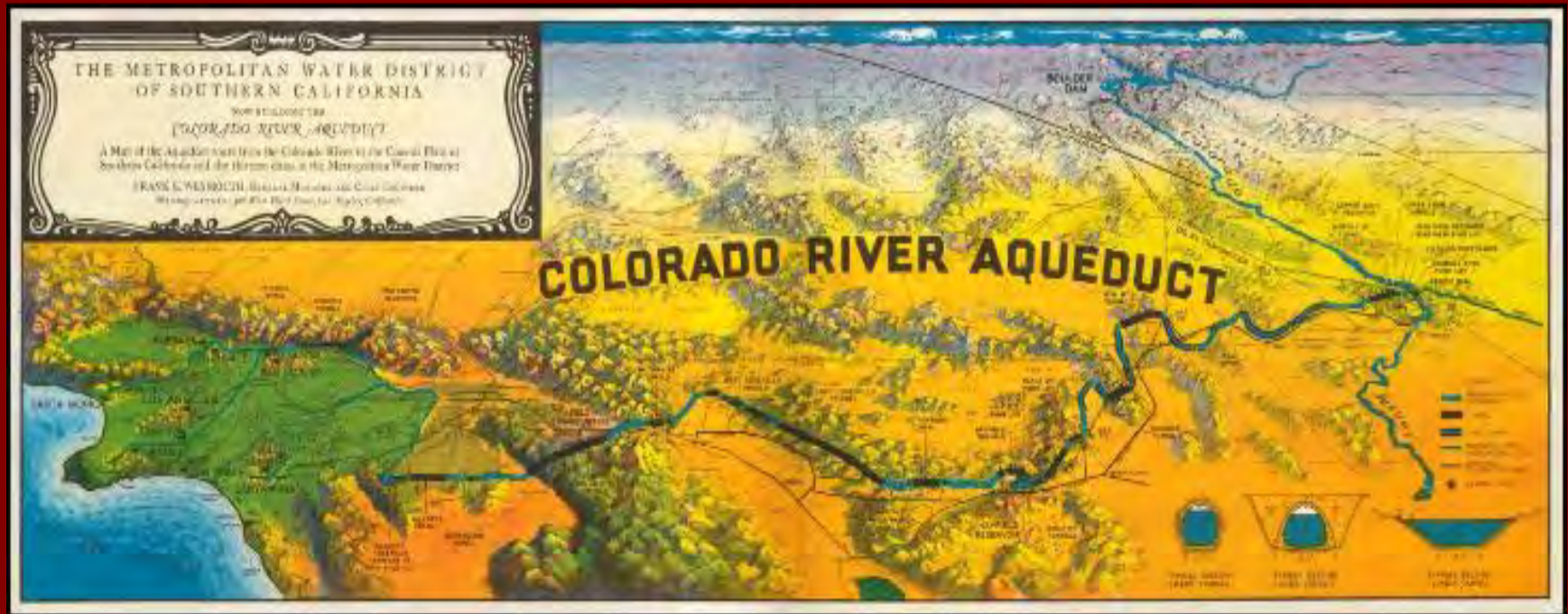
# Boulder/Hoover Dam And the Greater Urban Southland





# Boulder/Hoover Dam

## It's about SoCal and the Colorado River Aqueduct!





# Boulder/Hoover Dam

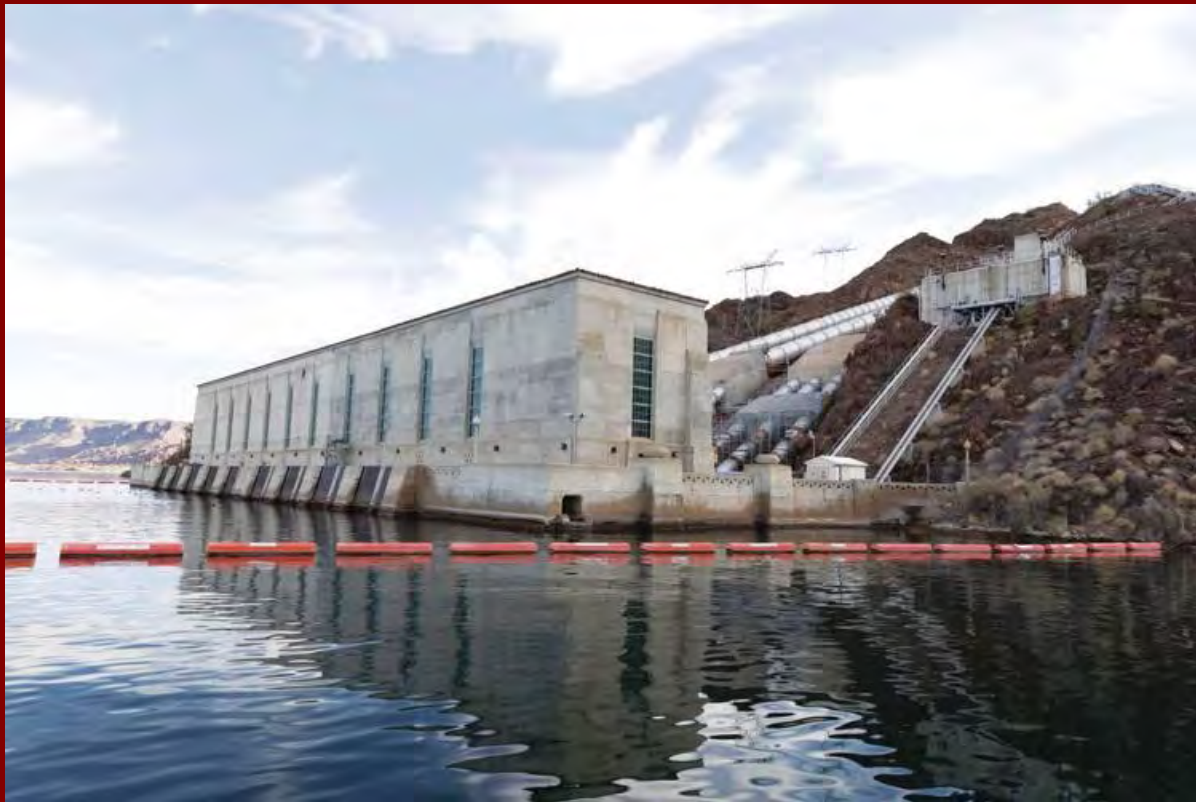
**Hydroelectricity needed to pump water...**



# Boulder/Hoover Dam

## Metropolitan Water District of SoCal

### Whitsett Intake Pumping Plant





# William Mulholland

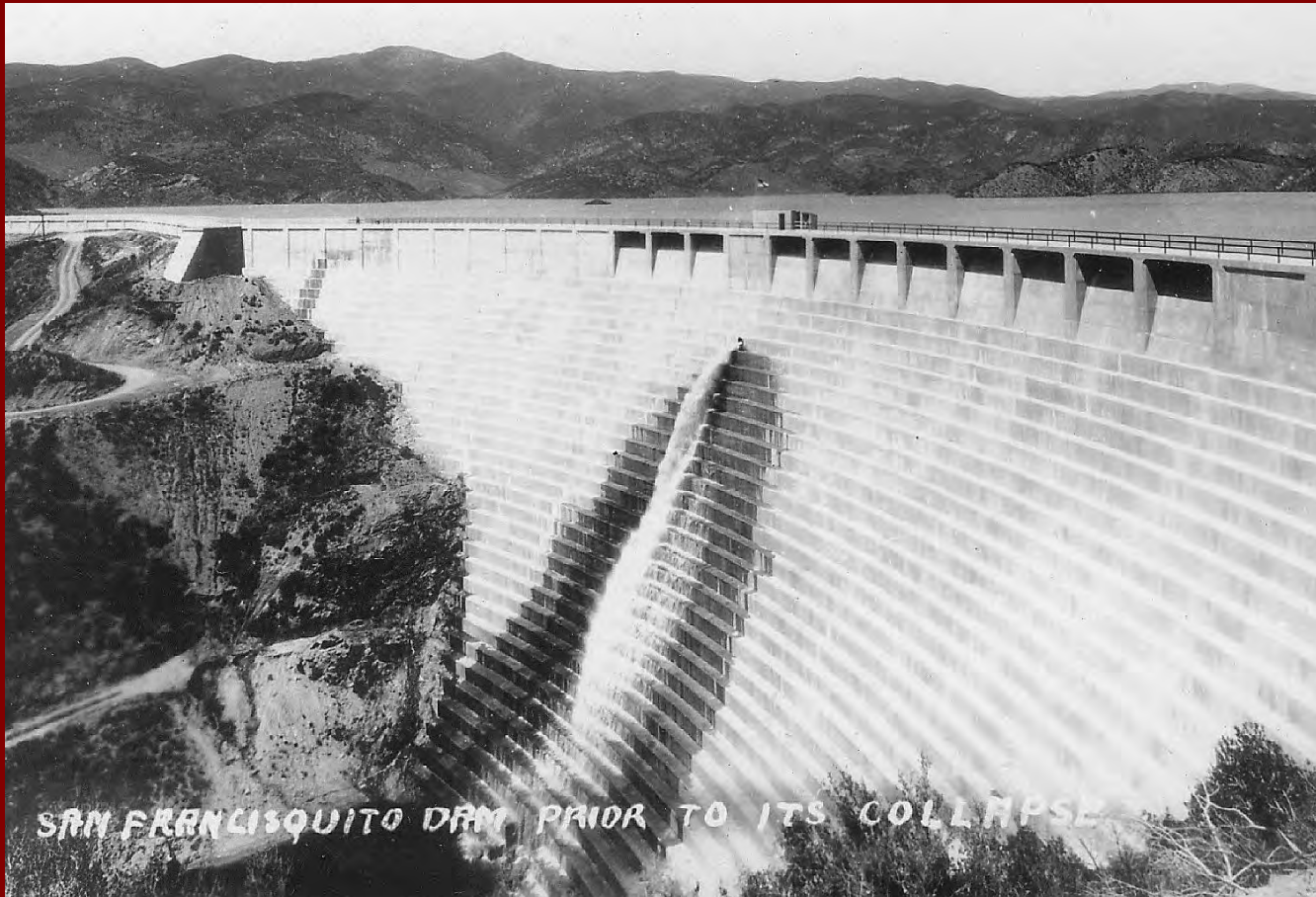
## Chief Engineer - Los Angeles BWS

### Planned Colorado River Aqueduct



# William Mulholland

**Designed/Built St. Francis Dam 1924-26**





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# **Dam Technology & Politics...**

## **Boulder/Hoover & St. Francis Dams**

**A Story of Dam Technology**

**A Story of Dam Politics**

**Also a Story of  
Professional Responsibility**

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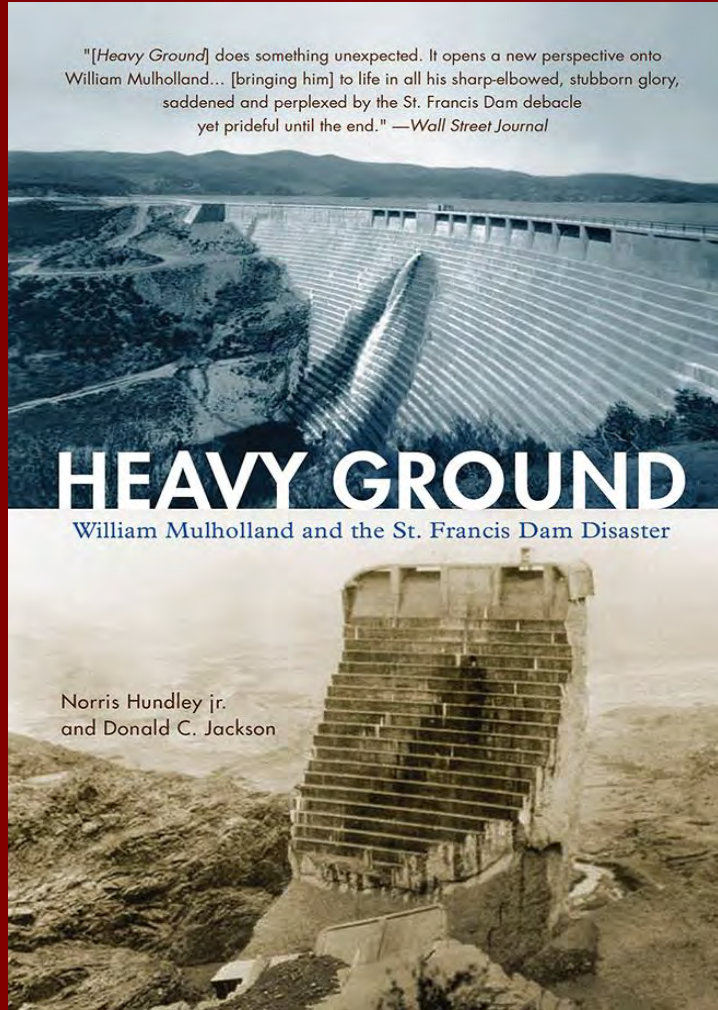
# St. Francis Dam Disaster

"[*Heavy Ground*] does something unexpected. It opens a new perspective onto William Mulholland... [bringing him] to life in all his sharp-elbowed, stubborn glory, saddened and perplexed by the St. Francis Dam debacle yet prideful until the end." —*Wall Street Journal*

## HEAVY GROUND

William Mulholland and the St. Francis Dam Disaster

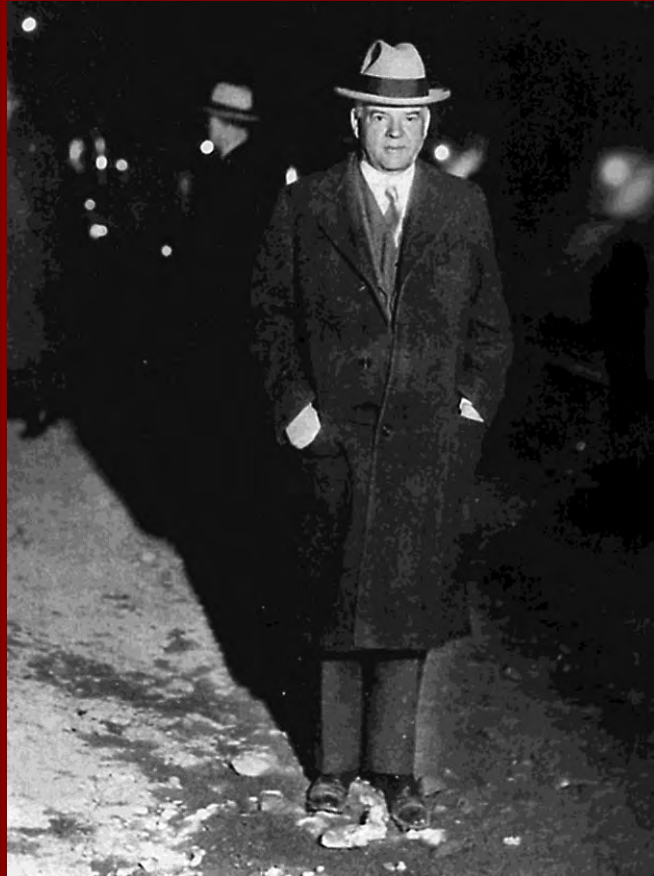
Norris Hundley jr.  
and Donald C. Jackson





# Politics and Dams...

## President Hoover at Hoover Dam - 1932



# Politics and Dams...

**FDR dedicates Boulder Dam - 1935**





# Politics and Dams...

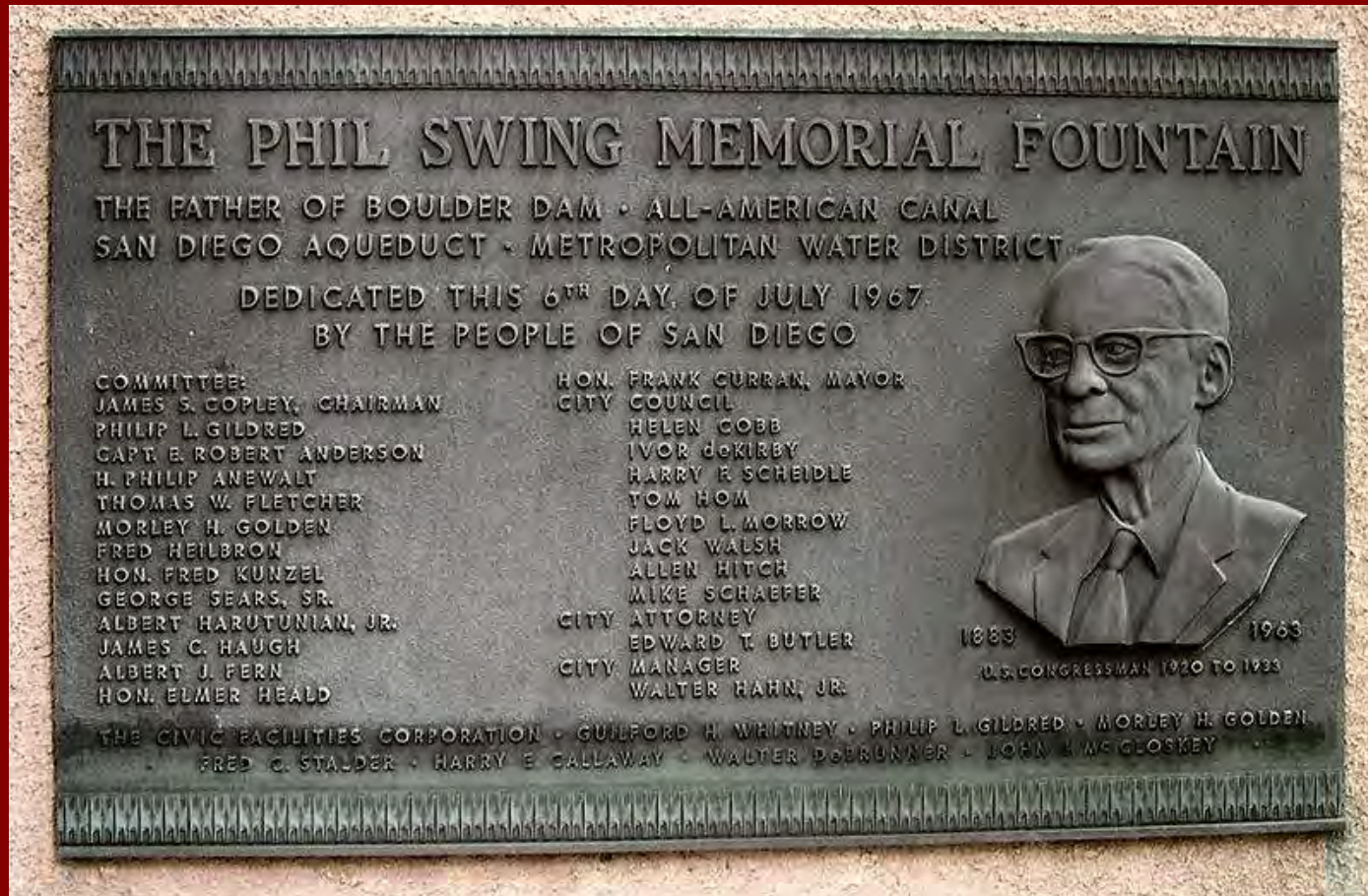
**Obama at Hoover Dam Oct 2, 2012**

**Who built that?**



# Boulder Dam Politics

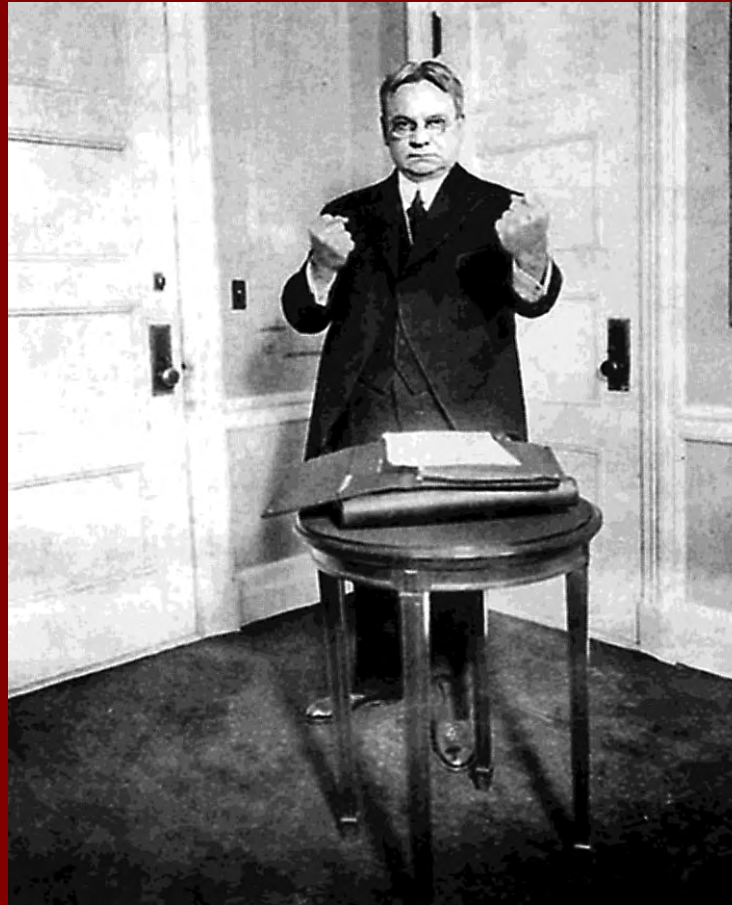
## Phil Swing – California Congressman





# Boulder Dam Politics

**Hiram Johnson – California Senator**



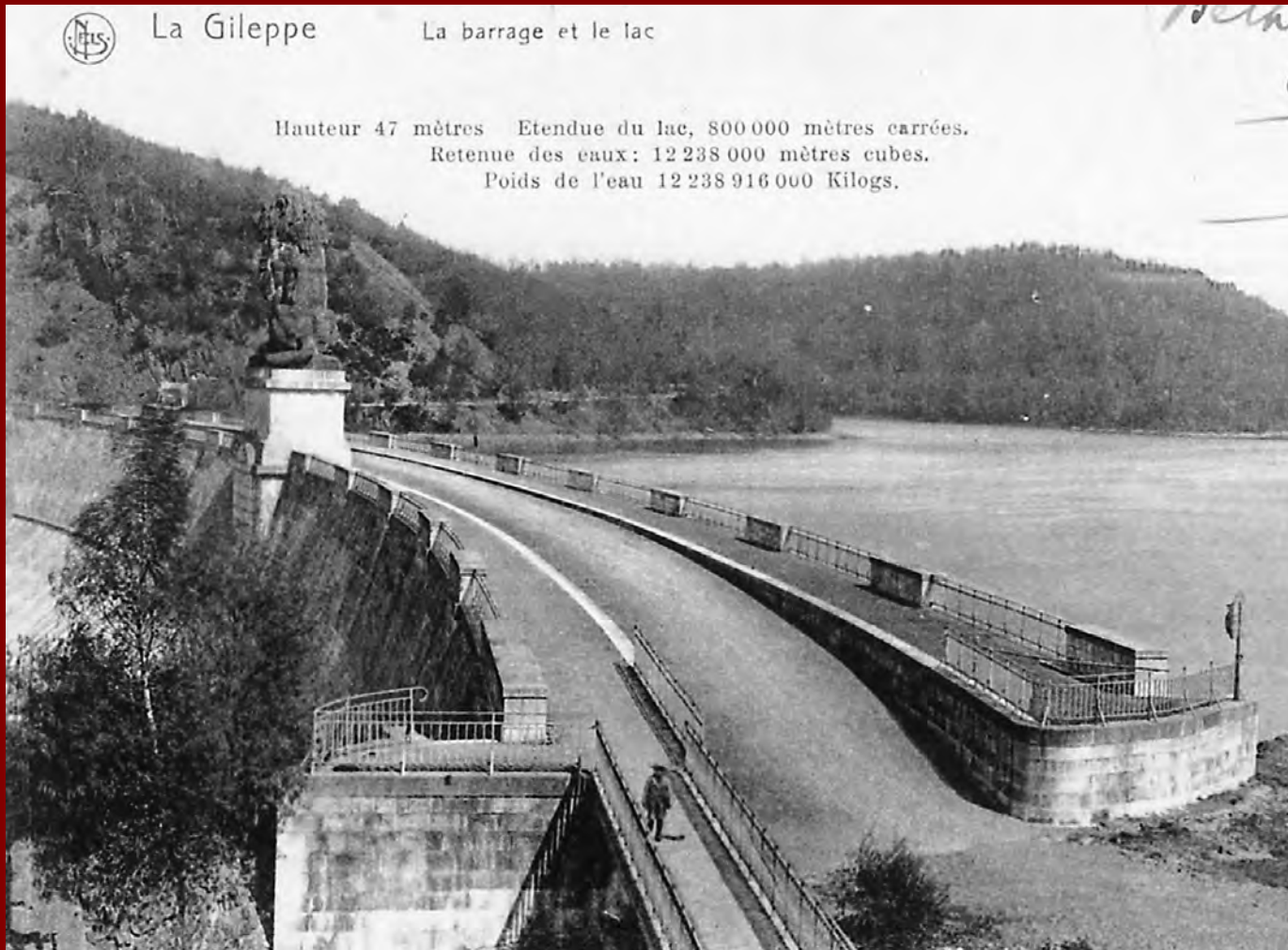
# Gravity Dams

## The Massive Tradition



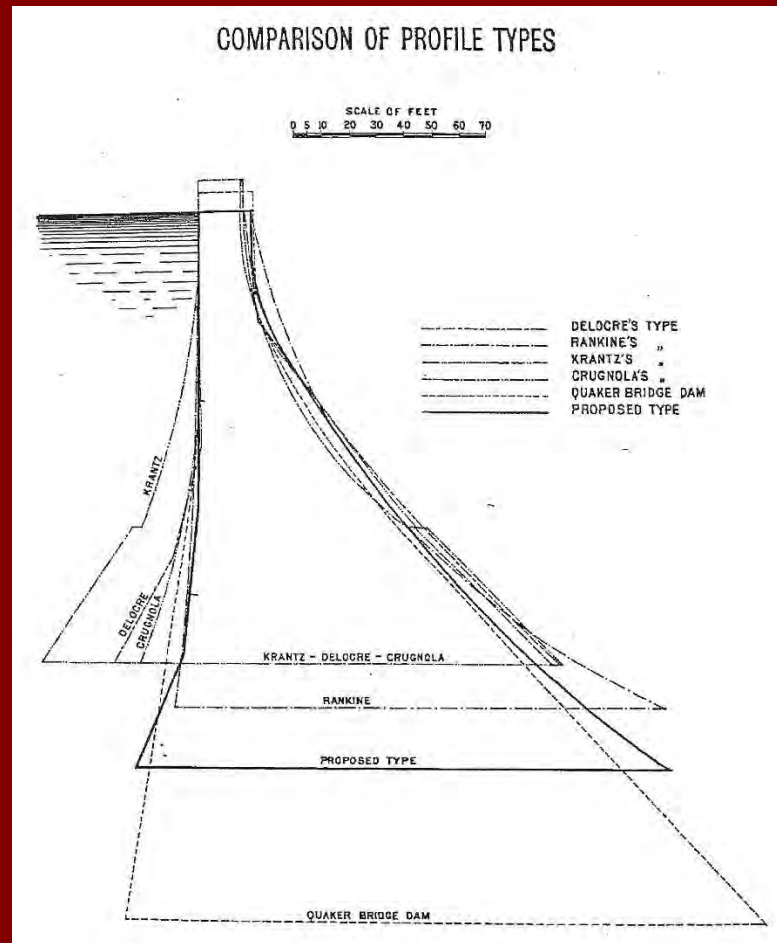


# Gilippe Dam – Belguim 1876



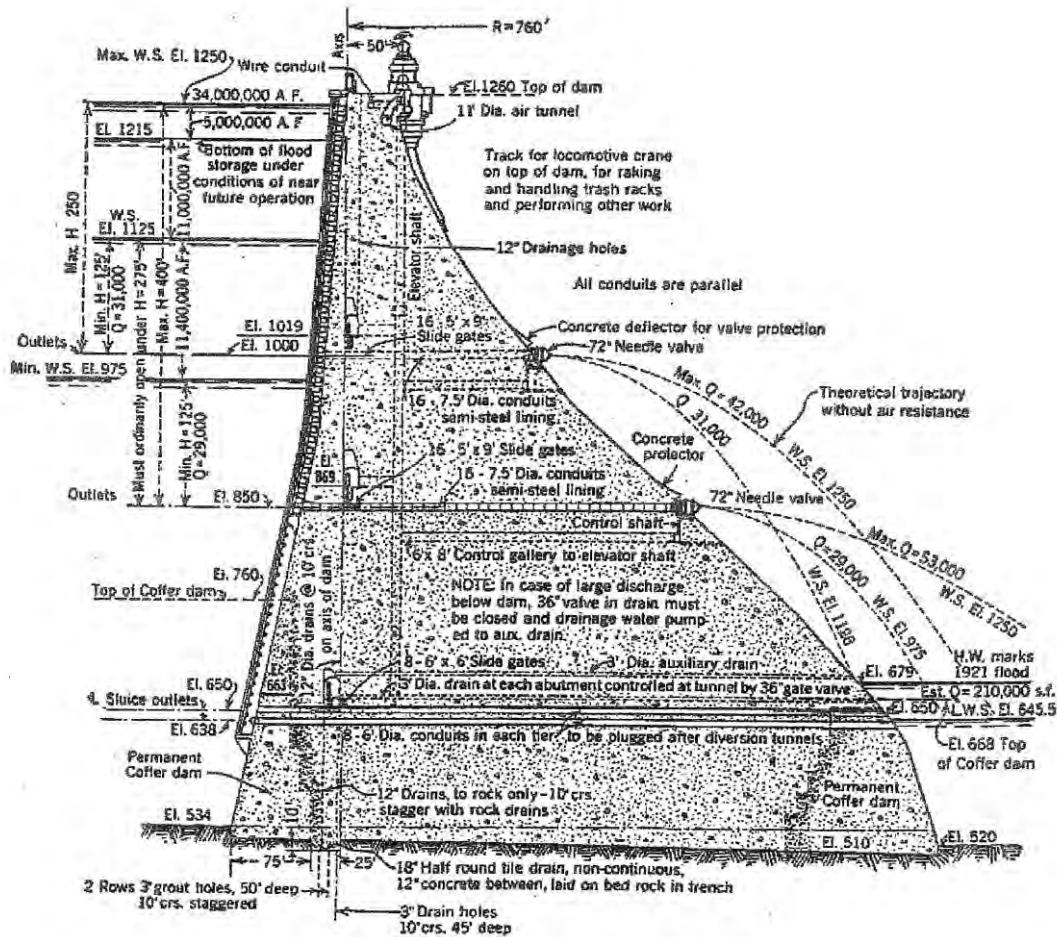
# The Massive Tradition

## Gravity Dam Profiles





# Boulder/Hoover Dam Design 1927



# Wachusett Dam 1905





# New Croton Dam 1907



# Elephant Butte 1916



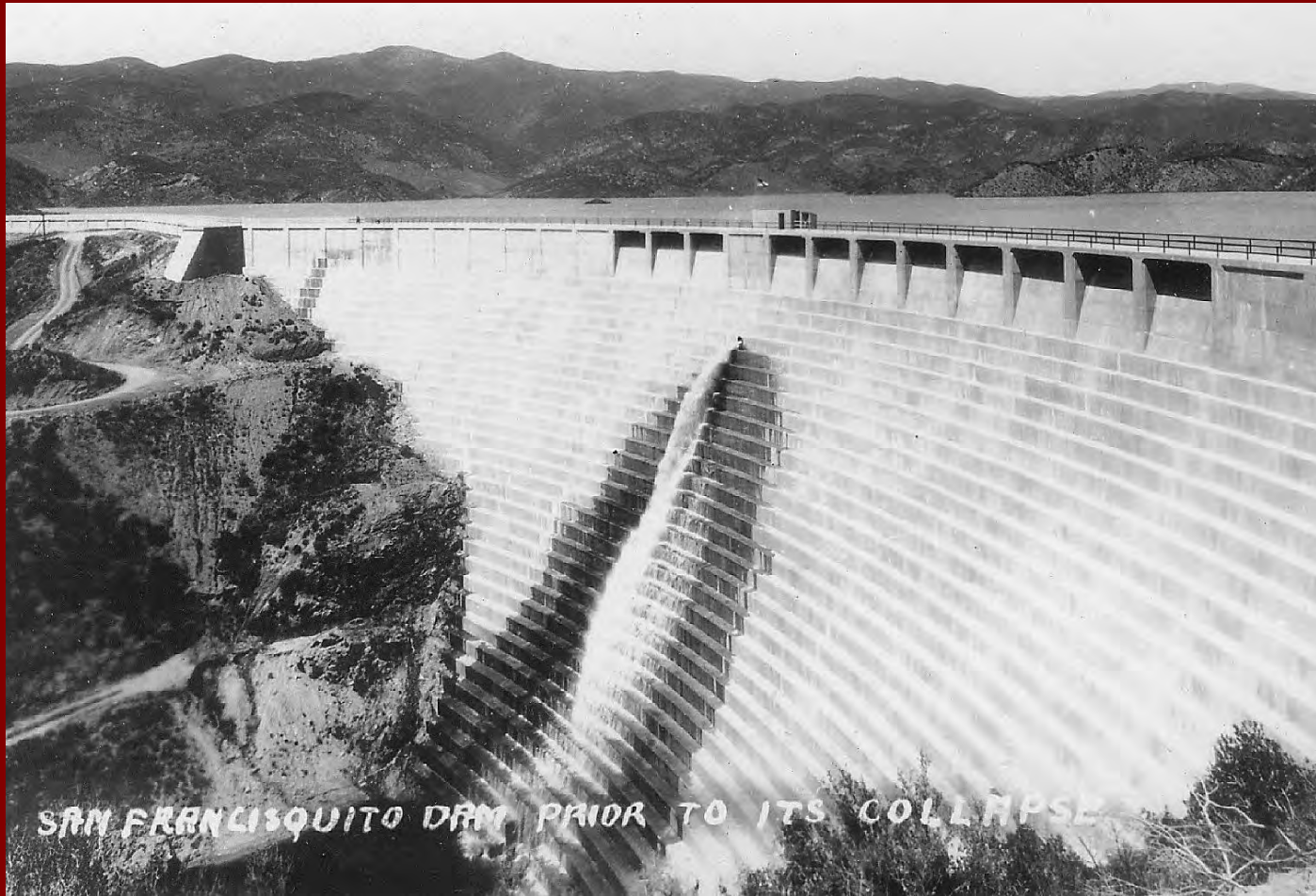


# O'Shaughnessy Dam 1923





# St. Francis Dam 1926



# St. Francis Reservoir

## 38,000 Acre Feet Capacity



# March 13, 1928





# St. Francis Dam Disaster

## The Deluge Unleashed...



# St. Francis Dam Disaster

## The Debris Field



# St. Francis Dam Disaster

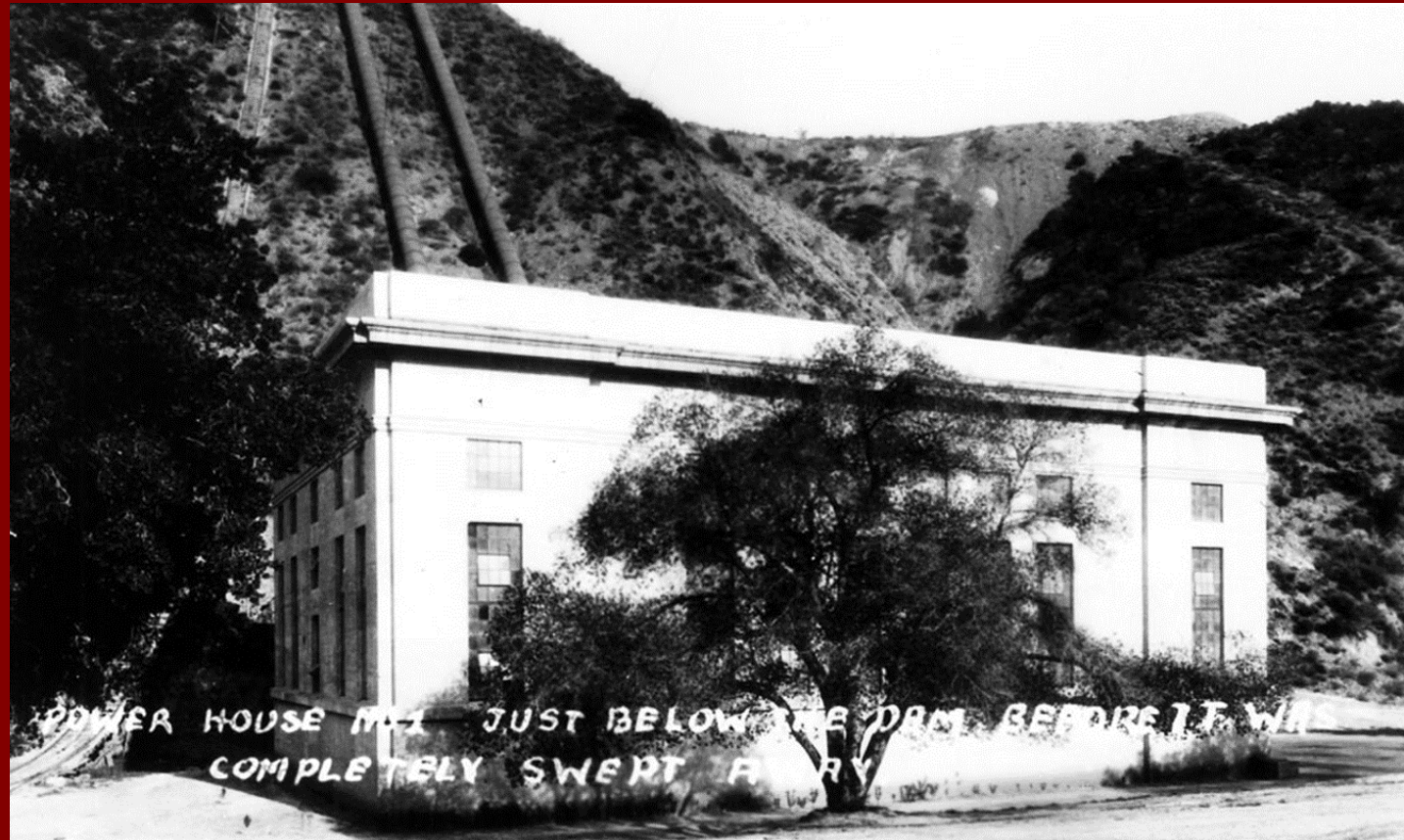
## 10,000 ton block of concrete





# St. Francis Dam Disaster

## San Francisquito Powerhouse No. 2



# St. Francis Dam Disaster

## San Francisquito Powerhouse No. 2





# St. Francis Dam Disaster

## San Francisquito Powerhouse No. 2



# St. Francis Dam Disaster

## Weinland Cottage – At SFPD No. 2



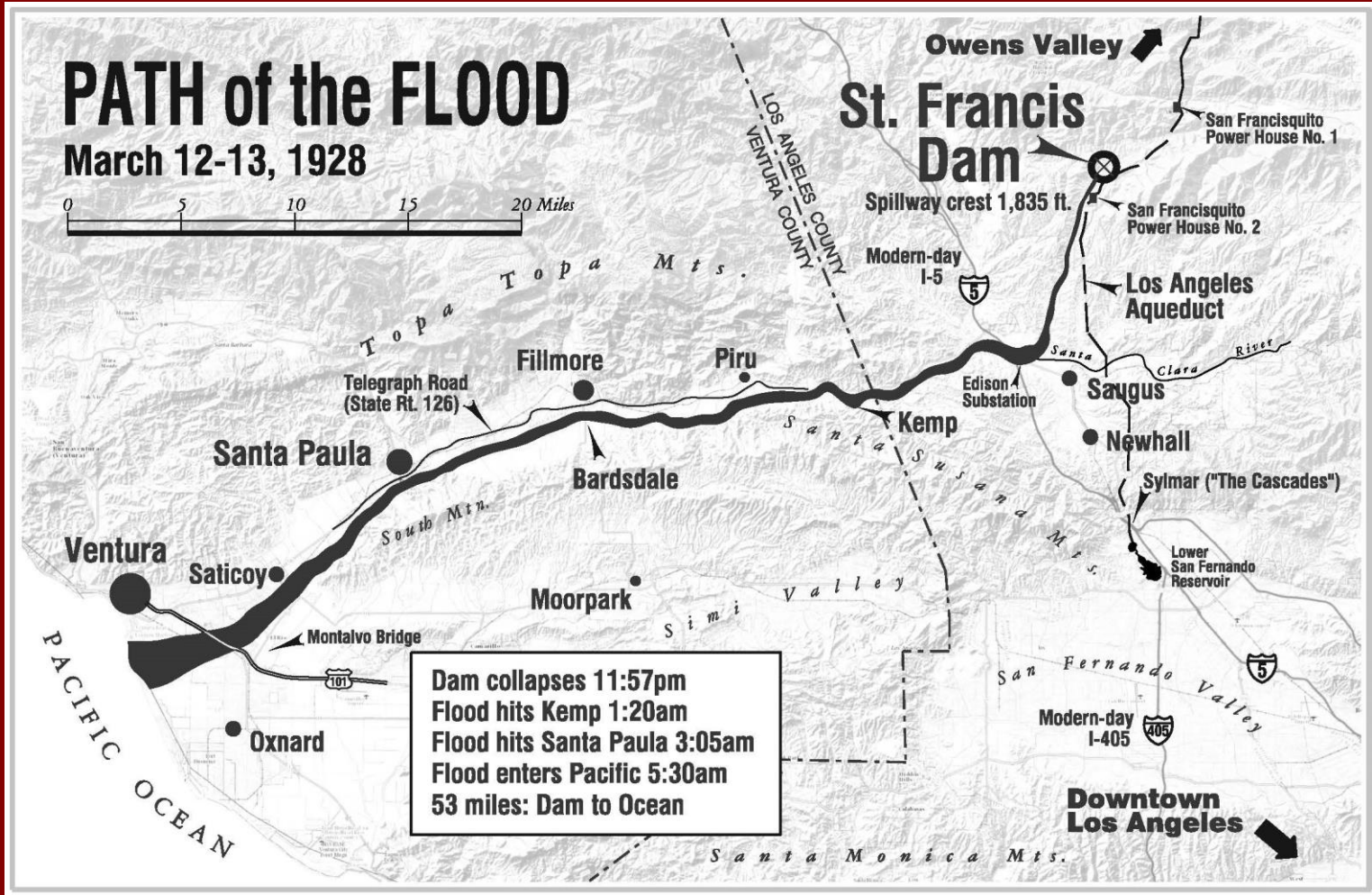
# St. Francis Dam Disaster

## The Power of Floods...





# St. Francis Dam Disaster



# St. Francis Dam Disaster

## Down the Santa Clara River Valley





# St. Francis Dam Disaster

**Wreckage at Kemp: 20 miles downstream**





# St. Francis Dam Disaster

## Kemp Camp - 83 Dead



# St. Francis Dam Disaster

## Destruction at Bardsdale



# St. Francis Dam Disaster

## Destruction at Santa Paula





# St. Francis Dam Disaster

## Montvalvo Bridge – 52 miles Downstream



# St. Francis Dam Disaster

## The Morning After...





# St. Francis Dam Disaster

## Looking for Bodies



# St. Francis Dam Disaster

## Crossing the Santa Clara River





# St. Francis Dam Disaster

## Transporting the Dead



# St. Francis Dam Disaster

## Santa Paula Morgue





# St. Francis Dam Disaster

## Newhall Morgue



# St. Francis Dam Disaster

## 400 Dead: A Community Grieves...





# St. Francis Dam Disaster

## Ruiz Family – Eight Dead



# Disaster Politics...

## THE SACRAMENTO BEE

SACRAMENTO, CAL., THURSDAY EVENING, MARCH 15, 1928—26 PAGES

Entered as second-class  
March 7, 1901, at Sacramento

BY EXCEPT  
SUNDAY

### Views Of The St. Francis Dam Disaster

### BOULDER DAM FAVORABLY REPORTED TO CONGRESS

Recommendation Breaks Six  
Week's Silence On Swing-  
Johnson Measure

#### ARIZONA STAND IS RAFFED IN REPORT

Failure Of Seven-State Rati-  
fication Of Plan Is Laid  
To That State

WASHINGTON, March 15.  
(AP) The six weeks of  
silence on the new Swing  
Johnson Boulder Canyon dam  
measure was broken in the  
house to-day when its irriga-  
tion committee reported the  
bill with a favorable recom-  
mendation.

CONSTRUCT HUGE DAM.  
The bill would authorize the co-

### DEMOCRATS WILL GIVE CALIFORNIA HISTORIC BAT

Efforts Of Two Facio  
"Get" Al Smith Br  
On Unusual Conte

#### WALSH JUST THRO TO FEED McADOO GR

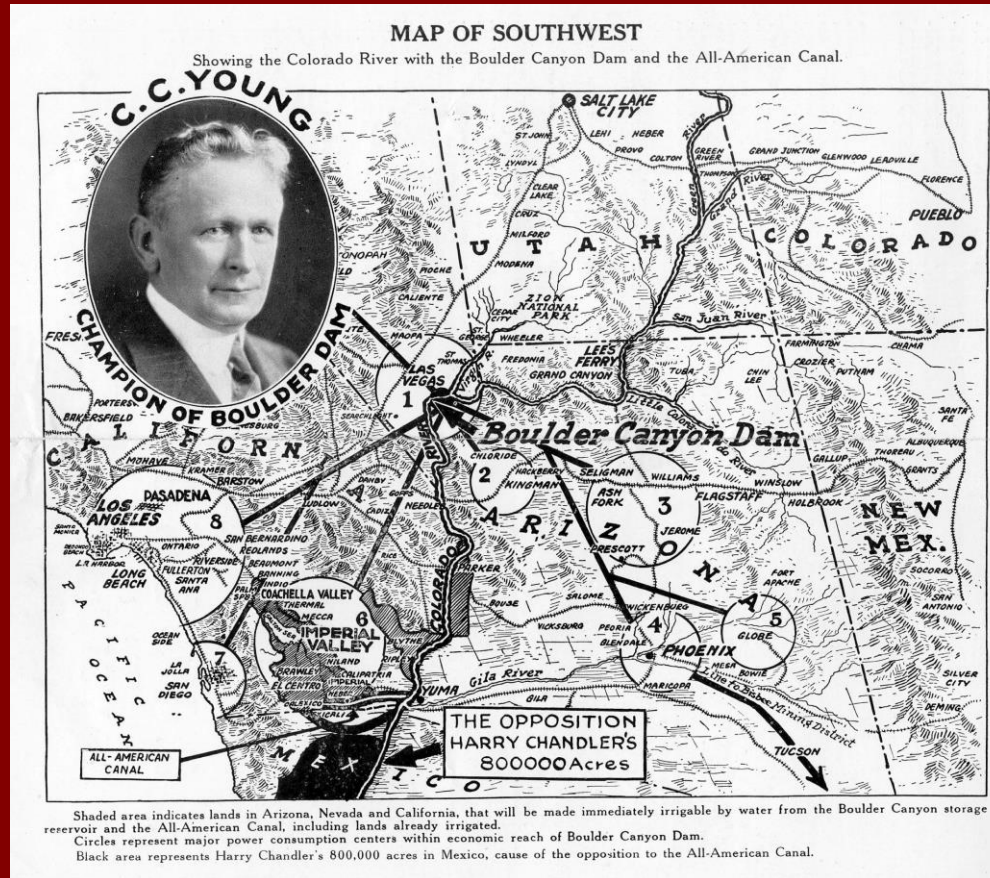
#### Southerner Hopes To Party. Winning W Either Walsh, Re

By WALTER F. JONES  
California will witness  
next six weeks one of the  
most interesting and animated of  
primary election contests in  
the history of the state.  
All the battline will be  
set at the nomination of  
Governor Al Smith. He  
has three tickets of batti-  
nation delegates on the  
table. There will be only four  
tickets on the Republican ticket.  
One faction of the  
Republican party is  
sponsoring a ticket of  
pledged to Governor Al  
New York. It is led by  
United States Senator  
Phelan of San Francisco.  
Another element of the  
Republican party is  
put in the field a ticket  
the nomination of United  
States Senator James A. Reed of  
Ill. is headed by Milton K.  
Los Angeles attorney.  
McAdoo seeks Smith's  
then there are the

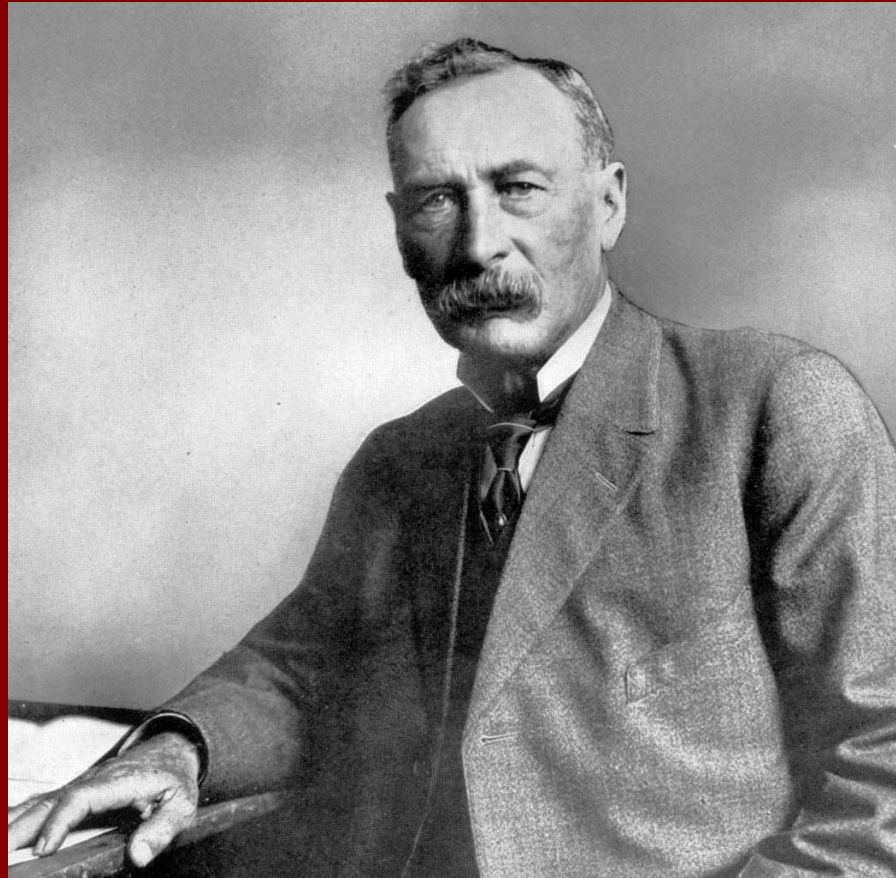


# Governor C. C. Young

## “Champion of Boulder Dam”



# Mulholland and the Boulder Canyon Project





# Mulholland Above Black Canyon on the Colorado River - 1925



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# **Mulholland & Boulder Canyon Project**

**Mulholland promotes BCPA**

**Testifies before Congress 1924**

**Trips to/down Colorado River 1921, 23, 25**

**Promotes creation of the**

**Metropolitan Water District 1925→**

**Colorado River Aqueduct surveys 1925→**

**Comes to Washington DC to lobby for**

**Boulder Canyon Project Act Jan. 1928**

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# Why Dam History?

**Perhaps you're wondering...**

**How did I become a  
“Dam Historian”?**

**Well, it's a long story...**

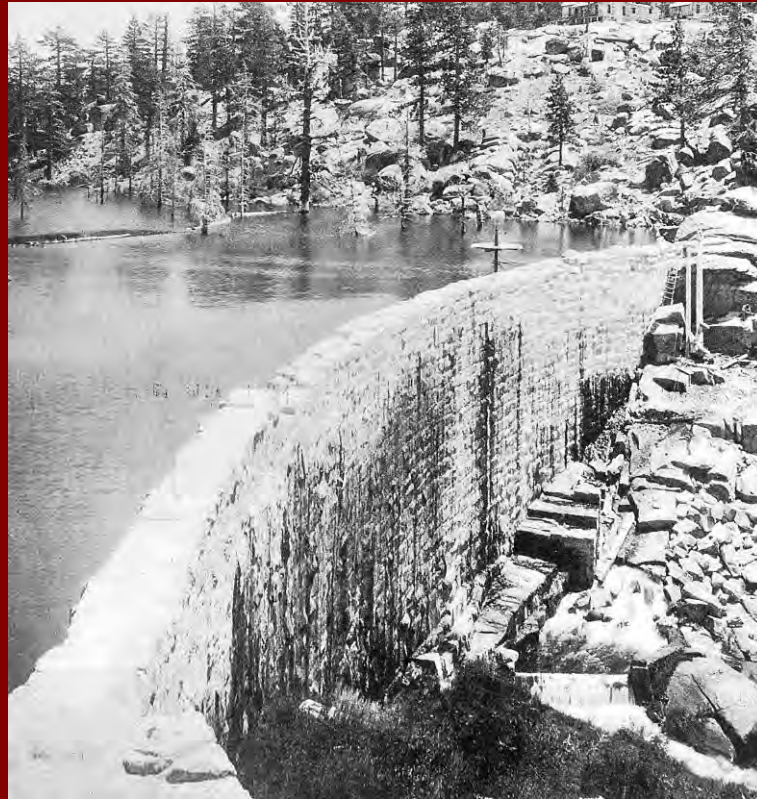
# Is There Another Way?





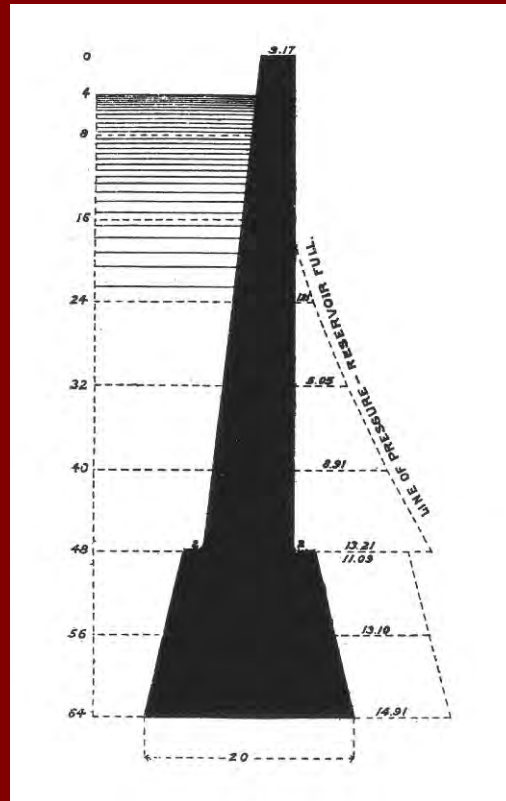
# The Structural Tradition

## Thin Arch Dams Bear Valley Dam 1884



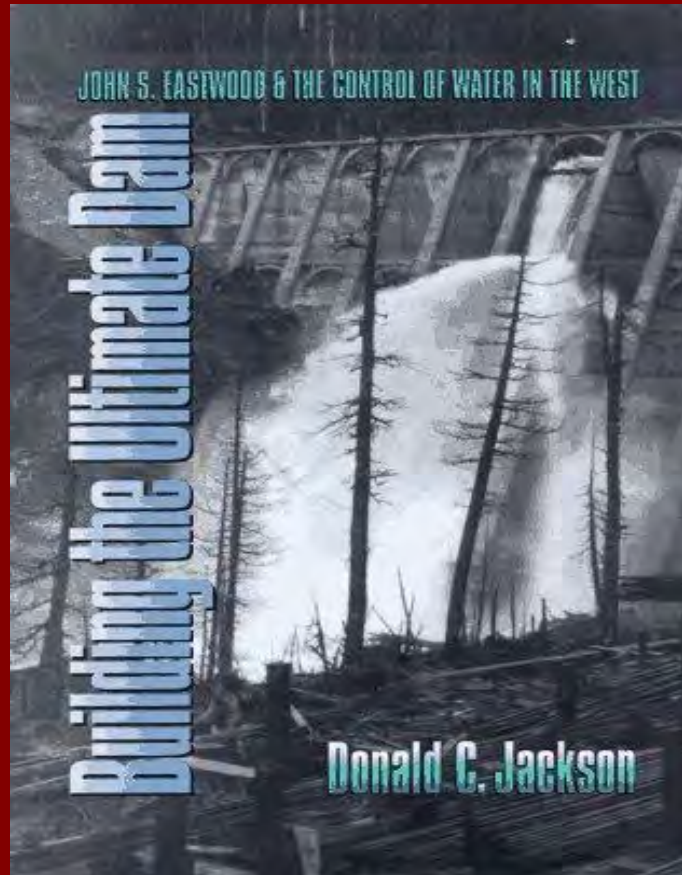
# Thin Arch Profile

## Bear Valley Dam



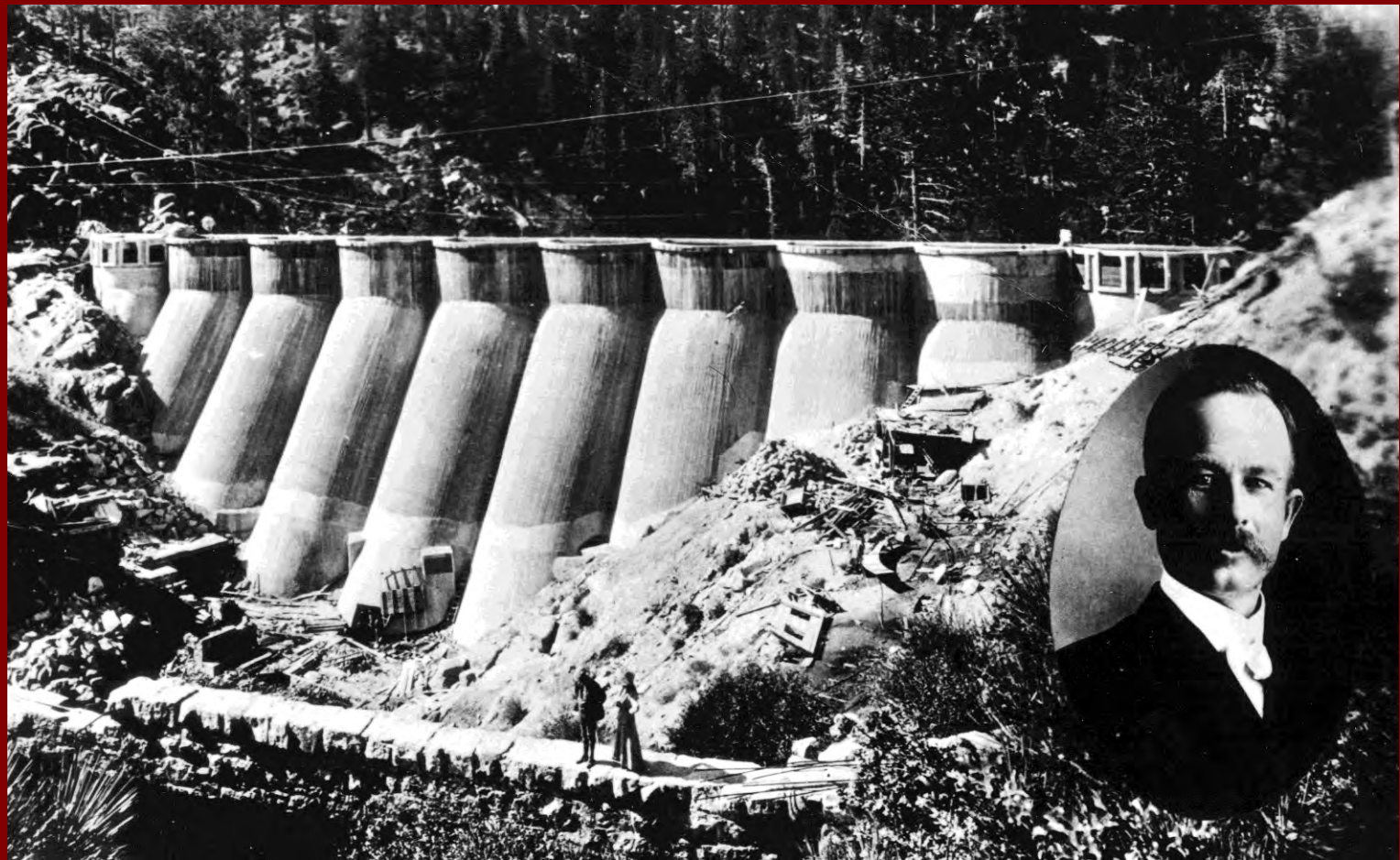


# Structural Innovation & “The Ultimate Dam”



# The Multiple Arch Dam

John S. Eastwood & Big Bear Dam (1911)





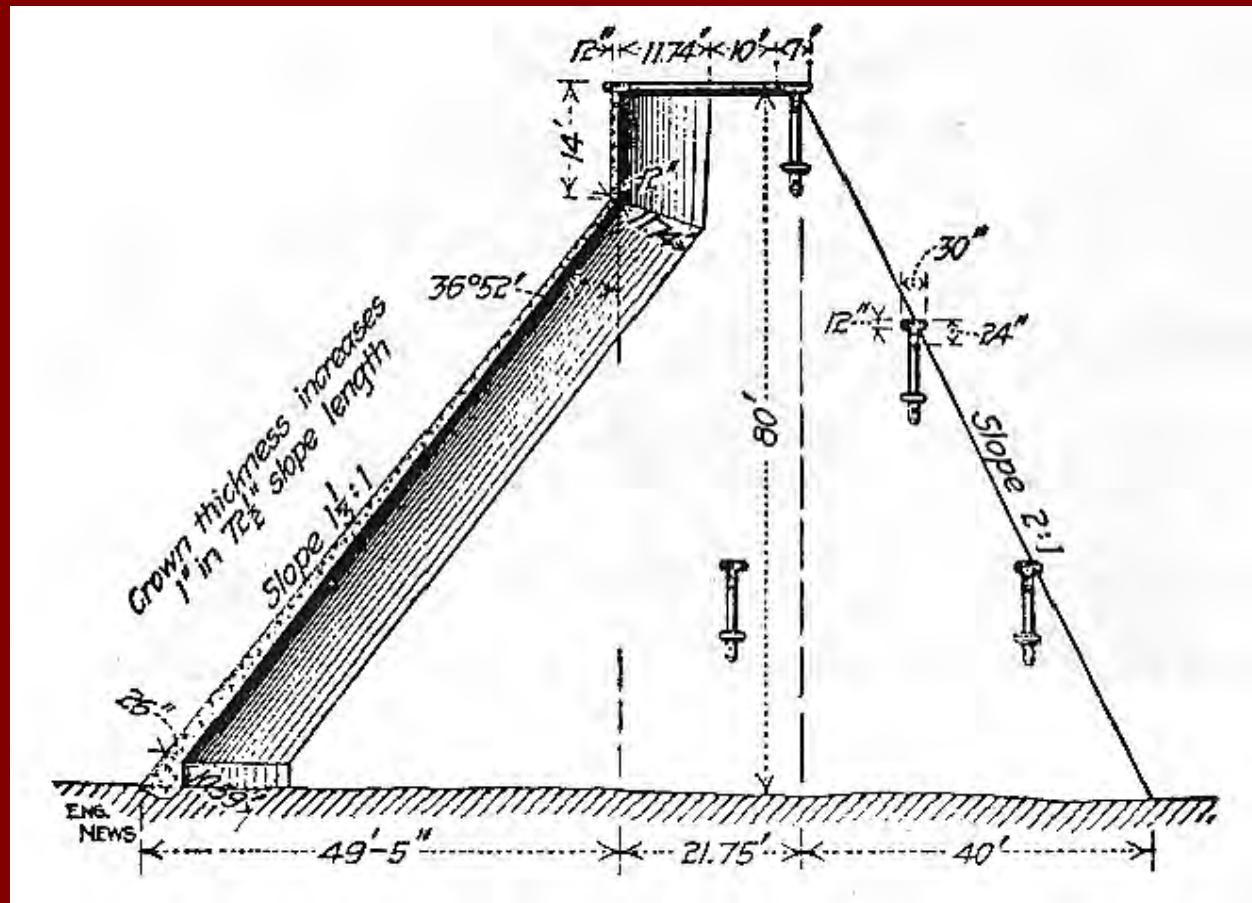
# Multiple Arch Dams





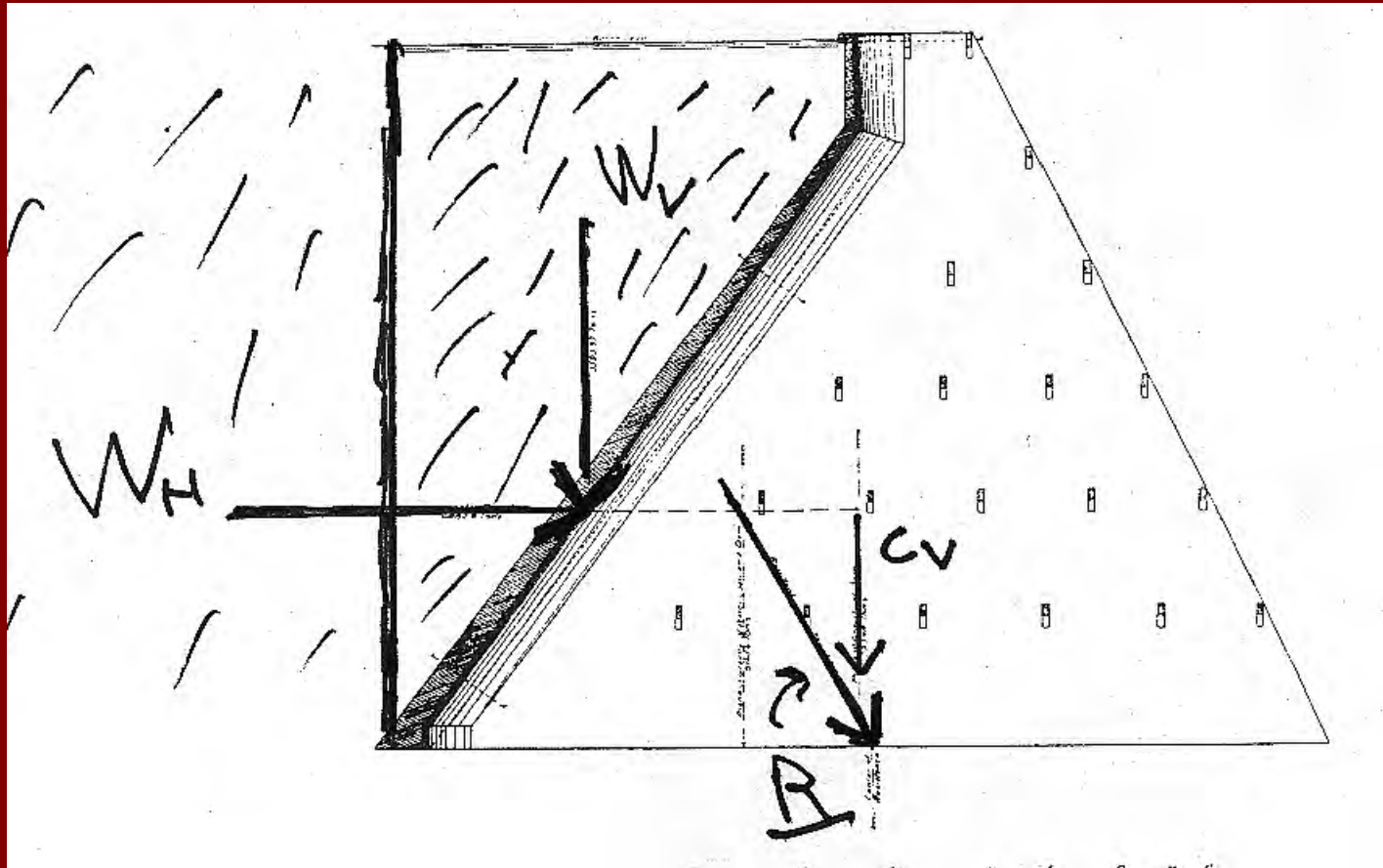
# Multiple Arch Dams

## Big Bear Dam Profile



# Multiple Arch Dams

# Buttress Dam Profile



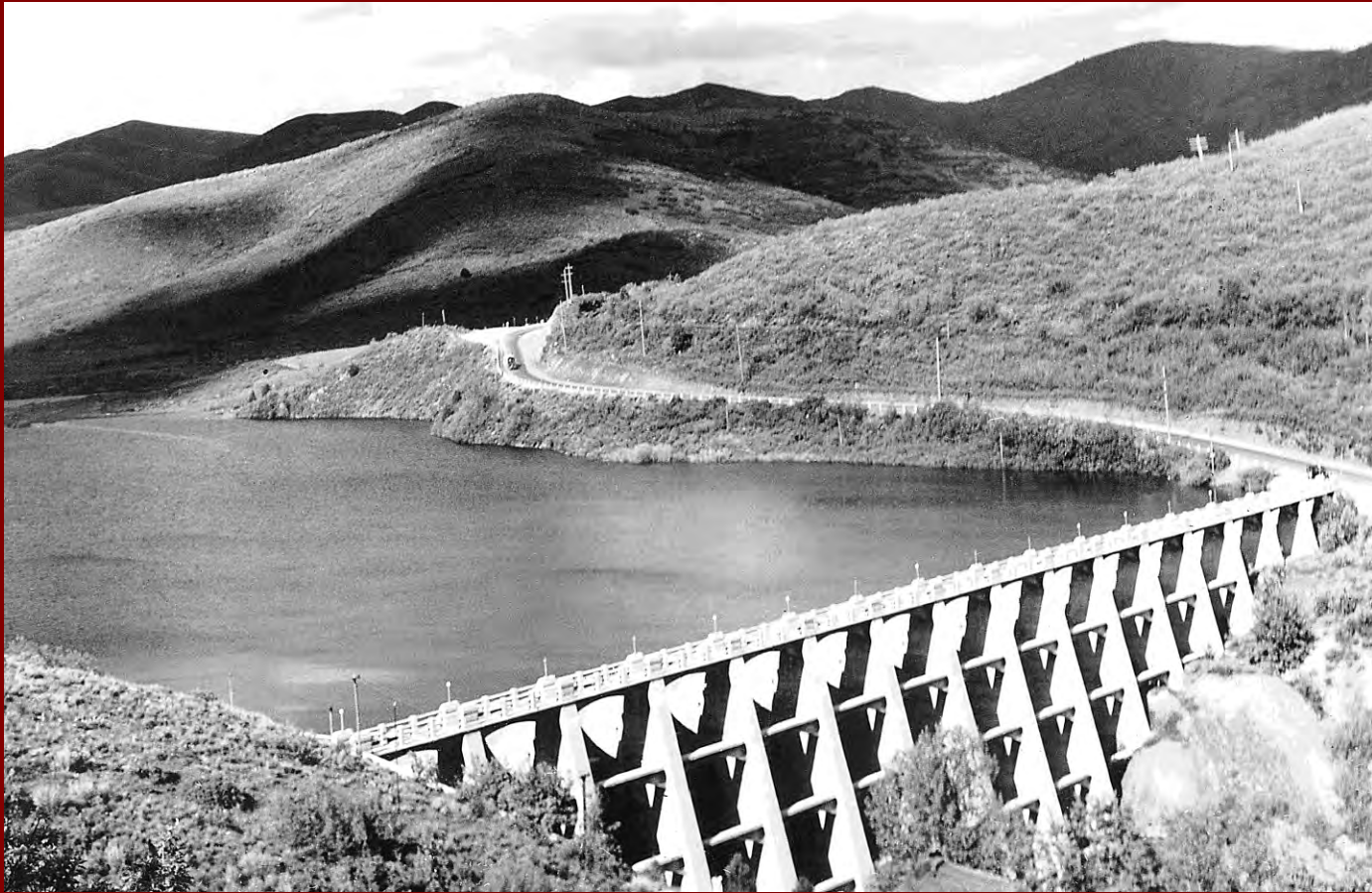
# Multiple Arch Dams





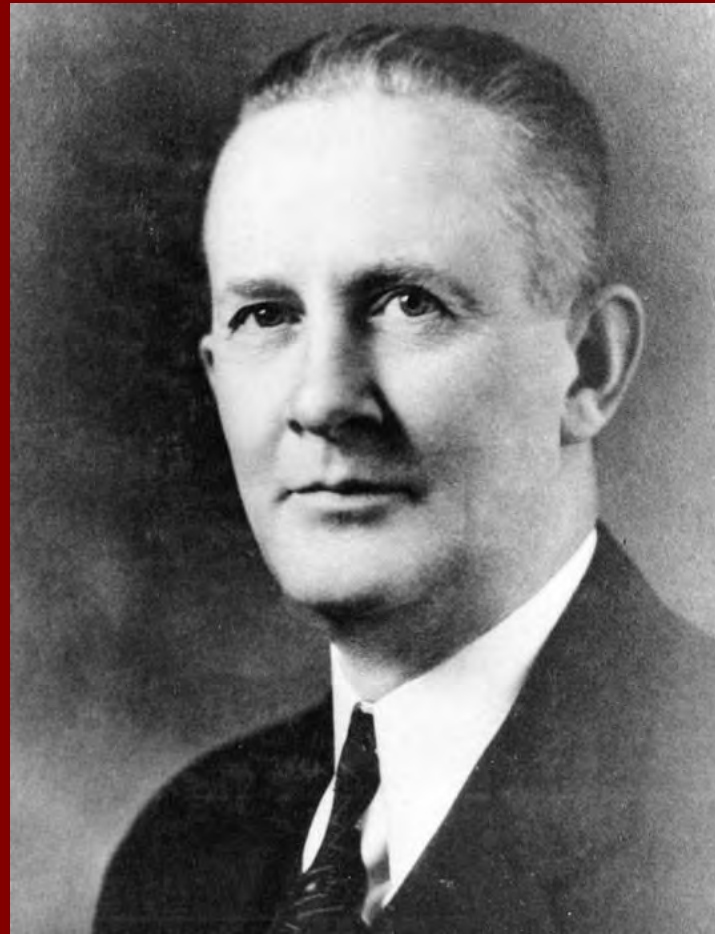
# Multiple Arch Dams

**Salt Lake City's Mt. Dell Dam 1917, 1925**



# **Sylvester Q. Cannon**

## **City Engineer, Salt Lake City**



# Multiple Arch Dams

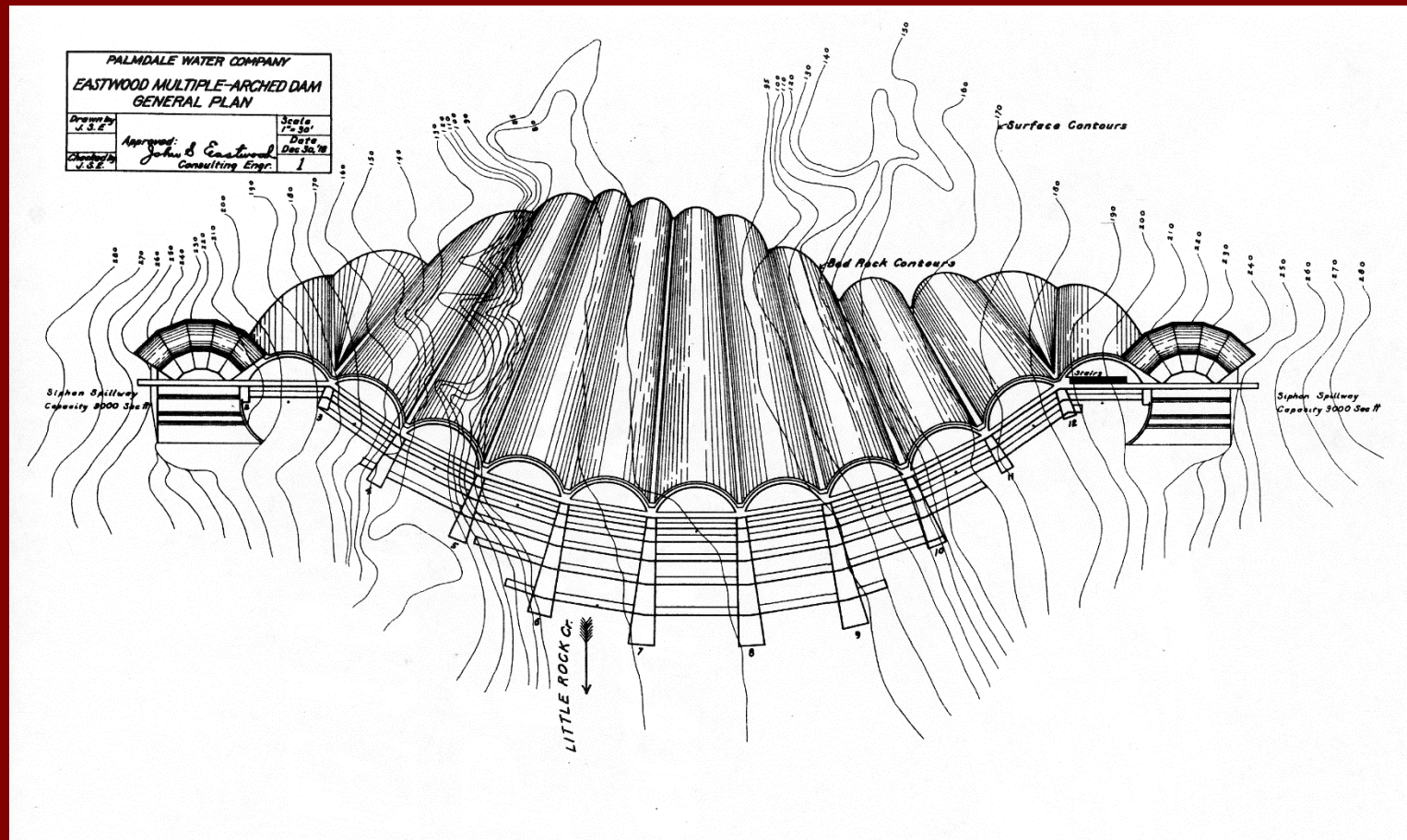
## Littlerock Dam 1924





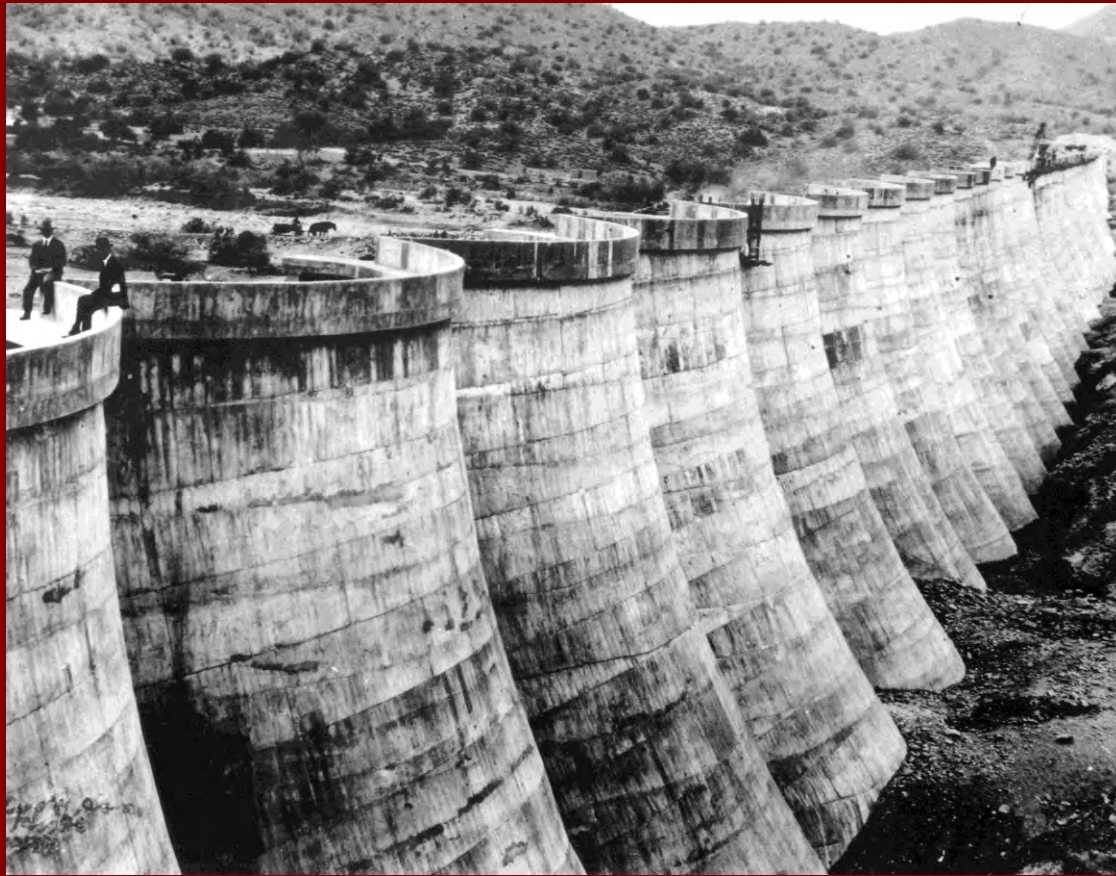
# Multiple Arch Dams

## Radial Plan Design Littlerock Dam 1918



# Multiple Arch Dams

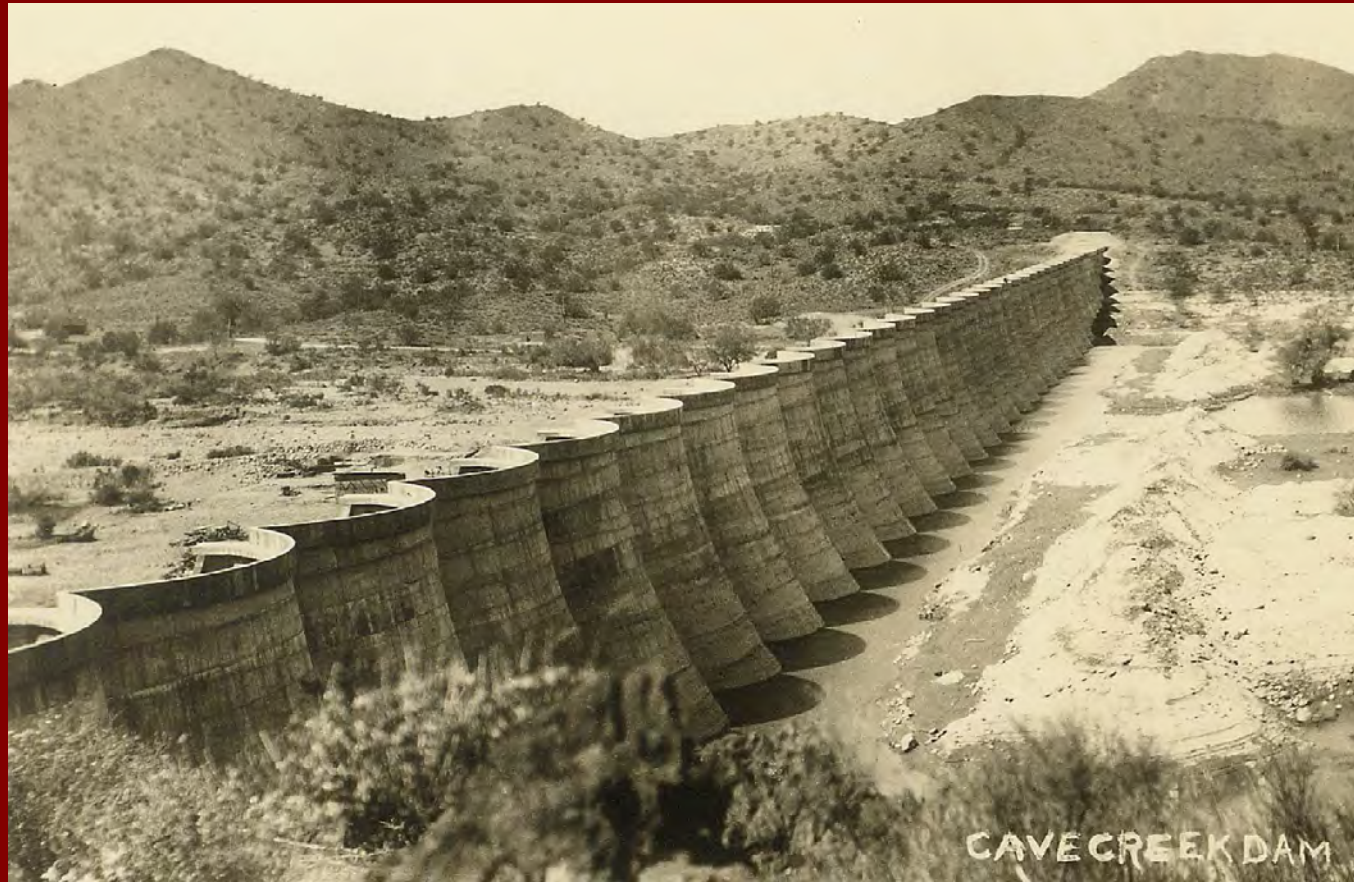
## Curved Face Design - Cave Creek Dam (1923)





# Multiple Arch Dams

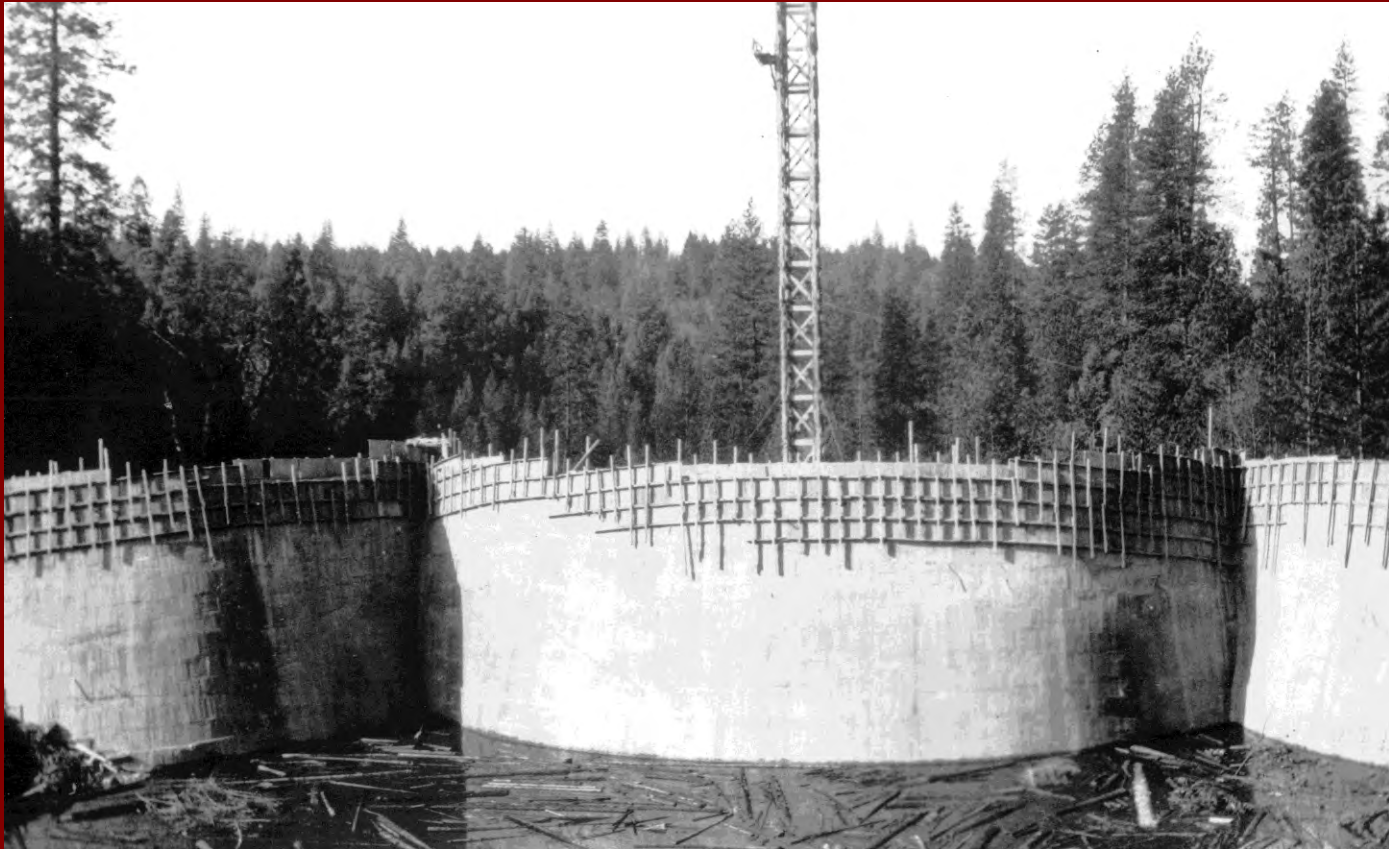
## Cave Creek Dam





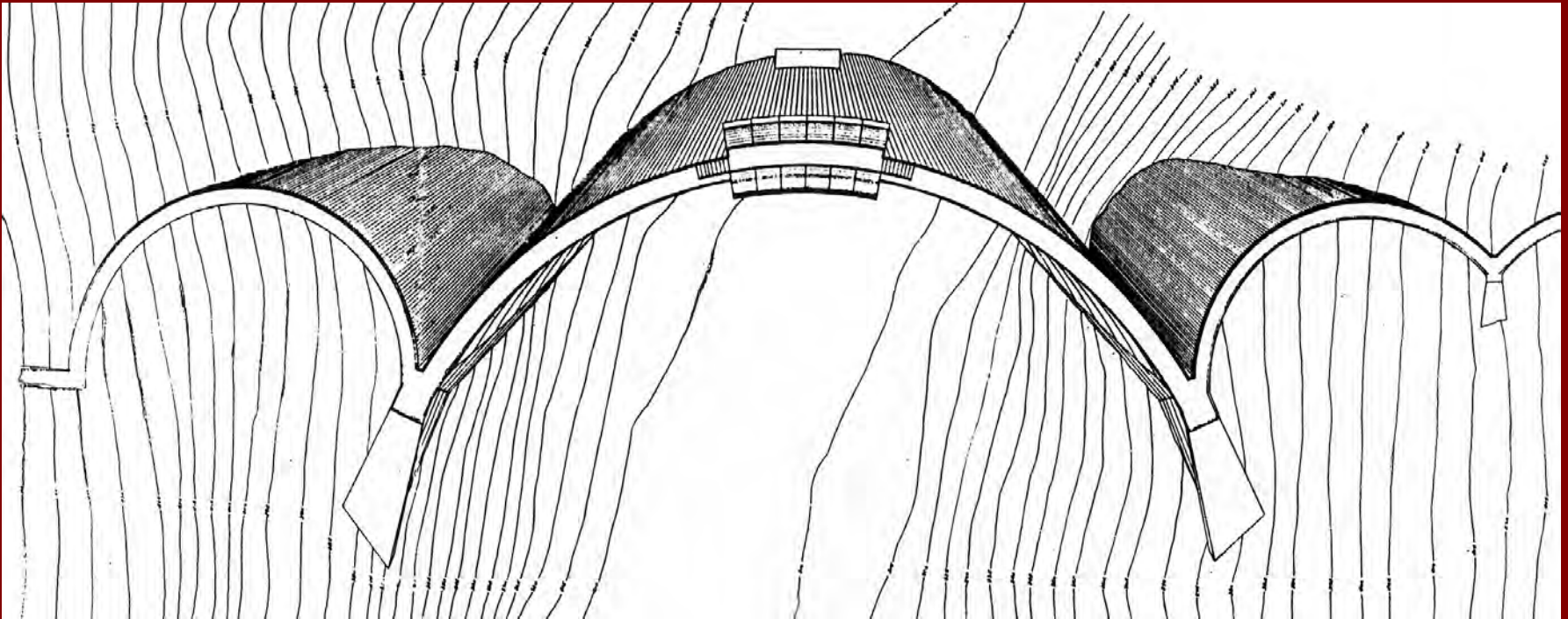
# Multiple Arch Dams

## Webber Creek Dam 1924



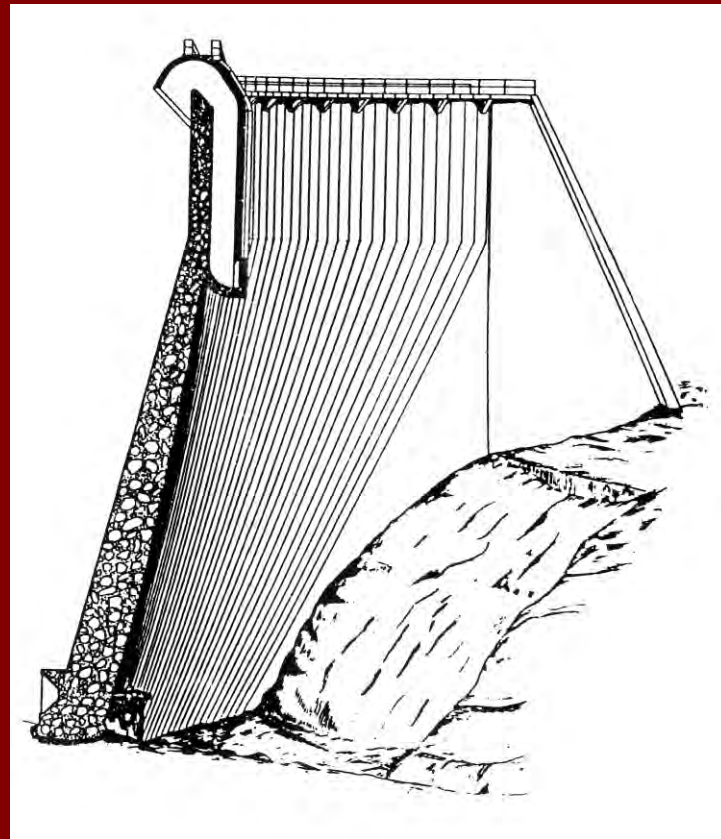
# Multiple Arch Dams

## San Elijo Dam Proposal 1923



# Multiple Arch Dams

## San Elijo Dam Profile





# Multiple Arch Dams

**John S. Eastwood dies August 1924**

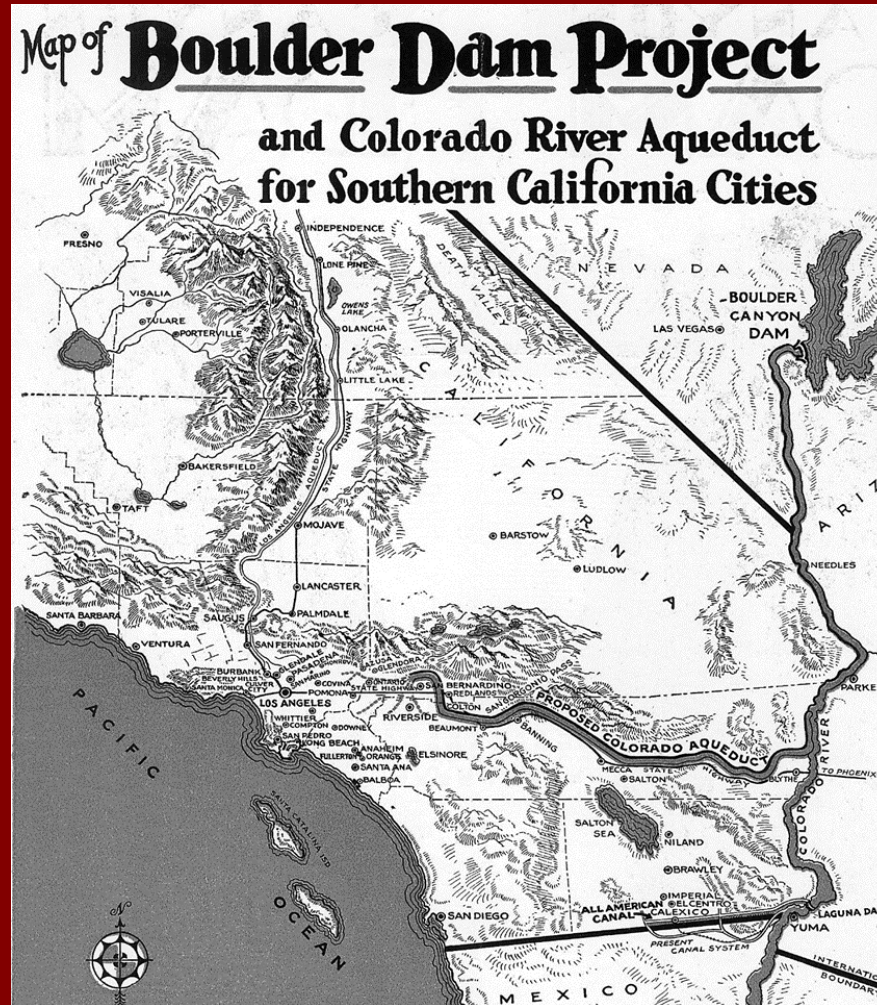


# Mulholland and the Los Angeles Aqueduct 1907-1913





# Los Angeles Aqueduct 1907-1913



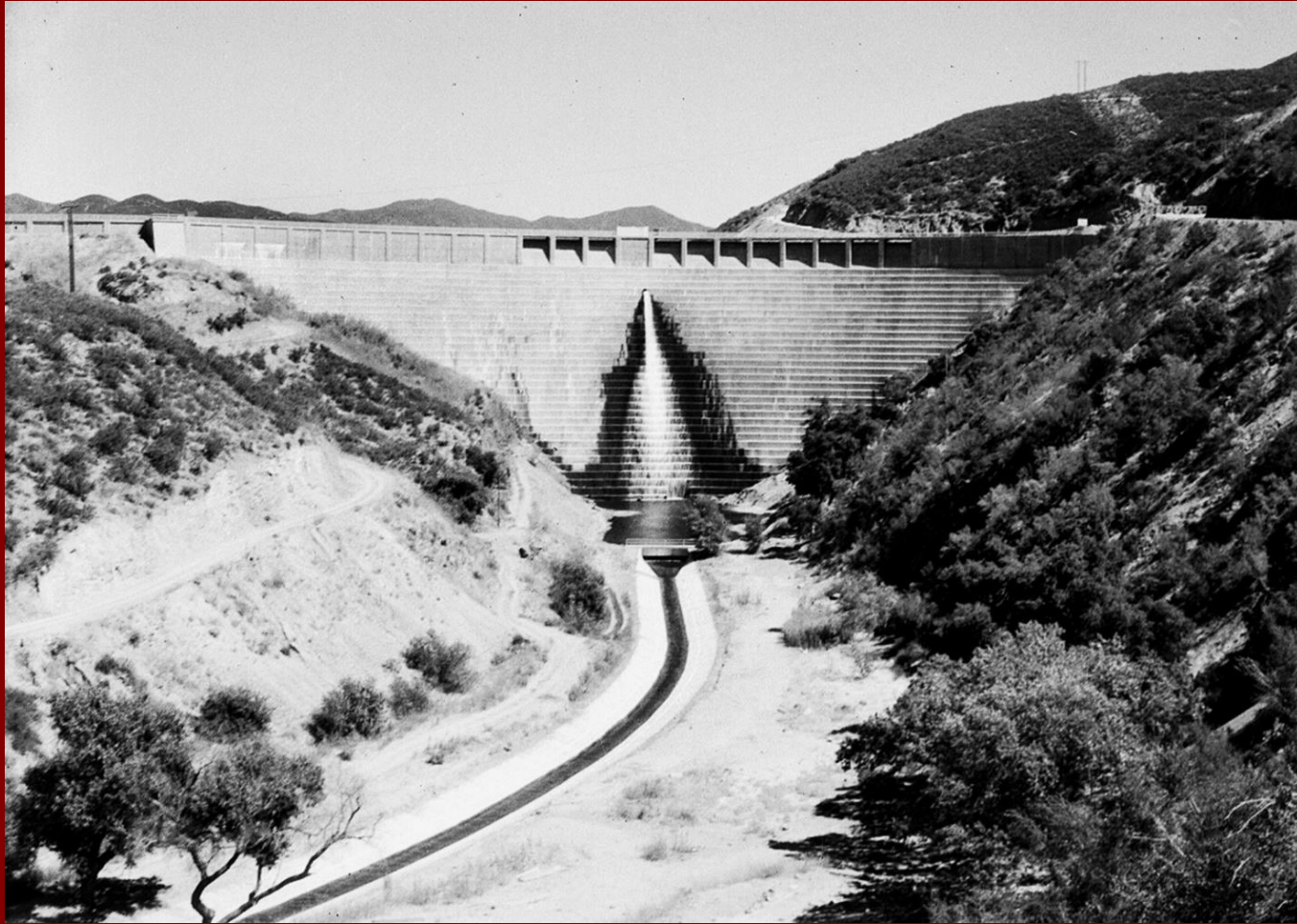


# William Mulholland & Los Angeles

## Los Angeles Aqueduct – November 1913



# St. Francis Dam & LA Aqueduct



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# California State Dam Regulation

## California Dam Politics

**1917 Dam Safety Law required non-federal  
dams more than 10 feet high to be  
approved by the State Engineer**

**Unless built by a corporation under the  
jurisdiction of the State RR Commission**

**Or, unless built by a Municipality with a  
Department of Engineering:**

**THE MUNICIPAL EXEMPTION**

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# California State Dam Regulation

## CITY AND COUNTY OF SAN FRANCISCO

### DEPARTMENT OF PUBLIC WORKS

BUREAU OF ENGINEERING

ADDRESS ALL COMMUNICATIONS TO THE  
CITY ENGINEER

IN YOUR REPLY, REFER TO FILE

October 3, 1928.

Mr. Edward Hyatt,  
State Engineer,  
Sacramento, California.

Subject: Supervision of Dams.

Dear Mr. Hyatt:

I have your letter of September 6th with replies to a questionnaire in reference to proposed legislation at Sacramento to control by supervision the design and construction of dams, assuming that somebody selected by the State should be clothed with requisite authority to control those structures.

For the past forty years I have been engaged in the construction of dams, not only in this State but in New Mexico, State of Washington, and in the State of Kentucky, in all of which I have built different kinds of dams of various designs on different classes of foundations. I have completed perhaps over twenty dams, all of which have stood the effect of time and floods. So that I may fairly claim experience as a successful dam builder.

After every disaster to a dam there is great hysteria amongst the newspapers and the public to vest authority in somebody who can guarantee the safety of all future structures. The problem is to find that somebody who has gathered wisdom from his experience and with adequate technical knowledge, who can fill the job.

I had our City Attorney present objections to the State legislative body in Sacramento in 1917, against allowing Mr. McClure to have anything to do with our dams at Hetch Hetchy, as I did not think, from his previous experience and knowledge, he had the requisite experience to pass on such a subject and I did not care to be subject to his capricious rulings. In 1916, when before building the railroad to Hetch Hetchy, he endeavored to interrupt the progress of our work by compelling the taxpayers of San Francisco to build a lot of overhead concrete bridges over our spur railway track, which we built for hauling freight, I presented opposition to his proposal before the State Railroad Commission and was sustained by them, and the railroad has been built and operated, carrying all the cement for our project, without having one single accident at our railway crossings. I did not think that Mr. McClure's previous clerical and engineering experience entitled him to be czar over the plans for our dams.

# California State Dam Regulation

## O'Shaughnessy's Objections to State Reg

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# Eastwood's Littlerock Dam Required 4 Years to Win State Approval





# St. Francis: Design & Construction



# St. Francis: Design & Construction

## St. Francis Dam Site 1923

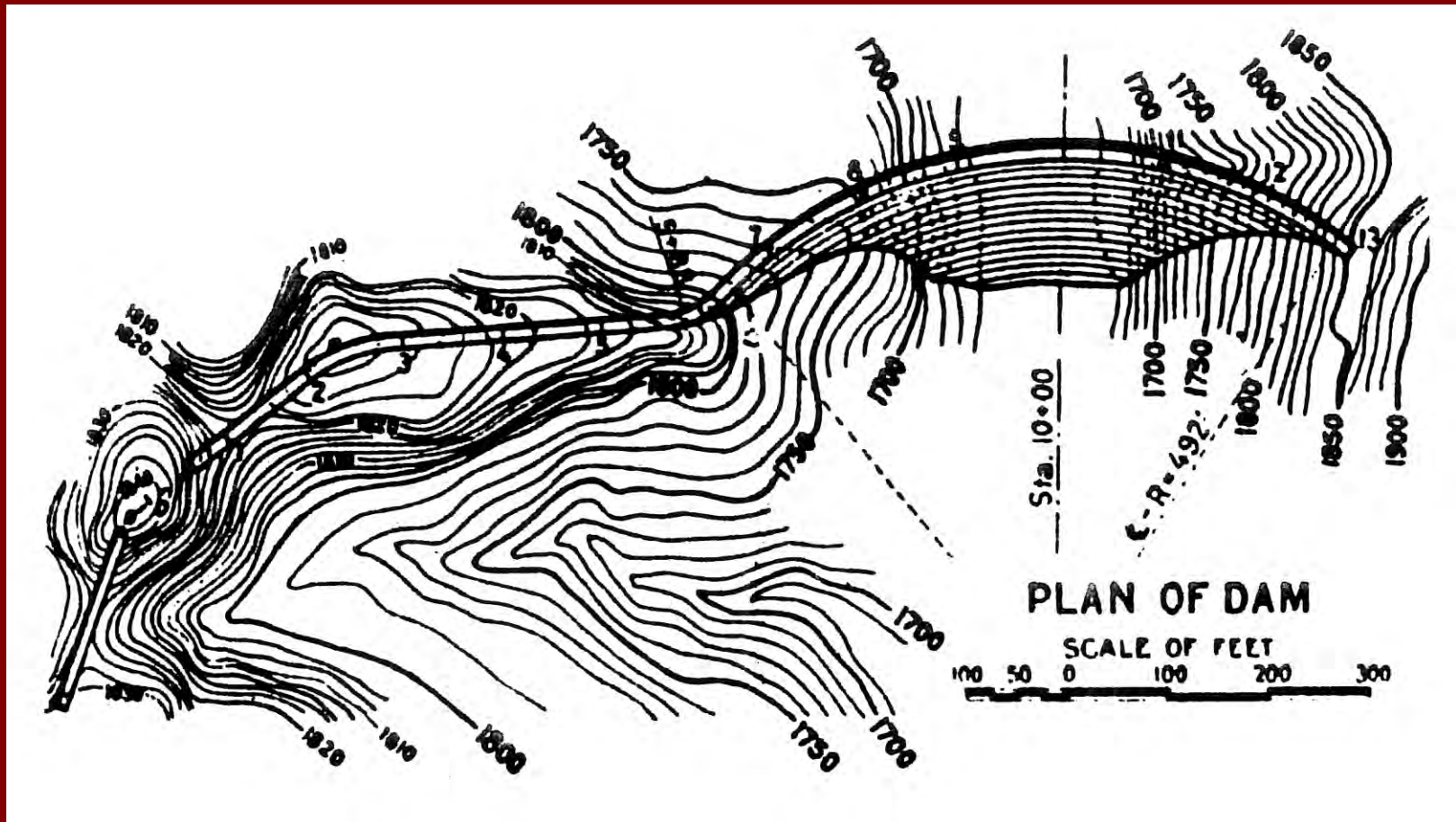


SAN FRANCISQUITO CANYON, SHOWING PROPOSED DAM SITE AND PORTION OF RESERVOIR.  
("A" SHOWS APPROXIMATE LOCATION OF DAM.)



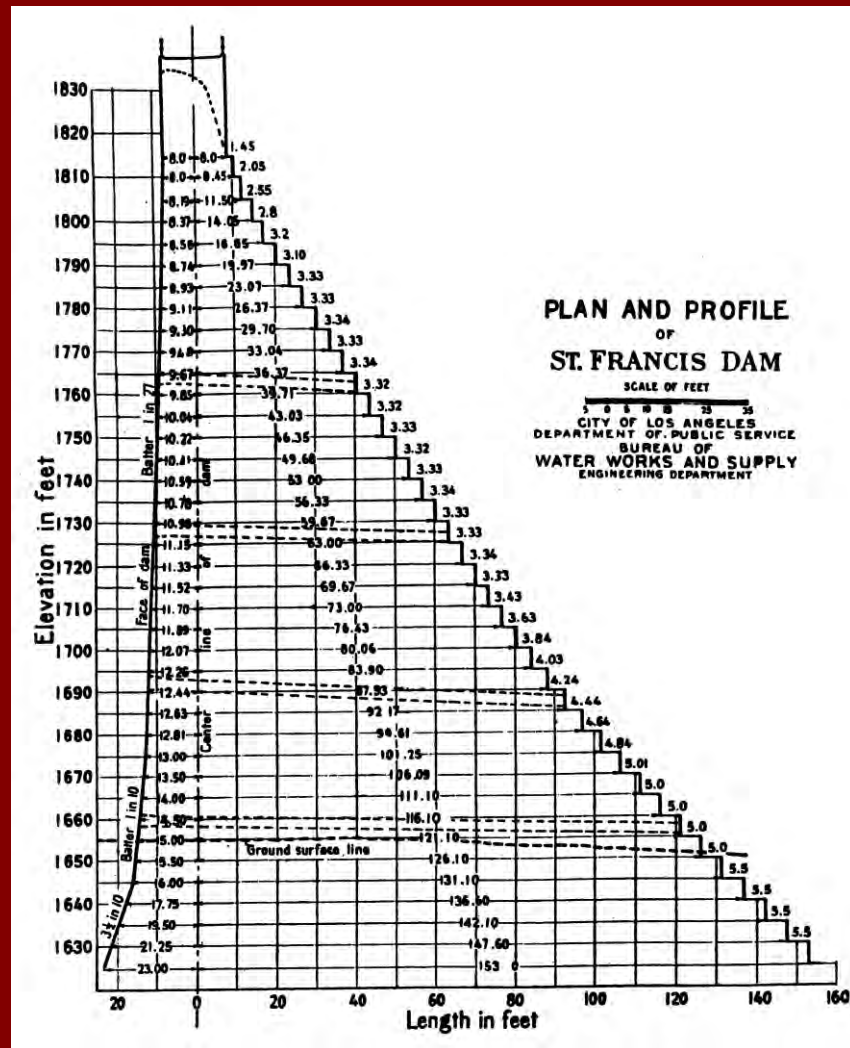
# St. Francis: Design & Construction

## Plan View of the St Francis Dam





# St. Francis: Design & Construction



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# St. Francis: Design & Construction

## **“changes in the plans”**

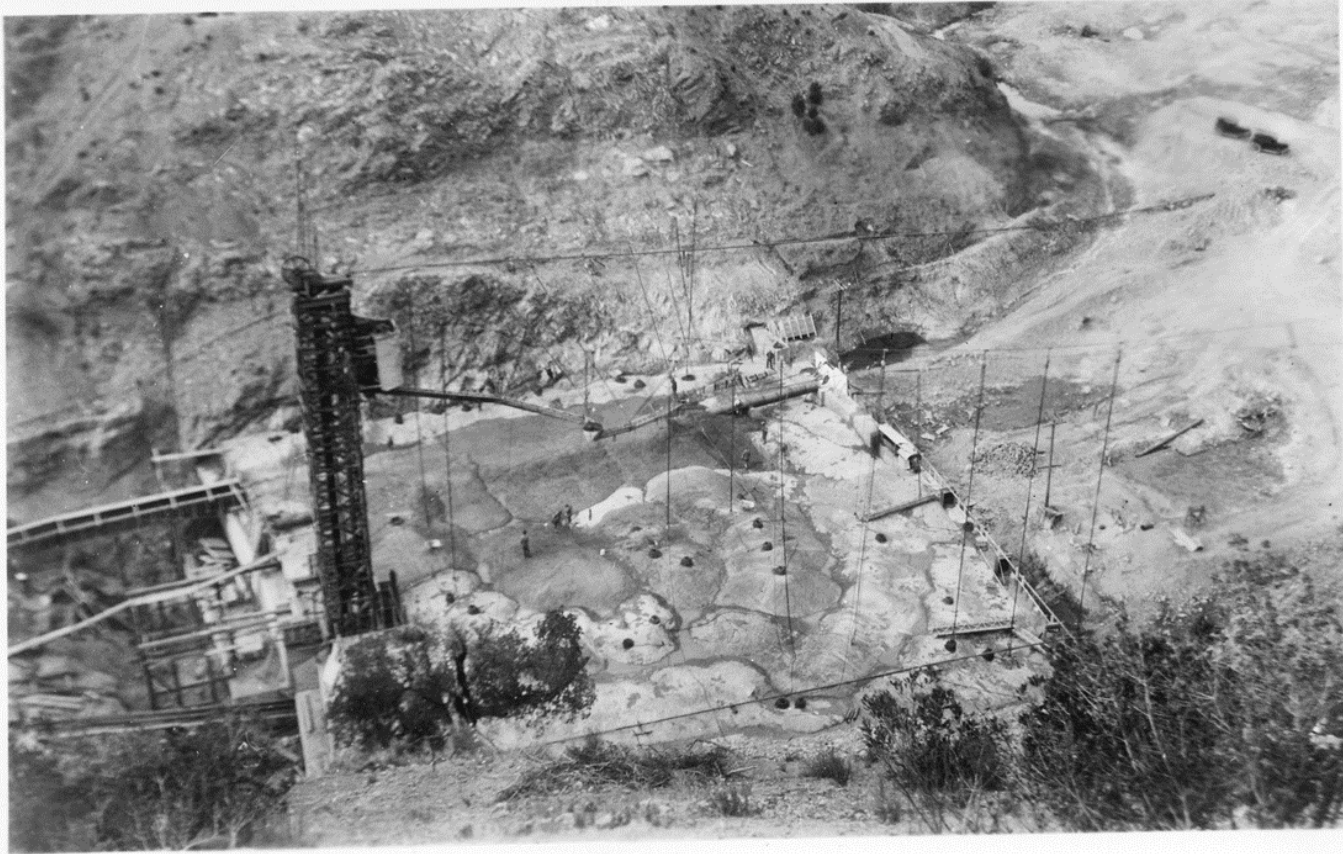
**St. Francis Dam spillway crest  
raised from elevation 1825 feet to 1835 feet  
after construction had begun**

**NO Construction Photos Survive  
Prior to January 1925**

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# St. Francis: Design & Construction

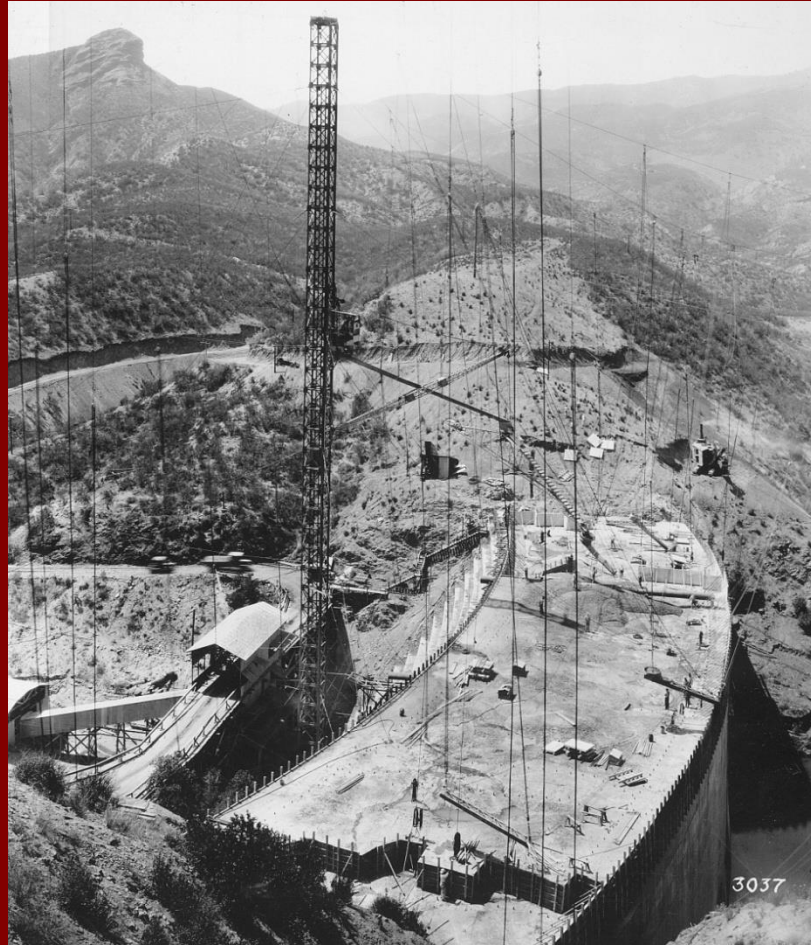
## Circa January 1925





# St. Francis: Design & Construction

## No Cut-off Trenches – No Expansion Joints



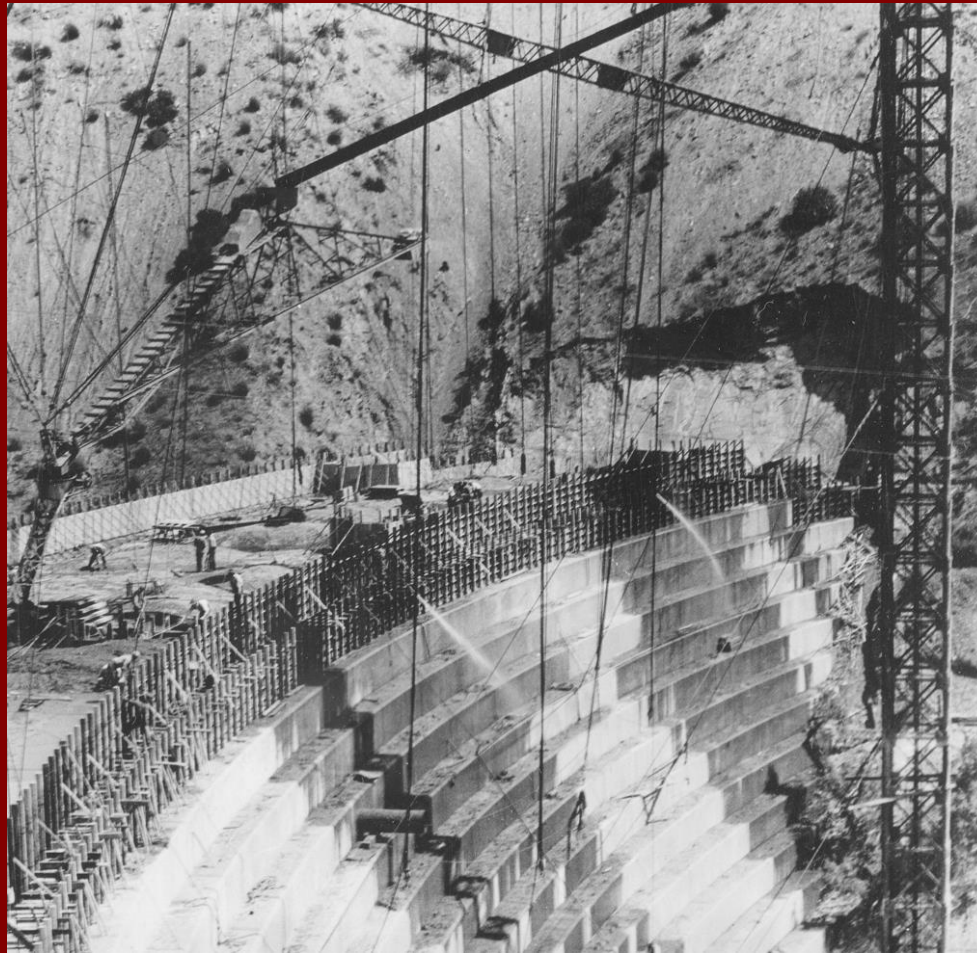
# St. Francis: Design & Construction

## No Cut-off Trench – West Side Abutment



# St. Francis: Design & Construction

## East side excavation





# St. Francis: Design & Construction

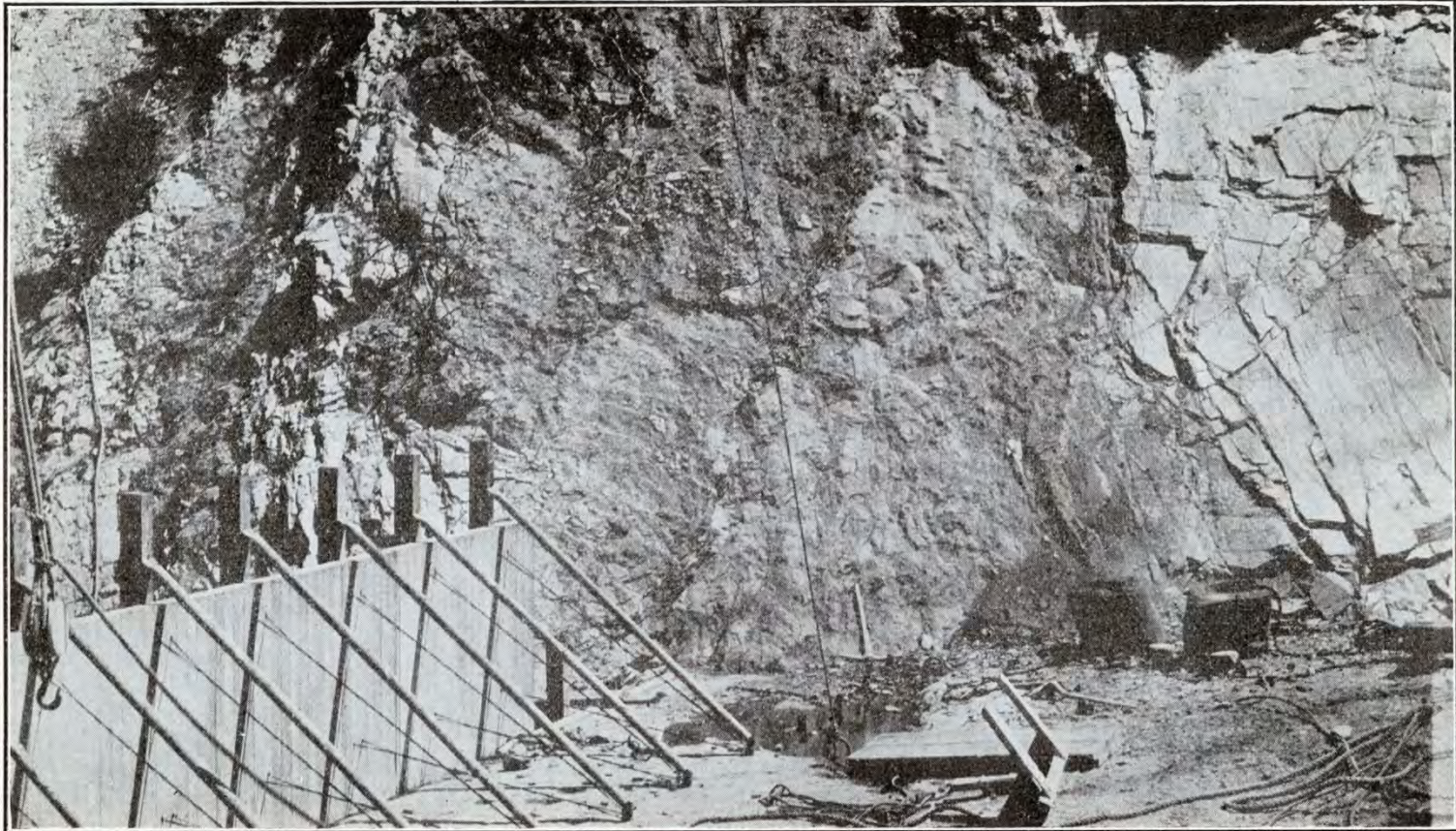
## East side excavation





# St. Francis: Design & Construction

## Fractured Schist: “Heavy Ground”



CONSTRUCTION VIEW SHOWING SHAPING OF EAST ABUTMENT AT UPSTREAM WALL.



# Gravity Dams and Uplift

## The Austin Dam (PA)

### Failure by Uplift Sept 30, 1911





# Gravity Dams and Uplift

## Austin PA Disaster 1911



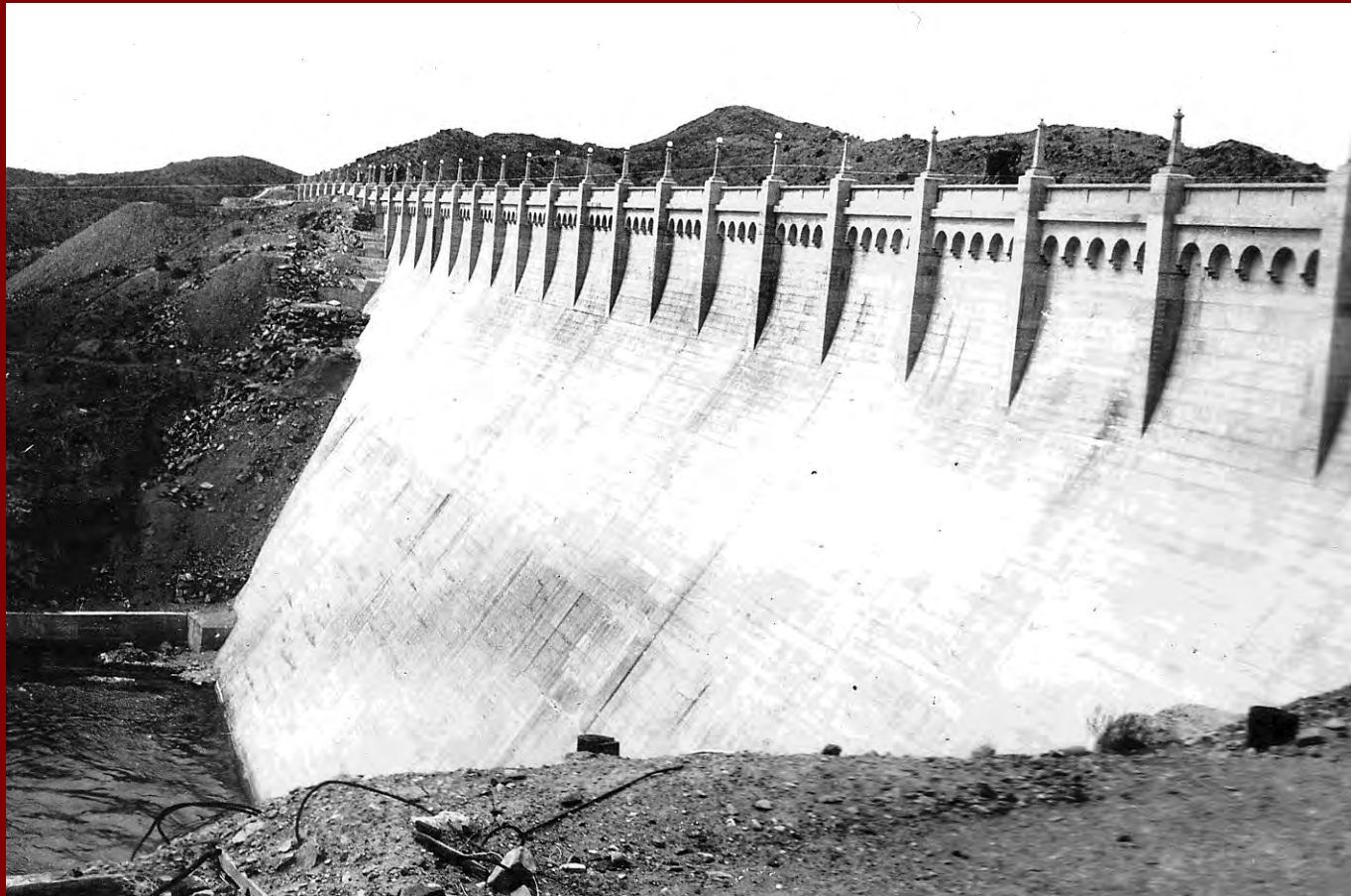
# Gravity Dams and Uplift

## Austin Dam Disaster – 78 dead



# Gravity Dams and Uplift

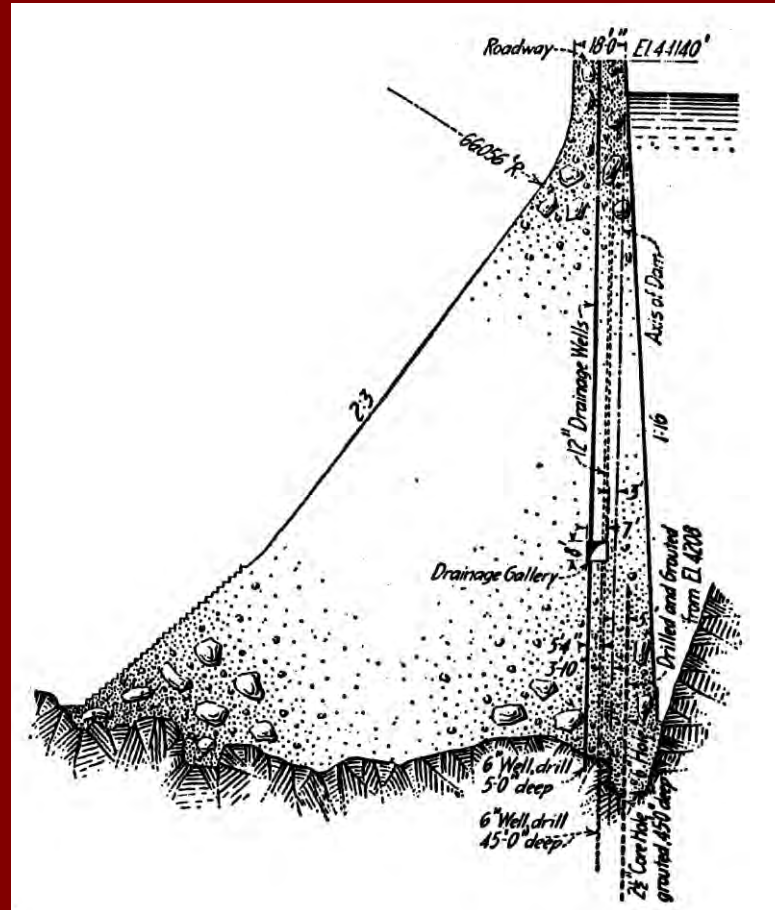
## Elephant Butte Dam 1916





# Gravity Dams and Uplift

## Elephant Butte Dam – Countering Uplift



# Gravity Dams and Uplift

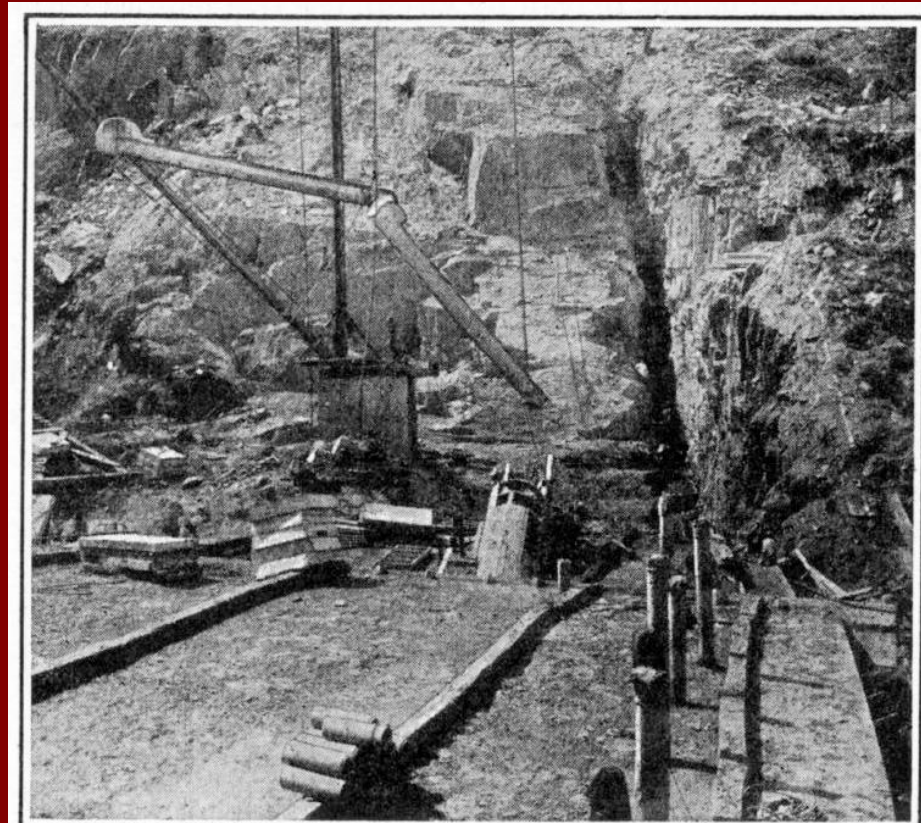
## Exchequer Dam – 1923-25

### Merced Irrigation District



# Gravity Dams and Uplift

## Exchequer Cut-off Trench & Drainage (1923)

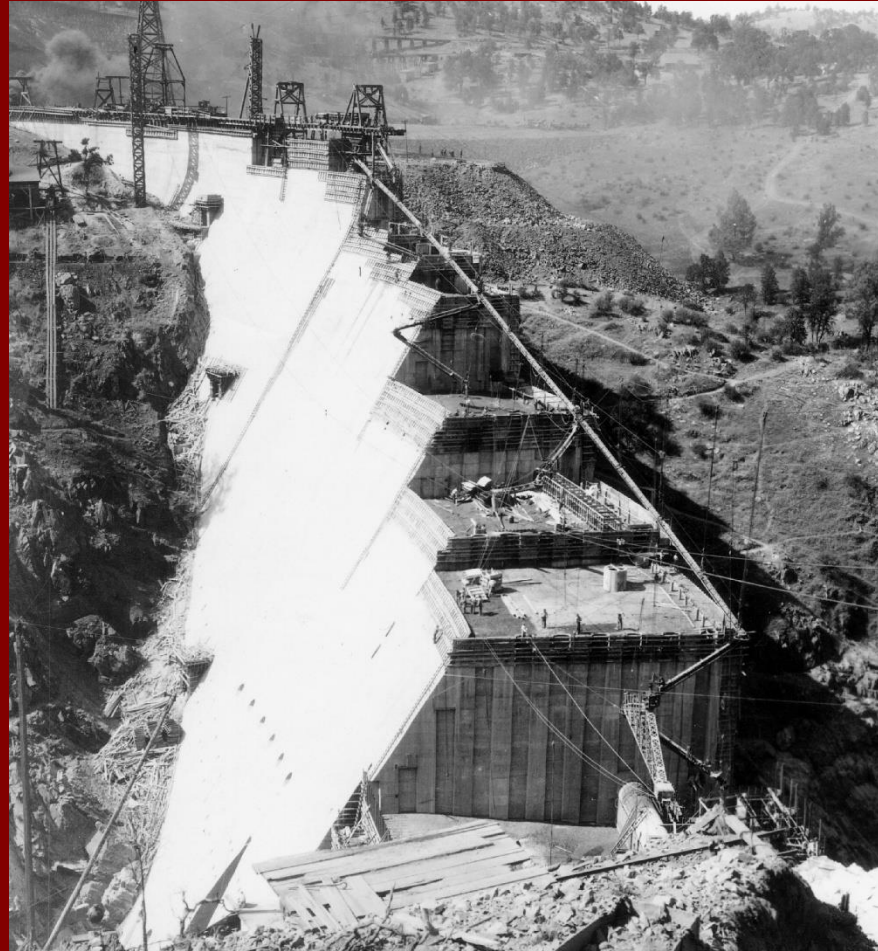


EXCAVATION FOR CUTOFF WALL AT NORTH SIDE  
Curb-walls for bonding successive pours also shown



# Gravity Dams and Uplift

## Don Pedro Dam 1922-23



# Gravity Dams and Uplift

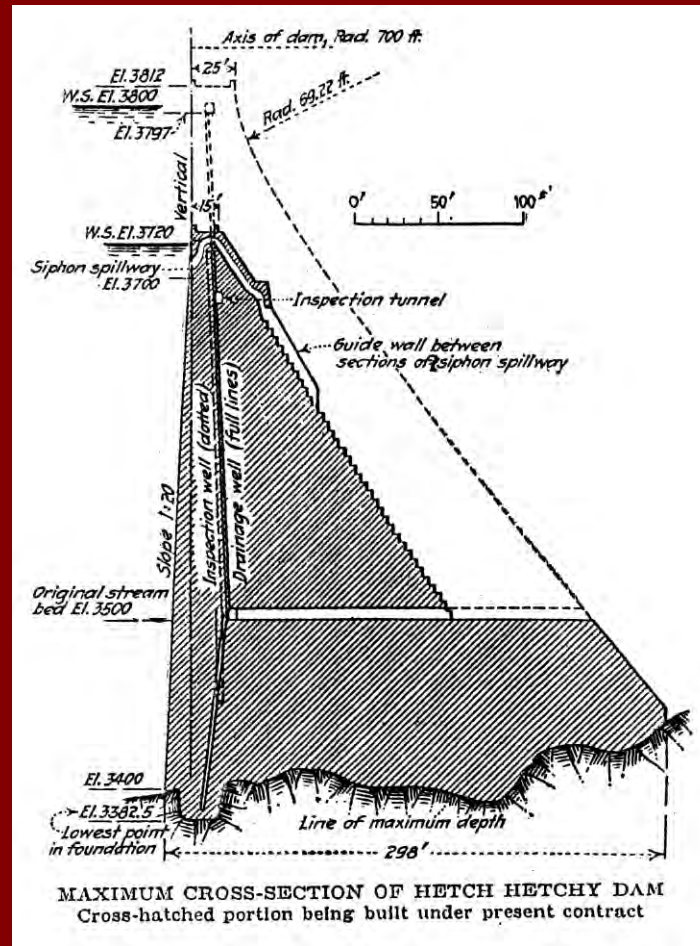
## San Francisco's O'Shaughnessy Dam





# Gravity Dams and Uplift

## O'Shaughnessy (Hetch Hetchy) Dam 1923





# Gravity Dams and Uplift

## O'Shaughnessy Dam Cutoff Trench (ENR)



# Gravity Dams and Uplift

## O'Shaughnessy Dam Drainage Blocks



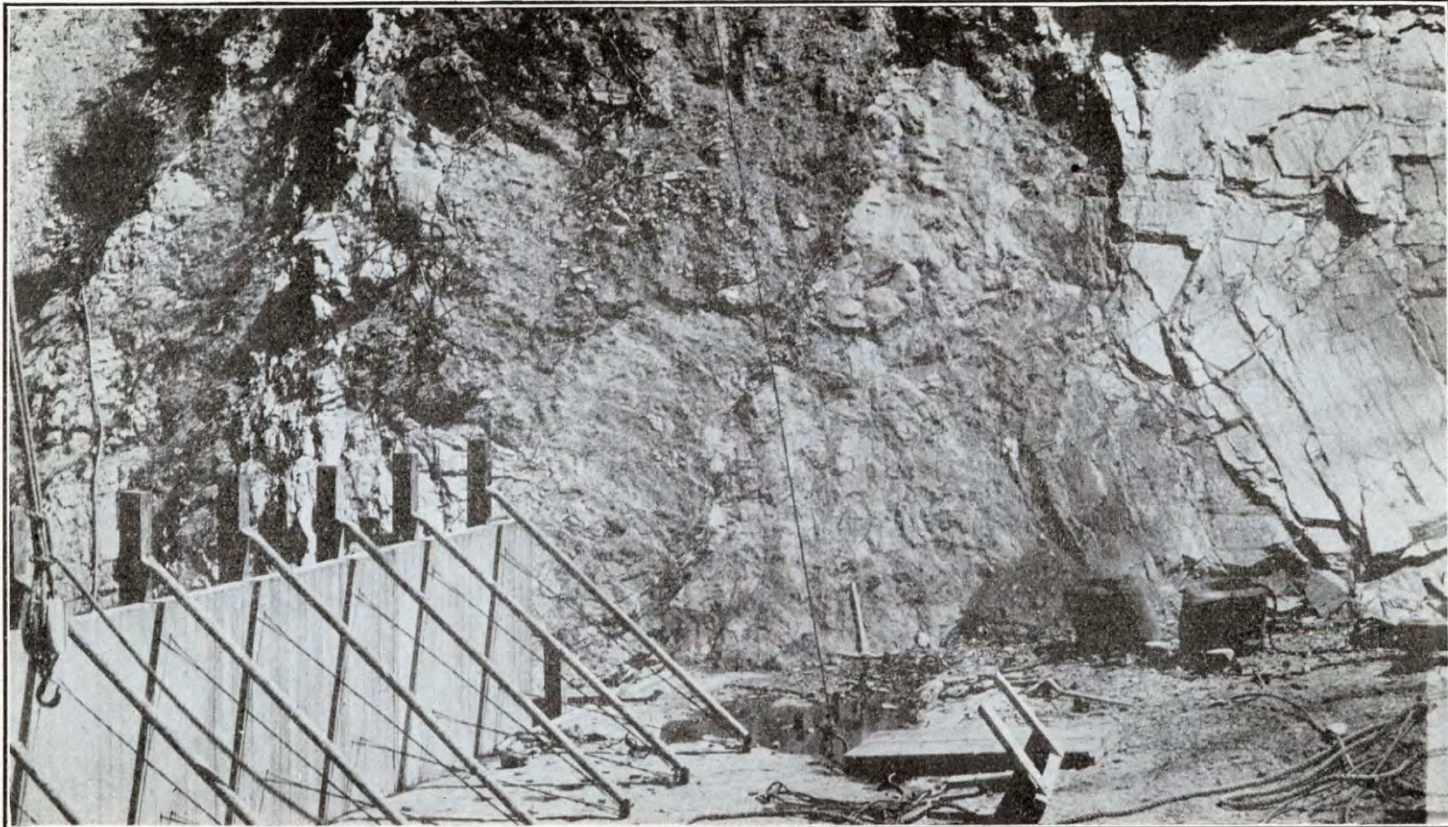
7932. H.H. Dam. Inclined drain of precast porous conc. blocks

U.S. Reclamation, June



# St. Francis: Design & Construction

## Fractured Schist: “Heavy Ground”



CONSTRUCTION VIEW SHOWING SHAPING OF EAST ABUTMENT AT UPSTREAM WALL.



# Gravity Dams and Uplift

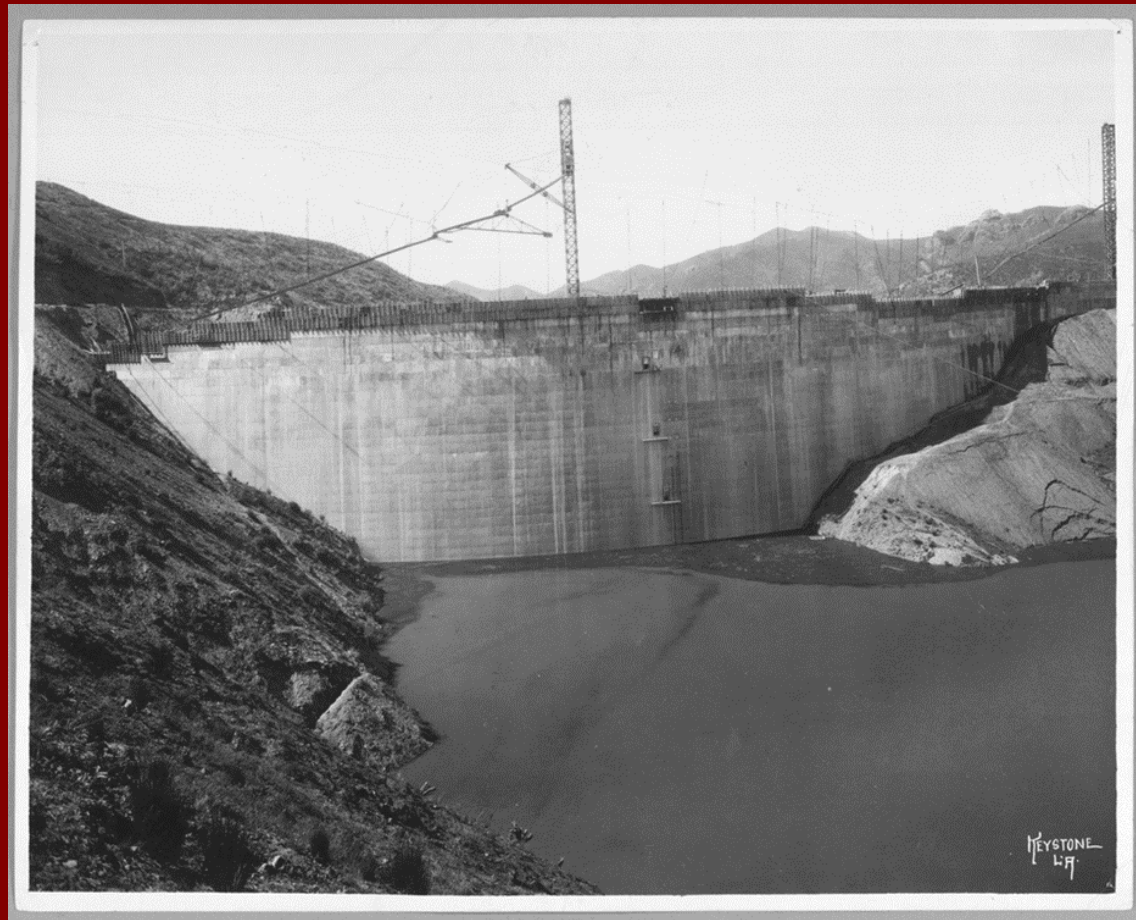
**Design and construction of  
O'Shaughnessy Dam accomplished  
without review by the State Engineer**

**The “Municipal Exemption” did not  
necessarily foster deficient design**

**Privilege and Responsibility**

# St. Francis: Design & Construction

**St. Francis Dam Completed Spring 1926**



# **St. Francis Reservoir**

## **Not Completely Filled until March 1928**





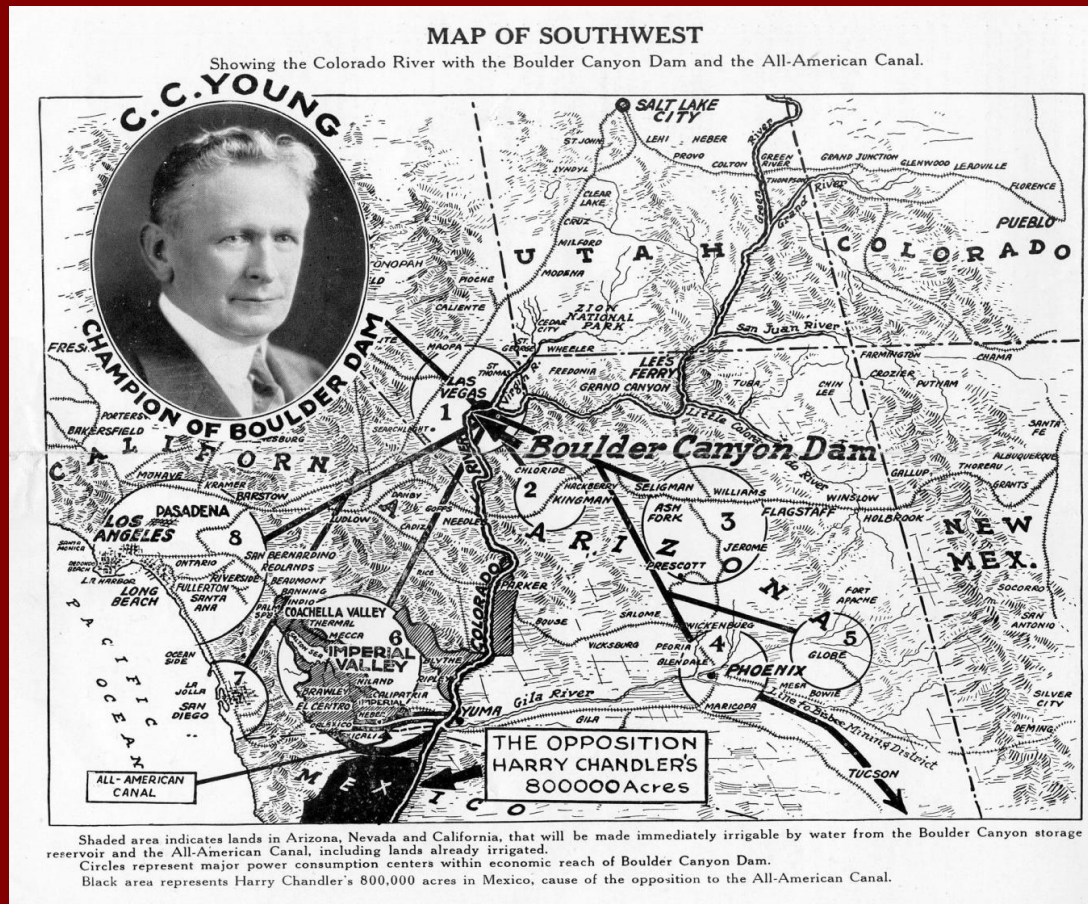
# Mulholland: March 13th...

## A Career Ends...



# Governor's Commission

## Gov. C. C. Young – Dam Politics 1926



# Dam Politics...

## Governor Young – Dam Politics 1926

FUTURE of SOUTHERN CALIFORNIA  
DEPENDENT UPON BOULDER DAM-  
ALL AMERICAN CANAL DEVELOP-  
MENT ON THE COLORADO RIVER.

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### C. C. Young an Old and Tried Friend of Development

Lieutenant-Governor C. C. Young has long been an enthusiastic and out-spoken advocate of the Boulder Dam-All American Canal and Metropolitan Water District Bill. This is true of no other candidate. He is no eleventh hour convert. He visited the Colorado and Imperial Valley and made a thorough study of every phase of the project. If elected Governor he will be qualified to and will at once take a position of leadership in the critical fight for its speedy consummation. His friends, associates and supporters embrace groups which have long fought for the development of the Colorado River in the public interest and along the sound lines provided in the Swing-Johnson Bill. He is under no obligation, express or implied, direct or indirect, to the forces and influences which would delay or defeat the development.

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*Vote For*  
**C. C. YOUNG**  
FOR  
**GOVERNOR**

Republican Primaries, August 31, 1926



# Governor's Commission

**Gov. Young appoints A.J. Wiley to Chair an investigation of the disaster on March 16**

**Wiley was a respected engineer who had served as a consultant for Boulder Dam**

**Wiley meets with Young on Sunday March 18**

**The Commission convenes the next day**

**The Commission's Report is completed Sunday March 25 (!)**

# Governor's Commission

## Report of the Commission

Appointed by

GOVERNOR C. C. YOUNG

to Investigate the

## Causes Leading to the Failure of the St. Francis Dam

NEAR SAUGUS, CALIFORNIA

A. J. WILEY, Chairman, Boise, Idaho  
*Consulting Engineer*

GEO. D. LOUDERBACK, Berkeley, California  
*Professor of Geology, University of California*

F. L. RANSOME, Pasadena, California  
*Professor of Economic Geology, California Institute of Technology*

F. E. BONNER, San Francisco, California  
*District Engineer, U. S. Forest Service*  
*California Representative of Federal Power Commission*

H. T. CORY, Los Angeles, California  
*Consulting Engineer*

F. H. FOWLER, San Francisco, California  
*Consulting Engineer*

# Governor's Commission

**Blame placed: The West Side/Fault**





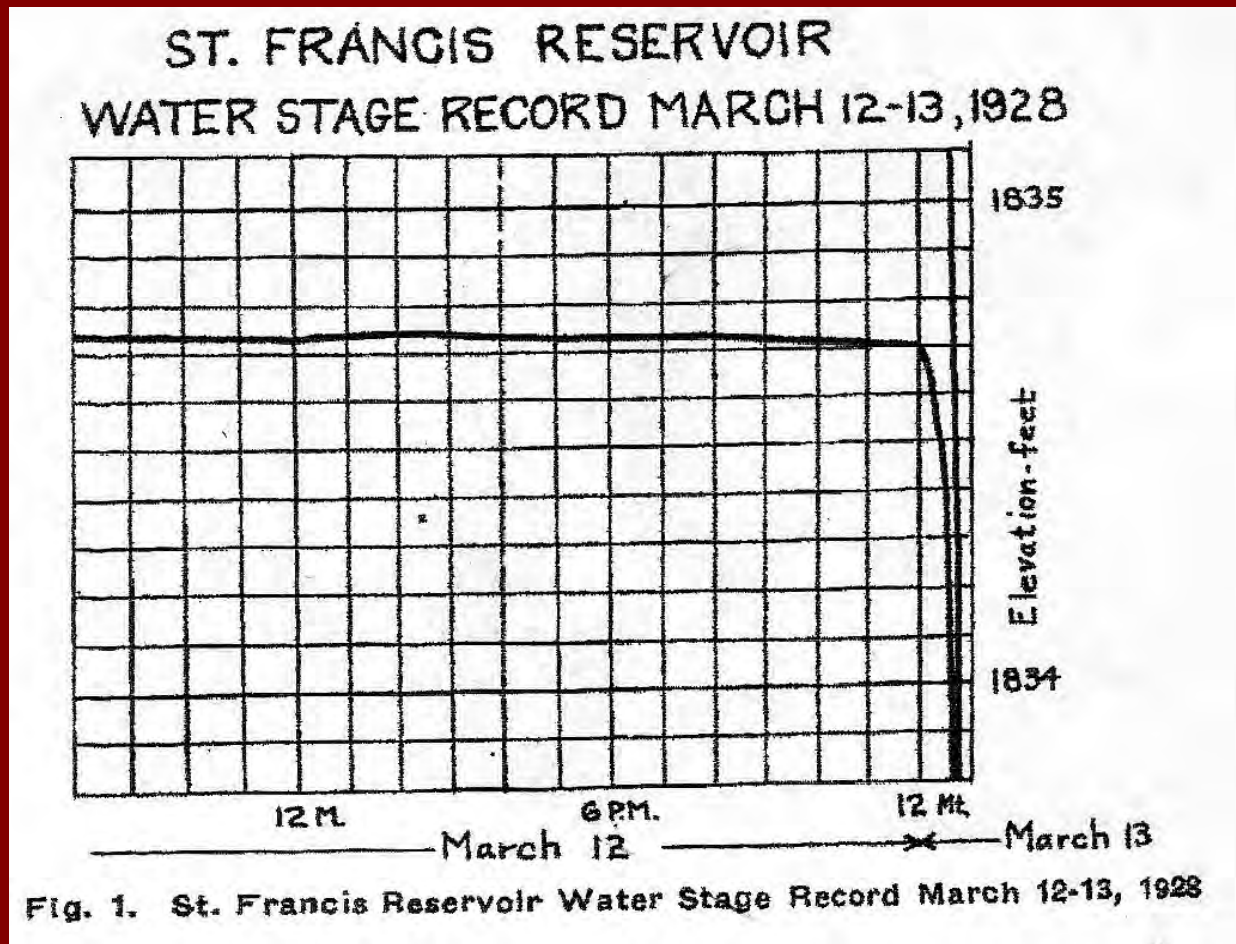
# Governor's Commission

## The Water Gauge



# The Governor's Commission

## A Drop in Reservoir Level (?)



# Governor's Commission

## CONCLUSIONS

1. The failure of St. Francis Dam was due to defective foundations.
2. There is nothing in the failure of the St. Francis Dam to indicate that the accepted theory of gravity dam design is in error or that there is any question about the safety of concrete dams designed in accordance with that theory when built upon even ordinarily sound bed rock. On the contrary, the action of the middle section which remains standing, even under such adverse conditions, is most convincing evidence of the stability of such structures when built upon firm and durable bed rock.



# Governor's Commission

**“Most convincing evidence of the stability of such structures when built upon firm and durable bedrock...”**



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# **Governor's Commission**

## **A Shared Perspective**

**Letter from W. L. Huber to J. R. Freeman**

**March 21, 1928**

**“briefly the whole story is clearly one of lack of  
suitable foundations.”**

**“the center section of the dam... is the one  
great witness of the stability of a gravity  
section founded on a solid foundation.”**

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# Governor's Commission

Engineering News-Record, April 19, 1928

## All St. Francis Dam Reports Agree as to Reason for Failure

(Defective Foundations Generally  
Accepted as the Cause of  
Failure of Structure)

OF THE various boards and commissions appointed to investigate the St. Francis dam disaster as listed in *Engineering News-Record*, April 5, p. 561, reports have now been filed by those appointed by Governor Young, the Los Angeles County district attorney, the Los Angeles City Council,



# Coroner's Jury

## Agrees with the Governor's Commission



# An Alternative View

## Eastside/Uplift/Schist Alternative

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### St. Francis Dam Failure

At Midnight, March 12-13, 1928

By C. E. GRUNSKY and E. L. GRUNSKY  
*Consulting Engineers of San Francisco*

*Accompanied by Report on Geology of St. Francis Damsite by Dr. Bailey Willis,  
Geologist and Professor Emeritus, Stanford University*

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**Editor's Note**—C. E. Grunsky, 1924 President of the American Society of Civil Engineers, made this investigation and report, in conjunction with his son, E. L. Grunsky, for Ventura County, and the Santa Clara Water Conservancy District.

Reference is hereby made to detailed drawings and illustrations in previous articles on the St. Francis Dam failure in the March 25th, April 10th, and May 10th issues.

The reports included 41 photographs and 5 diagrams. Of the illustrations in this publication only 13 are from the reports.

clusions and our own, which are in substantial agreement, were reached independently.

In preparing this report we have not had before us the topographic survey of the damsite, nor the details of the design of the dam. Neither have we seen the results of resurveys which, it is understood, have been made since the failure of the dam, nor have we had access to the testimony presented at the Coroner's hearings. We have not therefore discussed such

# An Alternative View

## Eastside/Uplift/Schist Alternative

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### Report on the Geology of St. Francis Damsite, Los Angeles County, California

By DR. BAILEY WILLIS  
*Geologist and Professor Emeritus, Stanford University*

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The rocks at the St. Francis damsite are too weak safely to support a dam of the concrete arch-gravity design. This fact has been made evident by the failure. It is equally evident from inspection of the topography of the site and of the rocks as now exposed. The following facts are the basis of this opinion:

to parting on its easy cleavages. The schist is therefore traversed by innumerable minute fissures, into which water would intrude under pressure and by capillary action. The rock would not soften, however.

(g) The east abutment is located on a landslide. It was an old slide which had become inactive, and



# An Alternative View

## Eastside/Uplift/Schist Alternative

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### Theories of the Cause and Sequence of Failure of the St. Francis Dam

By CHARLES H. LEE, *Consulting Hydraulic Engineer, San Francisco*

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**Editor's Note**—Charles H. Lee graduated from the University of California, with the degree of B.S. in C.E., in 1905. His early experience was with the Water Resources Branch, U. S. Geological Survey, and later on the Los Angeles Owens river aqueduct, from its inception to final completion in 1912. For the past 15 years he has had a general practice as hydrau-

the most definitely developed theories of the causes of failure and the sequence of events in the breaking-up of the dam.

#### Results of Latest Surveys

It is to be hoped that the latest surveys will give a complete picture of the situation

# An Alternative View

## The Eastside Slide...





# An Alternative View

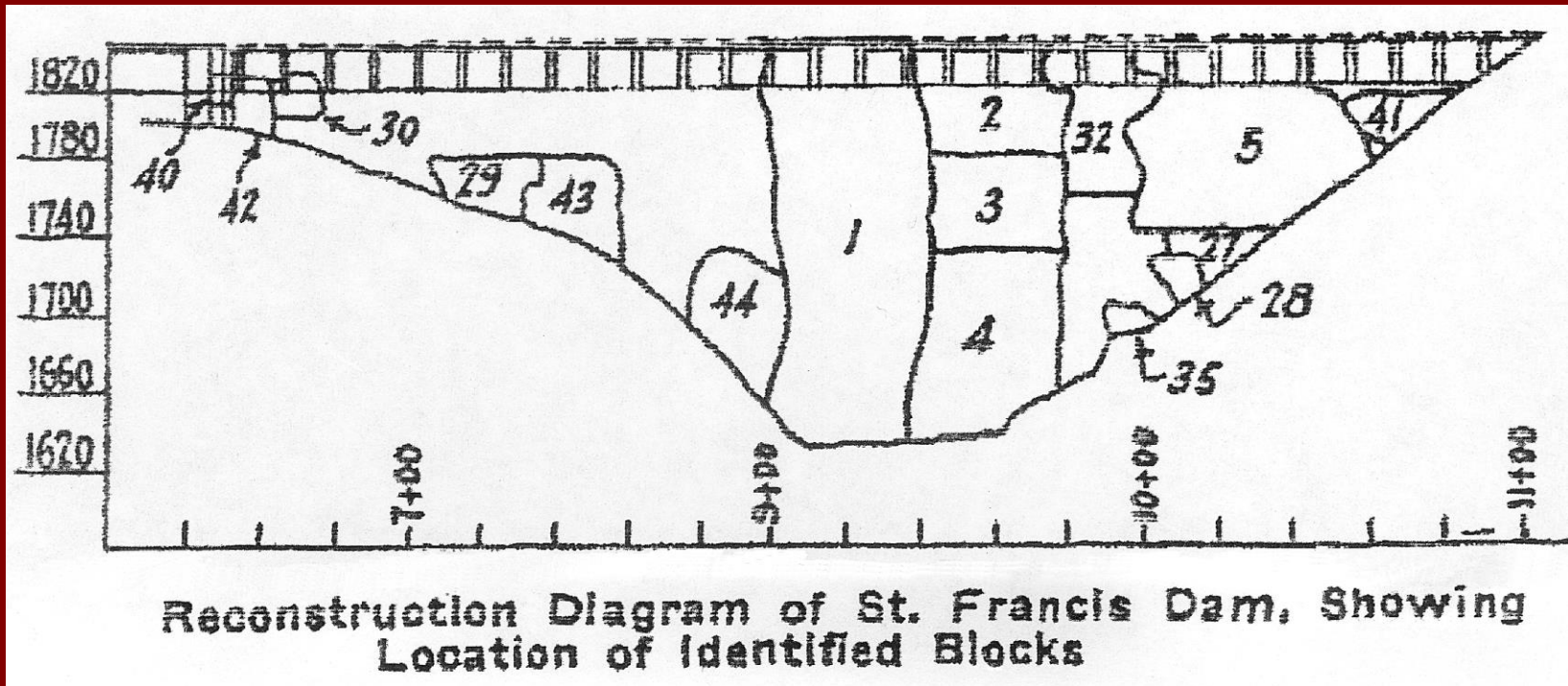
**Bailey Willis: Western Const. News June 1928**



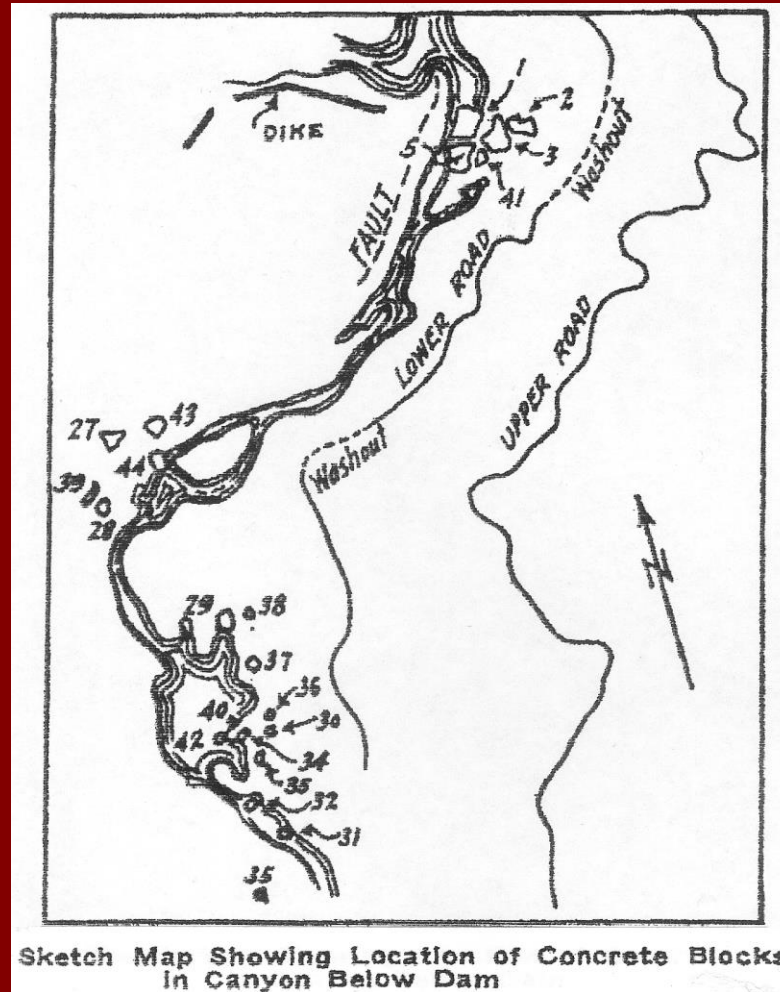
**Fig. 8. East Abutment Showing Outline of Old Slide Above Present Slide**



# An Alternative View – Block 35

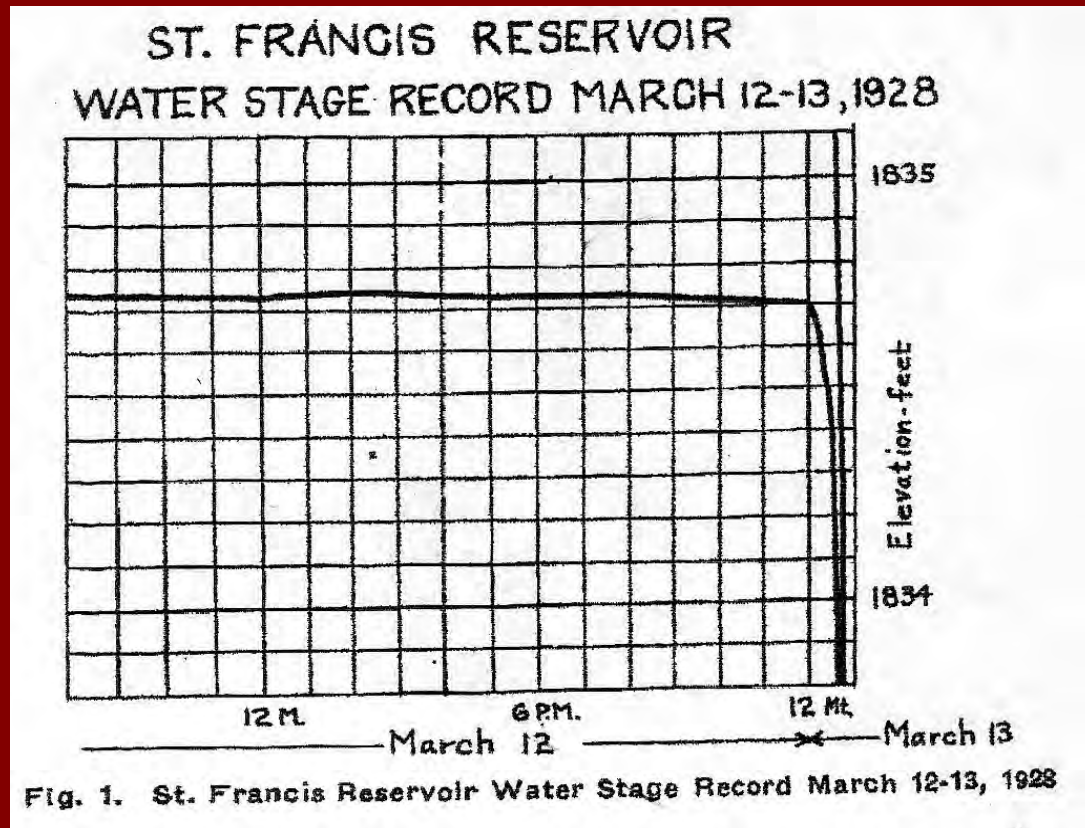


# An Alternative View – Block 35



# An Alternative View

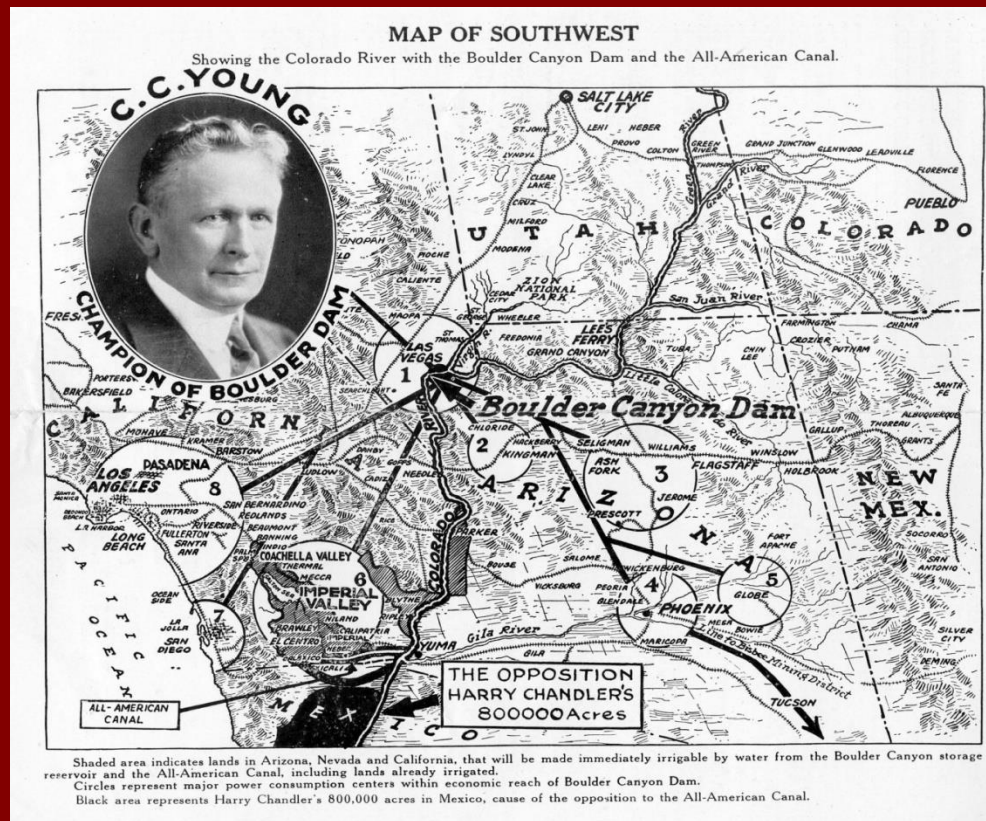
## A Drop in Reservoir Level ? Or a Rising Dam?






# St. Francis and Boulder Dam

## Why the Rush to Judgment by the Governor's Commission?



# St. Francis and Boulder Dam

## Telegram to Swing from State Engineer Mar 26

CLASS OF SERVICE DESIRED		<b>WESTERN UNION</b>  <b>TELEGRAM</b>	NO.	CASH OR CHG
TELEGRAM			CHECK	
DAY LETTER	XX			
NIGHT MESSAGE				
NIGHT LETTER		TIME FILED		

Patrons should mark an X opposite the class of service desired; OTHERWISE THE MESSAGE WILL BE TRANSMITTED AS A FULL-RATE TELEGRAM

NEWCOMB CARLTON, PRESIDENT      GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

Send the following message, subject to the terms on back hereof, which are hereby agreed to

1111 SUN FINANCE BUILDING  
LOS ANGELES CALIFORNIA  
MARCH 26TH 1928

HONORABLE PHIL D SWING  
CONGRESSMAN ELEVENTH CALIFORNIA DISTRICT  
WASHINGTON D C

REPORT OF INVESTIGATING COMMITTEE ST FRANCIS DAM JUST  
COMPLETED BUT NOT YET IN HANDS OF GOVERNOR YOUNG STOP  
STATEMENT TO YOU TO THE EFFECT THAT THERE IS ABSOLUTELY NO  
RELATION BETWEEN THE FAILURE OF THE ST FRANCIS DAM AND THE  
SAFETY OF THE PROPOSED BOULDER CANYON DAM CAN BE SENT TO  
BEST ADVANTAGE TOMORROW MORNING AFTER CONFERENCE BETWEEN  
GOVERNOR YOUNG AND A J WILEY CHAIRMAN OF INVESTIGATING  
COMMISSION STOP PLEASE WIRE ADVICE IF THIS SATISFACTORY OR  
IF STATEMENT ABSOLUTELY NECESSARY YET TODAY

EDWARD HYATT  
STATE ENGINEER  
1111 SUN FINANCE BUILDING  
LOS ANGELES CALIFORNIA



# St. Francis and Boulder Dam

**“Absolutely No Relation...”**

REPORT OF INVESTIGATING COMMITTEE ST FRANCIS DAM JUST  
COMPLETED BUT NOT YET IN HANDS OF GOVERNOR YOUNG STOP  
STATEMENT TO YOU TO THE EFFECT THAT THERE IS ABSOLUTELY NO  
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COMMISSION STOP PLEASE WIRE ADVICE IF THIS SATISFACTORY OR  
IF STATEMENT ABSOLUTELY NECESSARY YET TODAY



# St. Francis and Boulder Dam

Gov. Young to Swing: March 27

“Attributes failure... entirely to its foundation”

Form 1205-A

CLASS OF SERVICE DESIRED	
DOMESTIC	CABLE
TELEGRAM	FULL RATE
DAY LETTER	DEFERRED
NIGHT MESSAGE	CABLE LETTER
NIGHT LETTER	WEEK END LETTER

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

# WESTERN UNION

NEWCOMB CARLTON, PRESIDENT J. C. WILLEVER, FIRST VICE-PRESIDENT

NO.	CASH OR CHG.
CHECK	
TIME FILED	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

March 27, 1928.

Night Letter Paid Charge Governor's Office

Honorable Phil D. Swing,  
Congressman Eleventh California District,  
Washington, D. C.

Report of investigating commission St. Francis Dam attributes failure of dam entirely to its foundation the formation of which was of such a nature that even when dry its strength was less than required for safety and when wet became soft and ~~weak~~ Stop I have positive assurance from A. J. Wiley, Chairman of Commission and of Dr. F. L. Ransome, Professor of Economic Geology at California Technical Institute, who is also a member of St. Francis Dam investigating commission, both of whom have examined the Boulder and Black Canyon dam sites that the bed rock there is so sound, hard and durable and so different from the very soft foundation of the St. Francis dam, that the failure of St. Francis Dam need cause no apprehension whatever regarding the safety of the proposed Boulder Canyon dam Stop The report of the investigating commission also states that there is nothing in the failure of the St. Francis Dam to indicate that the accepted theory of gravity dam design is in error or that there is any question about the safety of ~~gravity~~ dams designed in accordance with that theory when built upon ordinarily sound bed rock but that on the contrary the action of the middle section of the St. Francis Dam which remained standing even under such adverse conditions is most convincing evidence of the stability of such structures when built upon such firm and durable bed rock as is present in Boulder Canyon Stop Full text of report by mail.

G. G. Young  
Governor

# St. Francis and Boulder Dam

Gov. Young to Swing: March 27

“the middle section... is most convincing evidence of the stability of such structures...”

CLASS OF SERVICE DESIRED	
DOMESTIC	CABLE
TELEGRAM	FULL RATE
DAY LETTER	DEFERRED
NIGHT MESSAGE	CABLE LETTER
NIGHT LETTER	WEEK END LETTER

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

## WESTERN UNION

NEWCOMB CARLTON, PRESIDENT J. C. WILLEVER, FIRST VICE-PRESIDENT

Form 1206-A

NO.	CASH OR CHG.
CHECK	
TIME FILED	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

**Night Letter Paid Charge Governor's Office** **March 27, 1928.**

Honorable Phil D. Swing,  
Congressman Eleventh California District,  
Washington, D. C.

Report of investigating commission St. Francis Dam attributes failure of dam entirely to its foundation the formation of which was of such a nature that even when dry its strength was less than required for safety and when wet became soft and ~~weak~~ *caution* Stop I have positive assurance from A. J. Wiley, Chairman of Commission and of Dr. F. L. Ransome, Professor of Economic Geology at California Technical Institute, who is also a member of St. Francis Dam investigating commission, both of whom have examined the Boulder and Black Canyon dam sites that the bed rock there is so sound, hard and durable and so different from the very soft foundation of the St. Francis dam, that the failure of St. Francis Dam need cause no apprehension whatever regarding the safety of the proposed Boulder Canyon dam Stop The report of the investigating commission also states that there is nothing in the failure of the St. Francis Dam to indicate that the accepted theory of gravity dam design is in error or that there is any question about the safety of ~~gravity~~ dams designed in accordance with that theory when built upon ordinarily sound bed rock but that on the contrary the action of the middle section of the St. Francis Dam which remained standing even under such adverse conditions is most convincing evidence of the stability of such structures when built upon such firm and durable bed rock as is present in Boulder Canyon Stop Full text of report by mail.

G. G. Young  
Governor

# St. Francis and Boulder Dam

Swing to Gov. Young: March 28

“...just the information which I desire.”

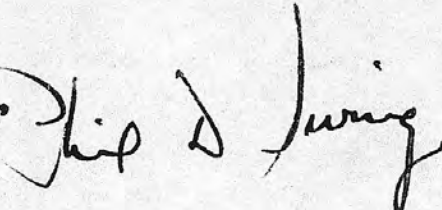
Hon. C. C. Young,  
Governor,  
Sacramento, Calif.

My dear Governor:

Permit me to thank you for your wires  
with reference to the St. Francis Dam disaster.

I think the report of the Engineering  
Commission will give me just the information which I de-  
sire.

Sincerely,

A handwritten signature in cursive script, reading "Philip D. Swing". The signature is written in dark ink and is positioned to the right of the word "Sincerely,".



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# St. Francis and Boulder Dam

## Senator Reed Smoot (Utah)

*Chicago Tribune*, May 1, 1928

**“Senator Smoot made comparisons with the St. Francis Dam of the city of Los Angeles, [the] breaking of which cost the lives of between 400 and 500 persons...**

**Senator Smoot pointed out that William Mulholland, the engineer who selected the site of St. Francis Dam and approved its foundation as safe and adequate, was one of the engineer witnesses before congressional committees who vouched for the feasibility of the Boulder Canyon project.”**

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# St. Francis and Boulder Dam

**Senator Hiram Johnson (California)**

*Speech on Senate Floor, May 22, 1928*

**“It has been a rather a sad thing that... the senior Senator from Utah [Reed Smoot]... would seize upon the St. Francis Dam disaster in the San Francisquito Canyon in California in order to read a horrible lesson into dam construction in this country.”**

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# Colorado River Board

## **The Sibert Commission** **(Headed by Major Gen. William Sibert)**

**Authorized by Congress in May 1928 to  
provided a independent review of the BCP**

**Report due in 6 months**  
**(December 1928)**

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# Passage of BCPA

**Mulholland resigns from BWWS – Nov. 13, 1928**

**Sibert Commission endorses BCPA Dec 1<sup>st</sup>**

**Congress Convenes on Dec. 5<sup>th</sup>**

**Senate passes BCPA Dec. 14<sup>th</sup> (64 to 12)**

**(Senator Smoot abstains)**

**House passes Senate bill Dec. 18<sup>th</sup> (160 to 122)**

**President Coolidge signs BCPA Dec. 21<sup>st</sup>**

**St. Francis Dam Disaster now far distant in  
the rearview mirror...**

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# Colorado River Board

## **The Sibert Commission A Key Recommendation:**

**Decrease stress in  
Boulder Dam design from  
40 tons/sqft to 30 tons/sqft  
Not implemented, but...**

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# Hoover Dam: Massive Enough?





# State Regulation and Reaction

## **The Perils of Dam Safety Regulation**

**How much is enough?**

**How much is too much?**

**How to keep Innovation alive?**

# State Regulation and Reaction

**State Engineer Hyatt April 1928**

“[T]he failure of the St. Francis Dam has greatly disturbed public confidence in the safety of all dams...Even among competent engineers there will be a tendency toward undue conservatism...”

“we must exercise great care to avoid insisting upon safeguards beyond the actual needs since many meritorious projects might be thereby rendered financially infeasible...”

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# State Regulation and Reaction

## **1931 ASCE Symposium on “Public Supervision of Dams”**

M. M. O'Shaughnessy referred to California's new dam safety law (with no “Municipal Exemption”) as “most drastic” and opined that St. Francis catastrophe had created “an hysteria” whereby citizens and legislators “have practically lost their heads on the subject of dam design and construction...”

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# State Regulation and Reaction

## **1931 ASCE Symposium on “Public Supervision of Dams”**

A. W. Markwart, Vice Pres Pacific Gas and Electric

“it is not improbable that the tendency will be to require dams to be constructed stronger than actually necessary. Such excess strength can only be had from capital expenditures greater than have been required in the past...”

# State Regulation and Reaction

## 1931 ASCE Symposium on

### “Public Supervision of Dams”

In 1924 Swiss-trained Fred Noetzli had opined that  
“the gravity dam is an economic crime.”

Now he was concerned that California’s new dam  
safety law would promote massive gravity  
technology at the expense of other alternatives:  
“there is no good reason why the most expensive  
type, namely the gravity dam, should receive first  
and sometimes sole consideration.”

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# State Regulation and Reaction

## **1931 ASCE Symposium on “Public Supervision of Dams”**

In his comments, Noetzli implicitly acknowledges the success of the Governor's Commission in championing the great strength of concrete gravity technology...

Gravity Dam technology survives a disaster that kills some 400 people, and its standing/reputation is actually enhanced in the wake of St. Francis...

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# Massive New Deal Dams

## Shasta Dam 1945



# Massive New Deal Dams

## Grand Coulee 1941



# St. Francis Dam

## The Remains – Symbol of Strength?





# Or A Grim Reminder?

**Remains Demolished May 1929**





# Boulder/Hoover Dam 1931-35

