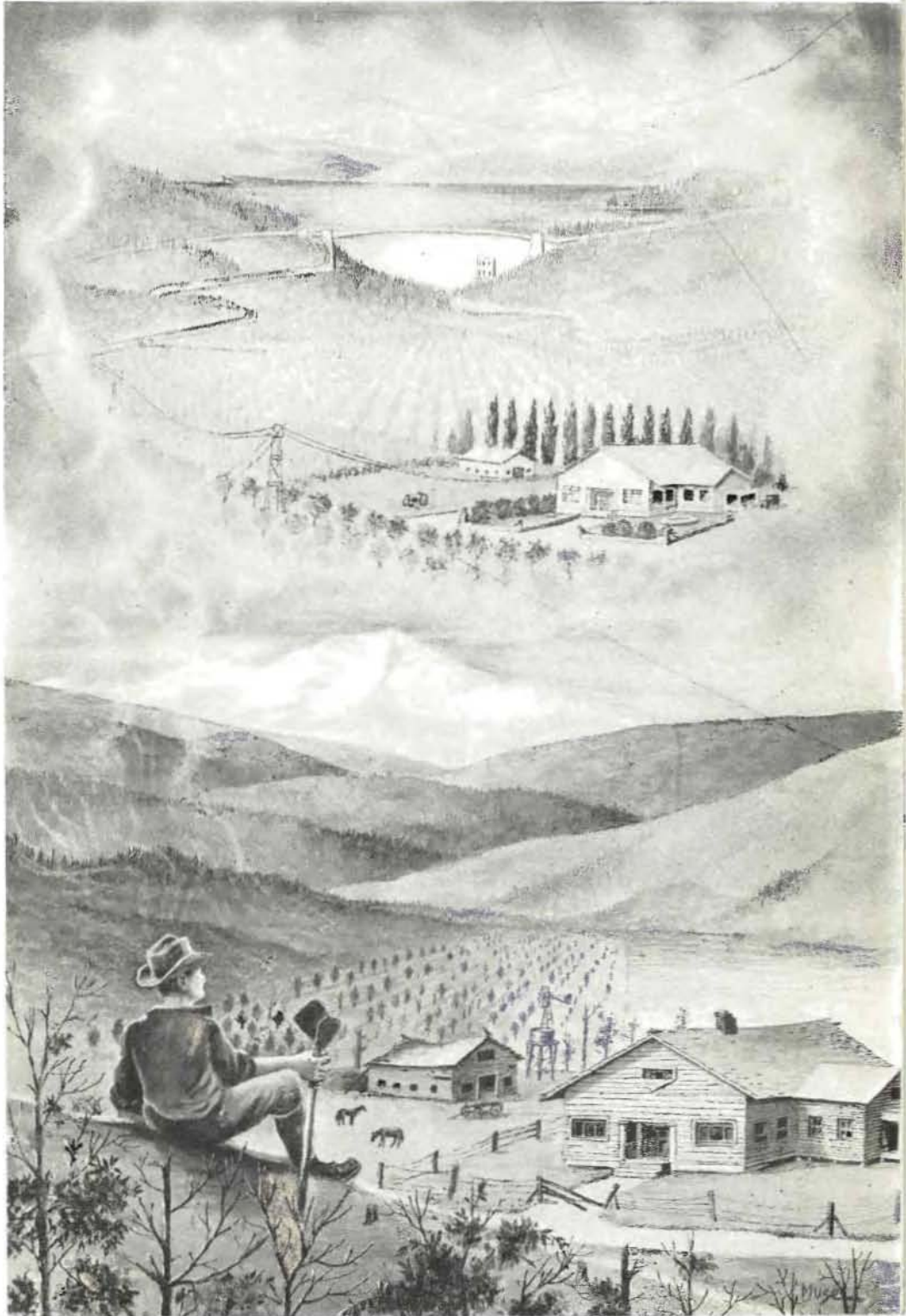


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\$66,000,000 *To Workers for Improvements*

The Department of Public Works in 1931 Has Set \$48,000,000 of This Amount in Motion Against the Unemployment Situation and \$18,000,000 Through the Counties

By JAMES I. HERZ, Deputy Director of Public Works

AN ORDERLY program of public improvements, advanced on schedule and expanded to the maximum of budget allowances, represents the California state administration's contact with the unemployment problem.

The situation, now growing in tenseness, was anticipated last January when Governor Rolph asked the Legislature to pass building appropriations as emergency measures and make the money immediately available for use.

Outstanding and independent of any figures hereafter mentioned, the San Francisco Bay Bridge, a \$75,000,000 project, was launched, given its preliminary financing, and is being now advanced to the stage of construction.

ALL WORK ADVANCED

The schedule for teachers colleges, hospitals, office buildings, armories and relief homes was advanced by a full year.

The \$48,000,000 program of the Department of Public Works was set in motion without delay. Every form of expenditure and construction was understood to have the creation of employment as a major objective. Today, \$46,000,000 of \$48,000,000 total has been expended or is accruing under contracts.

On the Division of Highways fell the principal responsibility for the expenditures of the millions and the employment of the tens of thousands of men. Facing the biennium

with an income of \$64,118,943.28, the Division was able to plan wisely, and the mobility of its funds enabled it to proceed without delay.

Equally important was the share of gas tax money falling by law to the several counties of the State. For the last biennium, this total was \$31,844,342.42. The money is apportioned to the counties on the basis of automobile registrations. It becomes the backbone of their local highway construction and maintenance.

NOT COOPERATIVE

It is not involved in cooperative highway districts or in such allocations as the Highway Division may make directly in aid of such projects as, for instance, the so-called "bottle neck" problem of San Francisco, relating to the congestion of traffic in the Colma-Daly City district. The State contributed \$200,000 to this enterprise, which, when matched by the local appropriation, makes a \$500,000 item to apply against the employment problem in

that vicinity. Following the lead of the State, San Francisco voted \$2,000,000 bonds for relief work.

Los Angeles came forward in fine spirit with \$5,000,000 for emergency work as against the unemployment situation. The example and actual encouragement given to the several communities by the State, appears to have encouraged them to face the situation with practical relief measures.



James I. Herz

Beautiful Trees of Cherokee Lane Spared in Careful Paving Operations

By R. E. PIERCE, District Engineer

THE RECENT completion of grading and paving on Cherokee Lane, a portion of the Golden State Highway in San Joaquin County, north of Stockton, has demonstrated what can be done toward preserving existing trees and still not interfering with our standards of road section and drainage.

The greater portion of the 14 miles of the Cherokee Lane which is on the State highway system is lined with trees, some having been planted many years ago for shade purposes, others being a portion of the natural oaks which originally covered large areas of San Joaquin County, and others being orchard trees planted and maintained by the abutting property owners.

Before starting construction, a detailed field study of line and grade adjustments was made so as to preserve as many of the trees as possible.

"TURNPIKE" SECTION

The road cross-section is the so-called "turnpike" section, which makes use of practically the full width of the 100-foot right of way, by placing shallow draining ditches a foot inside the right of way and then carrying a flat slope from the shoulder edge to the bottom of the ditch.

Practically all the trees which came between the shoulder line, which is eight feet from the edge of the pavement, and the ditch were preserved, except some of the orchard trees which were in many cases planted so closely together that it was impracticable to work around them, and these were thinned out, making room for grading equipment and still not impairing the general effect.

Adjoining the east city limits of Lodi, a 76-foot width of pavement was built as a cooperative project in which city, county and State participated and here all the widening was done on the easterly side of Cherokee Lane to avoid disturbing the more highly developed property on the west. This made necessary the removal of most of the trees on the east side of the road. Also, north of Lodi, there was planted under permit from the State in

1921 a row of oriental plane trees on each side of the road for about one mile to the Mokelumne River. These were so close to the road that it was decided to adjust the center line of pavement to leave one row intact, the westerly row being eliminated.

In these two places it is planned to replace the trees removed by new trees to be planted by the State this fall in the proper position.

SAVED FRONT YARDS

A number of the residences along Cherokee Lane have nicely landscaped front yards with shrubs and lawn. All of these were left practically in their original condition by carrying the side drainage through a metal culvert under the yard.

In general, grades were adjusted so that the trees were not disturbed by filling or cutting around the roots. In cases where the slope came too low, a mound was filled around the base of the tree to protect it.

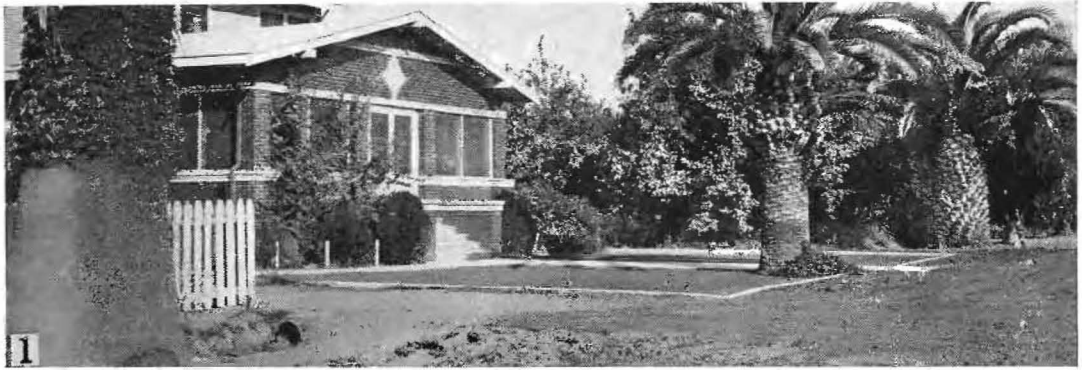
A considerable number of the trees which were left, while in the clear of the two-lane pavement (20 feet wide), will necessarily have to be removed when pavement is widened. It is the intention to plant new trees back of the trees which must eventually be removed so that when the time comes for taking them out, the new trees will have several years' growth, thus eliminating some of the objection to removal of the existing trees.

IN THREE CONTRACTS

The paving on Cherokee Lane was handled by three separate contracts, and the bridges under two contracts.

The joint paving project adjoining Lodi is the first 76-foot width Portland cement concrete pavement on the State highway in northern California. The State had already built a 20-foot pavement through this stretch before the district contract was started. The State contributed to the district the cost of two additional 10-foot lanes through this stretch, making their total participation on the basis of a 40-foot width.

In so far as we can learn, a State record was made on speed of paving the 5.55-mile section along Cherokee Lane.



"CONTRACTOR SPARE THAT TREE" was, in effect, the general order promulgated by the engineers of the Department of Public Works in planning the regrading and paving of fourteen miles of the Cherokee Lane section of the Golden State highway north of Stockton. Care was taken to preserve as far as possible all the arboreal beauty of the roadsides. Picture No. 1 shows how the draining ditch was carried in a pipe under a front yard to preserve lawn and trees. No. 2 shows oak trees saved near Live Oak. In No. 3, where the grading came too low, the trees are seen protected by mounds filled around their bases. No. 4 shows trees preserved near Houston school.

Governor Rolph Completes Visits to 58 County Seats, Keeping His Promise

PRECEDENT established; records broken!

Fifty-eight county seats of the fifty-eight counties of the State of California have now been visited by Governor James Rolph, Jr., an achievement never before accomplished by any Governor of this State!

Wednesday, November 18th, marked the establishment of this remarkable record of "Sunny Jim," accomplished just ten months after his inauguration.

On the last lap of this swing throughout the State which has taken him into every corner, every hamlet, every town and city of the great commonwealth of California, the Governor, accompanied by a number of his official family, visited Crescent City, Eureka, Ukiah, and Lakeport, on November 16, 17 and 18.

KEPT CAMPAIGN PROMISE

During the primary campaign, the Governor stumped the State from north to south, from east to west. He told his fellow Californians then that, if elected to the lofty office of Chief Executive of the State, he would again visit every community and particularly every county seat. He said the purpose of such visits would be, first, to thank the voters for their faith and confidence in him, and second, to learn first hand the problems faced by each community.

To keep his promise, he arose from a sick bed. For, just a few days before the scheduled last lap of the state-wide tour, his physician was doubtful if the Governor's health would permit the strain of such a journey. But the Governor was adamant. He insisted he must keep his engagements in Del Norte, Mendocino, and Lake counties. And despite cold, rain and sleet, through which he traveled the entire three days of this last lap, the Governor set out.

SPLENDID RECEPTIONS

His receptions everywhere throughout each tour, have been extraordinary demonstrations of popular enthusiasm and appreciation. But those accorded him on this last trip, transcended any previous ones. For the people he visited realized that the Governor was taxing himself to keep his word. And their

response was more than generous. Everywhere he visited, hundreds turned out to greet him. At several of the luncheons and banquets given in his honor, scores were turned away for lack of accommodations, despite the fact that his audiences were forced to travel over wet and slippery roads to greet him.

Many sections of the State visited had never seen a Governor. Hundreds of little one-room school houses have been inspected and the children, sons and daughters of farmers, agriculturists, cattle raisers, and miners, have been addressed by the State's Chief Executive.

And his message to these little ones?

Their obligations to their parents and their teachers.

MESSAGE TO CHILDREN

He told them that California was second to no State in the generous and thorough education being given its young. He admonished them to shun evil companions and to grow up useful citizens. He told them they were living in a matchless age and urged them to take advantage of the opportunities offered them.

To his adult audiences, the Governor took this message:

"Have faith in California."

He outlined the possibilities of the State; he begged for support of an equitable State-wide water plan to the end that all sections of the State might be opened up for the huge population he predicted would come to California if given an adequate water supply.

He told of the efforts of the administration to cope with the unemployment situation and begged that support be given by all citizens to all relief and charity organizations.

He pictured the faith being shown in California by the big shipping interests who today are building a series of huge liners to ply along the pathways of trade and commerce from the ports of this State.

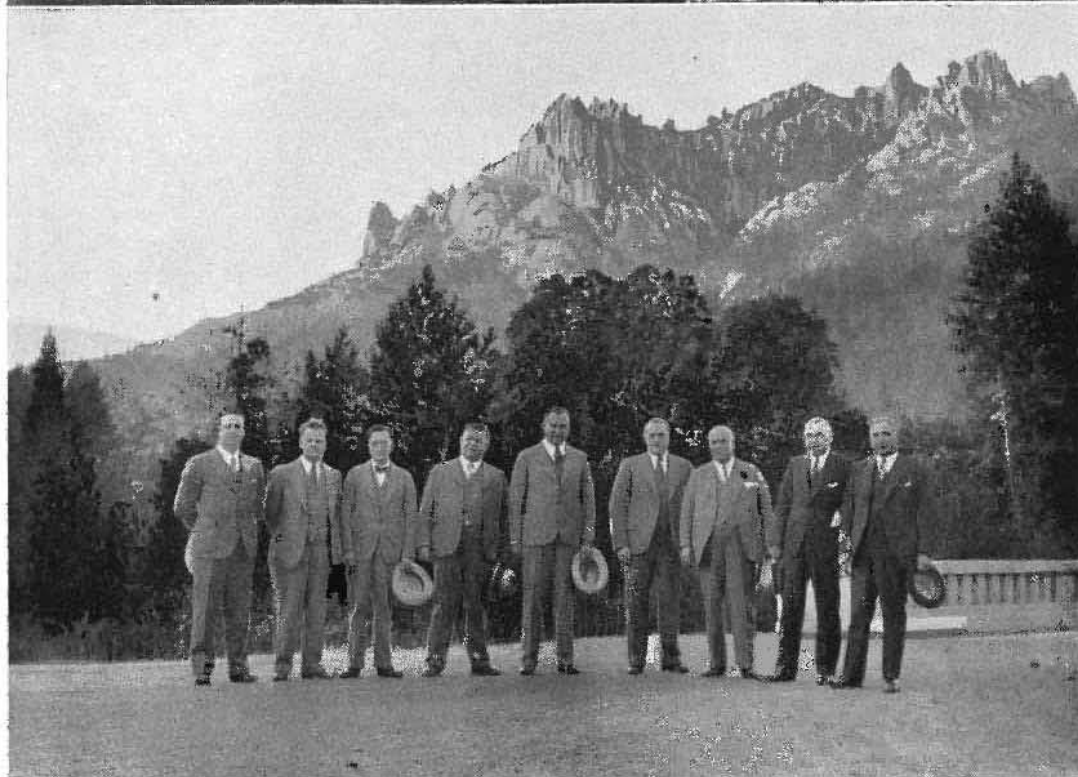
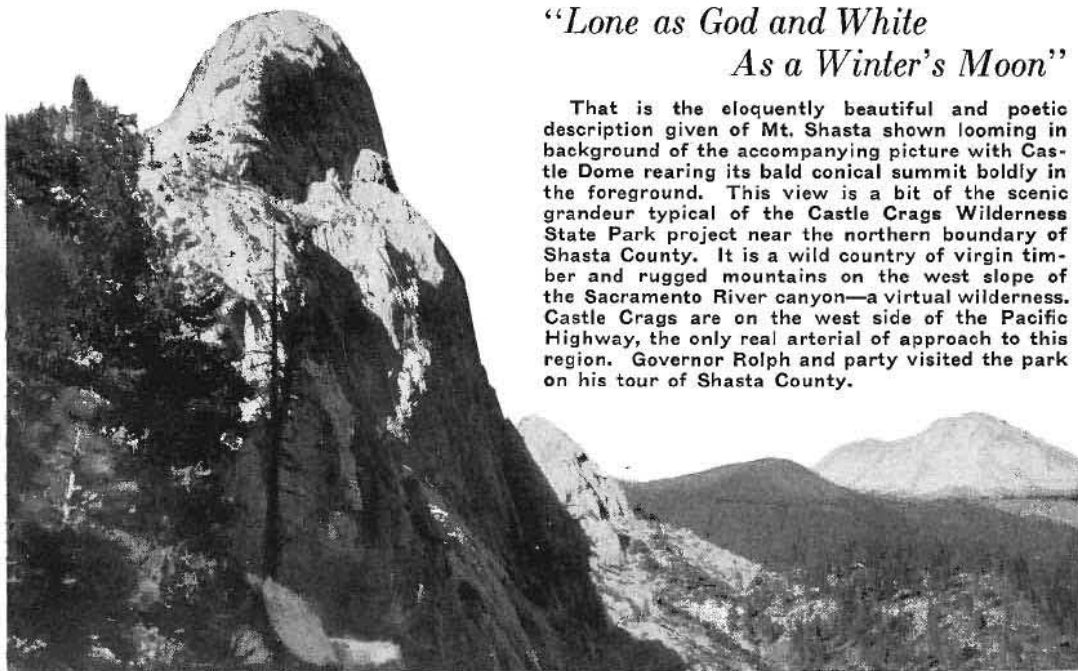
Accompanying the Governor on these trips, have been prominent members of his official family, to discuss with the citizens of various communities the problems relative to each section of the State.

Enthusiastic applause greeted the Governor's speeches, particularly when he said:

(Continued on page 44)

*"Lone as God and White
As a Winter's Moon"*

That is the eloquently beautiful and poetic description given of Mt. Shasta shown looming in background of the accompanying picture with Castle Dome rearing its bald conical summit boldly in the foreground. This view is a bit of the scenic grandeur typical of the Castle Crags Wilderness State Park project near the northern boundary of Shasta County. It is a wild country of virgin timber and rugged mountains on the west slope of the Sacramento River canyon—a virtual wilderness. Castle Crags are on the west side of the Pacific Highway, the only real arterial of approach to this region. Governor Rolph and party visited the park on his tour of Shasta County.



NO HOLLYWOOD STUFF in this picture. It's real scenery as viewed from the Pacific Highway near Castella Portal of the Castle Crags Wilderness State Park project and the picture was taken during Governor Rolph's recent visit to Shasta County. The Governor and his party are standing on the Pacific Highway bridge over Castle Creek. In the party, from left to right, are Russell Bevans, Eric Cullenward, John McColl, Henry J. McGuiness, Earl Lee Kelly, E. Raymond Cato, Governor James Rolph, Jr., Charles H. Purcell and Colonel Walter E. Garrison.

Western State Engineers, Meeting in Sacramento, Pass Important Resolutions

THE Association of Western State Engineers, meeting at the State Capitol in Sacramento with Edward Hyatt, State Engineer of California, presiding, concluded its Fourth Annual Conference on October 30th. It was a meeting featured by record attendance, excellent papers, and lively discussion. Attention, as was to be expected, focused upon water matters and Federal-State relations with respect thereto.

Arizona, California, Colorado, Idaho, Kansas, Nevada, New Mexico, North Dakota, Oregon, Texas, Utah, Washington, Wyoming, the U. S. Geological Survey, the Division of Agricultural Engineering of the U. S. Department of Agriculture, the U. S. Bureau of Reclamation, the U. S. Forest Service, the U. S. Corps of Army Engineers, and the Federal Power Commission were represented officially by one or more delegates and there was a large attendance of visitors throughout each day of the conference.

RESOLUTIONS ADOPTED

The most important business transacted at the conference was the adoption of resolutions which are briefly summarized as follows:

RESOLUTION NO. 1 recommending changes in connection with the United States Weather Bureau with respect to more careful location of precipitation stations, a more accurate check of records prior to publication, an increase in research work, and the employment of more scientific personnel.

RESOLUTION NO. 2 reaffirming the previously announced position of the Association condemning efforts of Federal Bureaus to assert Federal ownership of unappropriated water and to avoid compliance with State laws and decisions of the courts with respect thereto.

RESOLUTION NO. 3 inviting Dr. Elwood Mead, U. S. Commissioner of Reclamation, to attend the next conference of the Association prepared to outline definitely the policy of the Bureau of Reclamation with respect to acquirement, adjudication, and administration of water rights of the bureau.

RESOLUTION NO. 4 requesting the Secretary of the Interior to name a "Director" in place of an "Acting Director" of the U. S. Geological Survey.

CALL FOR RESURVEY

RESOLUTION NO. 5 calling for a resurvey and readjustment of the U. S. Army gaging stations established pursuant to the provisions of House Document 308, 69th Congress, 1st Session; dis-

proving the provision in the appropriation bill of the current year requiring cooperating agencies to pay half the cost of publication of data; urging that henceforth Congress appropriate sufficient moneys to the Geological Survey that it can carry on all required Federal stream gaging and topographic mapping instead of parcelling this work out among various interested Federal agencies, and urging upon Congress that it appropriate sufficient moneys to the Geological Survey to complete a satisfactory base map of the United States in twenty years and that in this work the Survey be authorized to meet offers of cooperation on a fifty-fifty basis subject only to the condition that a reasonable proportion of the whole appropriation be divided equitably among all states having due regard to the unsurveyed areas in each and the importance of the work.

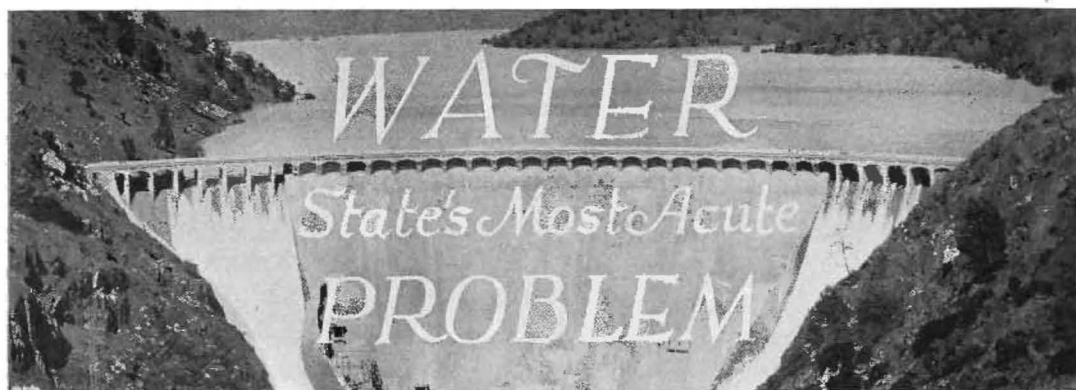
RESOLUTION NO. 6 endorsing the principle expressed in Senate Bill 4123 and H. R. 11718 proposing Federal relief for drainage and irrigation districts, and

RESOLUTION NO. 7 commending the President of the United States and the Congress for their efforts to reach a proper solution of the important question of disposal of public lands and urging upon them the most serious consideration of the report of the Committee on Conservation and Administration of the Public Domain.

OTHER TOPICS DISCUSSED

Members were greeted on the opening day by Lieutenant Governor Frank F. Merriam and Mayor C. H. S. Bidwell of Sacramento and Congressman Phil D. Swing dropped in during the course of the conference to pledge his support to the Association. Discussion of Federal and State policies with respect to water, occupied the attention of the conference.

George M. Bacon, State Engineer of Utah, was elected president succeeding Edward Hyatt, State Engineer of California, and Salt Lake City was selected as the next place of meeting. George S. Knapp, Chief Engineer of the Division of Water Resources of Kansas, was elected vice president succeeding Mr. Bacon, and Mr. Reid Jerman, Principal Assistant State Engineer of Utah, has been named Secretary to succeed Everett N. Bryan, Hydraulic Engineer of the California Division of Water Resources. Edward Hyatt, State Engineer of California, was elected to serve with the president and vice president as third member of the executive committee.



This is the fourth of a series of articles on the State's water problem to be published in *California Highways and Public Works*. The first dealt with Governor Rolph's call for united efforts by the entire State to solve the problem. The second and third articles described the situation confronting the Sacramento Valley, Sacramento-San Joaquin Delta and Los Angeles areas. This article is devoted to San Joaquin Valley conditions and the State water plan for improving them.

THE San Joaquin Valley, commencing at the junction of San Joaquin and Sacramento Rivers, sweeps southward between the Sierra Nevada and Coast Range, a distance of 250 miles to the horseshoe rim of the Tehachapi Mountains at the head of the valley. From 50 to 70 miles in width, the valley is an empire in itself, containing more than one-third of the agricultural lands of the State.

Favorable climatic conditions and fertile soils led to intensive development of many large areas of the valley. Scant rainfall forced the use of irrigation and more than one-third of the lands now under irrigation within the State are in this great valley. As the rainfall and water supply in the Coast Range are small, most of the irrigation development is on the east side, or adjacent to the San Joaquin River on the west side.

Irrigation development has taken a somewhat different course in the northern and southern parts of the valley. In the section northerly from the Chowchilla River near Madera direct diversions from the Sierra streams were used for irrigation until development had become sufficiently extensive to enable storage to be financed.

THREE RESERVOIRS

Reservoirs on three of the large east side tributaries have been constructed to sufficient capacity to insure a dependable water supply throughout the season for the present development. These reservoirs are the Melones Reser-

voir on the Stanislaus River with a capacity of 113,000 acre-feet, serving the Oakdale Irrigation District with a net irrigated area of 21,000 acres and the South San Joaquin Irrigation District with a net irrigated area of 54,300 acres; the Don Pedro Reservoir with a capacity of 290,000 acre-feet serving a net irrigated area of 205,000 acres in the Modesto and Turlock Irrigation Districts; and the Exchequer Reservoir on the Merced River with a capacity of 279,000 acre-feet serving a net irrigated area of 125,000 acres in the Merced Irrigation District.

In the southerly part or Upper San Joaquin Valley, ground water as well as surface supplies have been used. Originally artesian flows were found in many localities. Large areas have been developed through pumping from wells, and in many cases where the surface supply is small or uncertain it is supplemented by pumping during the latter part of the season.

Of the 1,200,000 acres now under irrigation in the Upper San Joaquin Valley, about one-third is served from surface supplies, one-third from streams and wells and one-third entirely from wells. In this area no mountain water storage has been developed for irrigation purposes alone. On the San Joaquin River, storage for power regulates some water for irrigation. Smaller amounts of power installation with little or no regulatory storage have been developed on the Kern and Kaweah rivers.

Buena Vista Lake in the trough of the valley stores flood waters of the Kern River for

75,000 Square Miles to be Mapped Costing \$1,660,000 and 14 Years Work

By **EVERETT N. BRYAN**, Hydraulic Engineer, Division of Water Resources

A DEFINITE program of topographic mapping in California has been agreed upon by the district office of the U. S. Geological Survey and the State Engineer's office having as its object the completion of a reasonable satisfactory topographic base map of the State of California.

The Federal government, through the local office of the U. S. Geological Survey, and the State of California, through the office of State Engineer, are carrying on this work on a dollar for dollar cooperative basis and the program arranged is the culmination of some five months effort beginning with a conference on May 8, 1931, to which all major agencies concerned with the production and use of these maps were invited to send representatives.

The U. S. Geological Survey, the State Engineer's office, the State Division of Highways, the Corps of Engineers U. S. Army, the California Forest Experiment Station, the California Economic Research Council, the State Division of Mines, the U. S. Forest Service and the College of Agriculture of the University of California were all represented by personal appearance at this conference and several other agencies made appearance by letter.

75,000 SQUARE MILES

The program arranged provides for the mapping of all previously unmapped areas, the remapping of all areas for which there are presently available only the U. S. Army tactical maps, the resurvey of all areas for which there are presently available only U. S. Geological Survey topographic maps of a scale of 1:250,000 surveyed prior to 1890, the completion of surveys made by the city of Los Angeles in San Bernardino, Riverside and Imperial counties, the resurvey of certain mining, recreational and forested areas in the northern Sierra done some 40 years ago, and the resurvey of highly developed areas in western San Bernardino and Riverside counties and

in San Diego County wherein there have been many cultural changes and there are presently available only small scale maps done 30 to 35 years ago. **Completion of the program involves the mapping of some 75,000 square miles or 47 per cent of the area of the State and it is estimated will cost \$1,660,000. On the basis of expenditures proposed during the current year it will require fourteen years, or until 1945, to complete the program.**

AREAS SCHEDULED

The more important general areas which are scheduled for mapping proceeding from north to south include the following:

1. The north coastal area for which there are now available only the U. S. Army tactical maps, which are wholly inadequate for general purposes.
2. The extreme northern and northeastern portions of California for which there are now available only the old U. S. Geological survey quadrangle sheets of a scale 1:250,000 done prior to 1890.
3. Previously unsurveyed or only partially surveyed areas in the Clear Lake to Redding Coast Range section, for which there are now no published maps available.
4. Recreational, mining and forested areas in the northern Sierra from Quincy south to Yosemite, for which there are presently available only U. S. Geological Survey Quadrangles done some 35 to 47 years ago.
5. Unmapped areas on southern San Joaquin Valley floor.
6. Areas in San Bernardino, Riverside, Orange and Imperial counties, for which there are now either no published maps or only those done 30 to 35 years ago.



Everett N. Bryan

Arrangement of the program required a determination of two very important factors—the scales which should be used and the order in which the work should be undertaken. While it was readily agreed that no new work should be done on the scale 1:250,000 (*i.e.*, 4 miles to the inch) there was considerable room for choice between the larger scales and an earnest desire was manifested among the various users of the maps for large scale work.

There is, however, a very rapid increase in cost with an increase in scale and if the pro-

(Continued on page 18)

Slip of Pen Might Cost Him \$30,000 Yet Gunston Smiles

ALMOST any day of the week, George T. Gunston, disbursing officer of the Department of Public Works and assistant secretary of the California Highway Commission, can put his hand in a drawer of his desk and pull out a million dollars or so. On a recent Wednesday, bid opening day, he could exhibit \$2,500,000.

But while it's all perfectly good money, it's not cash or even currency—just contractors' checks deposited as guarantees with their bids. The total of them runs high on an afternoon when bids on a number of jobs are opened. Last week for instance the bidders on one job alone had up \$581,000. All of this paper is returned within twenty-four hours except the check of the lowest or successful bidder who gets his back when he furnishes a satisfactory bond upon the execution of the contract.

SIGNS 10,000 CHECKS

As disbursing officer Mr. Gunston sends out about 10,000 checks a month in payment of all types of departmental bills, disbursing approximately \$3,000,000 a month for highways alone. By the use of a multiple pen-holding mechanism he can sign five checks at a time. Figure out how long it takes him.

He has some queer experiences with contractors. One forgetful lowest bidder put his check in his pocket instead of in the bid envelope and of course lost the contract. Another was one cent short of the required amount and was ruled out. Another with \$35,000 up in securities was \$5 short on a job approximating \$350,000 and lost it.

CAPTAIN OF ARTILLERY

Handling all this paper representing the State's and other people's money is a ticklish job because Gunston is responsible for any mistake and a mistake might mean a trifle or thirty or forty thousand dollars, yet he sleeps o' nights and smiles.

For Gunston, a soldier, is endowed with the necessary courage for such a job. He served with the Washington National Guard during the war and is commander of Battery D, 143d Field Artillery, California National Guard of Sacramento, equipped with four 75 millimeter guns, manned by four officers and 66 men.



THERE'S MILLIONS IN IT, speaking of the big black safe, but not a dollar you can spend—all in the custody of George T. Gunston, disbursing officer of the Department of Public Works. He has handled as high as \$2,000,000 a day but all of it in bidder's guarantee checks, not a cent in cash or even currency.

31 States Changing License Plate Hues

Thirty-one states will change the color combination for automobile license plates in 1932, and 23 different motifs will be used throughout the country, indicating that almost every hue will be represented in next year's parade, according to a survey by the American Automobile Association.

The national motoring body pointed out that 13 states and the District of Columbia will retain the 1931 colors, reversing them as to background and lettering, indicating a trend back toward standardization of colors. California, in this group, will revert to black on orange.

Tons of Explosive Used to Stop Sinking of Alto-Waldo Road Fill

By J. H. SKEGGS, District Engineer

ONE of the most important links of the Redwood Highway constructed to date is the Alto-Waldo unit officially opened to the public November 22.

This section of road, although only 2.45 miles in length from northerly limits at Alto to southerly limits at Waldo called for the solution of many extremely original engineering and construction problems including the dynamiting of a fill to stop continued subsidence.

The project involved a bridge structure across Richardson Bay and fills across an arm of the bay between De Silva Island and the mainland north of the bridge.

The maintenance of fills constructed through marsh and tidelands has been a source of trouble and expense to the railroads for years. However, it is even more serious and baffling as a highway problem.

DROPS INTO MUD

Fills across marshes are usually sunk as far into the mud as the heavy equipment with which they are constructed will sink them. During construction they are brought to grade many times, only to have huge slices or sections to the fill shear off and drop several feet into the mud, displacing it and causing an upheaval on the sides. Finally a state of apparent floating stability is reached, but on opening the fill to the pounding of heavy traffic it commences a slow subsidence of only a few inches per year but steady and relentless over a long period of time. The railroads brought their tracks to grade by adding ballast but the remedy for a highway is not so simple.

The settlement of a fill is never exactly uniform. This in itself tends, by removing the support underneath and distorting the mass, to disintegrate the wearing surface.

It causes depressions which, even if slight, prevent surface drainage due to the wide roadway and the light crown allowable. These depressions cause puddles and splashing during wet weather and tend to further disintegrate the surface by water seeping through.

Until the subsidence has continued over a period of several years, and the road has

been repeatedly patched and smoothed up, it is not advisable to invest in a permanent or heavy type of pavement.

On this project across the arm of the bay, between De Silva Island and the mainland, the mud was sounded to a depth of fifty feet prior to construction.

During construction with the usual methods the mud was heaved several hundred feet outward on either side of the road grade and it was apparent that the problem of subsidence was to be particularly acute.

Although highway problems in the marshes of New Jersey were hardly comparable to those of California, due to the large percentage of vegetative matter composing the eastern marshes, it was considered advisable to bring to California Mr. J. A. Williams, District Construction Engineer of the New Jersey Highway Commission, for the purpose of consulting on blasting methods of sinking fills successfully used in New Jersey.

TONS OF EXPLOSIVE

The New Jersey methods had to be altered considerably to fit local conditions, but the results desired were the same.

Tons of 60 per cent nitroglycerin gelatin were used in blasting the mud from beneath the heavier fill material, settling it after several blasts to the hard bottom beneath. The fill was sounded after each blast to determine the effect of the shot.

The full value of this experiment will not be known until all the data has been compiled and analyzed, which includes the sounding of displaced material on the sides as well as that within the roadway section.

It is definitely known that a fill can be forced down to bottom even with the great depth of mud here encountered. It is hoped to determine from the massive data obtained on this project just what is the maximum depth to which a fill can be economically forced to produce final stability.

It is known that a portion of the roadway material was displaced with the mud and lost for roadway purposes. The amount of this should be determined from analysis of side borings. Portions of other fills on this project were partially sunk, but were not



SLOUGH OF DESPOND, this was for the engineers until they got mad and dynamited the fill that wouldn't fill on the newly-opened Alto-Waldo link of the Redwood Empire highway across an arm of Richardson Bay. Note the cracks showing the settling despite repeated dumping of hundreds of tons of road material. Tons of explosive finally blasted the way to hard bottom.

forced clear to the hard bottom in an effort to find a point of balance or stability without the extreme measures resorted to.

The public in riding this short section of highway can hardly be expected to realize the difficulties of its construction, the invisible forces of nature which had to be overcome. They can, however, enjoy the smooth wide surface, the picturesque bridge and the saving in time due to decreased distance, increased width, improved alignment and inherent safety features.

They should particularly appreciate the "braided crossing" at the southerly end of the bridge which will sort out with perfect safety 20 per cent of the traffic bound for Mill Valley and adjacent vicinity without any slackening in speed of that 20 per cent or the other 80 per cent speeding northward along the main highway.

This Alto-Waldo link receives and delivers traffic at the door of Sausalito. It saves in itself 1½ miles distance over the existing route between these limits, but together with the San Rafael to Alto cutoff opened last

year saves 30 per cent of the distance or approximately 4 miles over the previous highway between Sausalito and San Rafael.

It reduces the curvature over 90 per cent between the two cities, providing alignment comparable to the best railroad alignment of the country, and embodies in basic engineering design the ultimate in safety features.

GOT THE DECISION

A farmer west of town had been using his tractor to pull mired motorists out of a mudhole at \$1 per jerk. More money in it than farming. A city drayman looked on with envious eyes and started competition. The tractor was the best mudhorse and got most of the business.

The drayman telephoned the county attorney, and asked if a man could operate a tractor on the public highway without a license. The county attorney looked up the law and found that "Tractors used for road work other than hauling material shall be exempt."—*Minnesota Highway News*.

He—That driver ahead must be Miss Fiditch, my old school teacher.

She—Why?

He—She seems to be so reluctant about letting me pass.—*Motor Land*.

Pay Roll Dollar Reaches 42,000 Men

(Continued from page 1)

Within the last ten months, the Highway Commission has passed \$500,000 in direct aid to localities in the State, meaning that in each instance the sum has been more than matched by local enterprises and reflected back in the labor employing agencies.

OUT OF SAVINGS

In the progress of the year's work the Department saved \$1,500,000 out of its maintenance budget, due to falling prices of material and favorable work conditions. This sum was made immediately available for extra maintenance work on the highways.

During the month of October, 3600 married men were given employment on a part-time basis over a period of five months. These were in addition to the maximum on regular pay rolls. The personnel was selected by the mayors and American Legion officials from localities in the vicinity of the work to be done.

The pay roll of the Highway Division, all inclusive of its activities, now carries 14,000 employees. The pay rolls of contractors in the division carry about 12,000 more men. Going deeper into the inquiry, \$18,000,000 reaching the counties is estimated to have added directly about 7000 more men to the local pay roll, but the full results of the stimulus to county enterprise is reflected far beyond the actual personnel of the pay rolls.

Material men, transportation companies and technical labor have been drawn on heavily through this activity.

The \$48,000,000 schedule of the Department of Public Works, plus the \$18,000,000 fund going to the counties, means that under the accelerated program something like \$66,000,000 has been set in motion against the unemployment situation this year. Represented in this is something like \$10,000,000 of special appropriations made by the Legislature in extension of going building construction program.

There may have been larger amounts open for expenditure in the employment of labor, but it is doubtful that any have touched the taxpayer more lightly. Every phase of construction, building or maintenance, is on a pay-as-you-go plan. No bonds have been issued or any additional taxes imposed.

Back of this is the 3-cent gasoline tax and its auxiliary license money, which, for the last

WISCONSIN THANKS CALIFORNIA

Executives of the Department of Public Works are occasionally called upon by officials of other states for information concerning California methods and practices. Recently Chairman Thomas J. Pattison of the Wisconsin Highway Commission called on Adolph N. Sutro, District Right of Way agent at Los Angeles, and sends his thanks for the assistance given him in the following letter from the state capitol at Madison, Wisconsin:

Mr. Adolph N. Sutro
1111 Associated Realty Building
Los Angeles

My dear Mr. Sutro:

I wish to express my appreciation to you for the many valuable suggestions I received from you and from the members of the State Highway Department in Division No. 7, where I obtained a great deal of information which will be of value in the Highway Department of the State of Wisconsin, more particularly with reference to your plan of acquiring right of way. I have discussed your system with our Commission, and we are very much impressed and believe that we can follow your plan of acquiring right of way and save the State of Wisconsin a great deal of money. * * * This question of acquiring right of way in Wisconsin has for some time been a serious problem, and I believe that this plan will very materially reduce our costs of right of way.

I wish to thank you for the very fine consideration you gave me while at your office, and to say that I will be very glad to hear from you at any time.

Very truly yours,

WISCONSIN HIGHWAY COMMISSION
By Thos. J. Pattison, Chairman

biennium, netted the State \$64,000,000, and the counties \$31,000,000. This vast fund is apportioned by statute and goes directly to the disbursing agents of the Highway Department and to the counties.

The prompt distribution of these funds was made possible through adjustments and elimination of red-tape delays, thus meeting the Governor's insistence that the maximum amount of employment be provided at the earliest practical date.

It is accepted as a fact that of the millions of dollars being spent by California, fully 85 per cent ultimately reaches a labor pay roll.

Figures that Tell the Facts

The object of this tabulation is to show at a glance the far reaching distribution of State funds disbursed by the Department of Public Works. The total of employees or ultimate recipients of these funds as shown here is based on (1) department pay rolls, (2) contractors' pay rolls, (3) county construction and pay rolls aided by gas tax revenue, (4) joint highway district work aided by gas tax, and, (5) materialmen's pay rolls increased from like source. This total is not a pay roll count of individuals but a computation, in part, based on an accepted formula.

DEPARTMENT OF PUBLIC WORKS EMPLOYMENT RECORD FOR 1931

Public Works Department employees.....	14,000
State highway contractors' employees.....	12,000
County highway contractors' employees.....	7,000
County maintenance employees.....	4,000
Joint highway district enterprises.....	1,500
Special aid allocations.....	700
Materialmen's requirements.....	1,200
Building construction contracts.....	2,000
	42,400

1931-32 BIENNIUM PAY ROLL RESOURCES

Gas and subsidiary tax, biennium July 1, 1929-June 30, 1931.....	\$54,945,509	69
Federal aid allotments paid on completed projects.....	8,425,625	54
Revenues from cooperative projects.....	747,808	05
Gas and subsidiary tax paid to counties.....	31,844,342	42
Total.....	\$95,963,285	70
Special legislative appropriation.....	10,000,000	00
Grand total.....	\$105,963,285	70

Whole "Family" Invited to Xmas Party

THE "one big family" sentiment so marked at every gathering of Department of Public Works employees under the present administration has developed into plans for a big "Family Christmas Party" on December 23d at which Governor James Rolph, Jr., will be guest of honor and all employees of the Department are invited to be the guests of Colonel Walter E. Garrison, director, James I. Herz, deputy director, and executive heads of the department.

The party will be staged at the Elks Temple, Sacramento, and the merry Yuletide festivities will begin with a huge Christmas tree and entertainment for the kiddies in the afternoon at which Santa Claus will be present, of

course, and distribute presents, candy and ice cream to all the youngsters.

Then when the children have been taken home and snugly tucked into bed with visions of sugar plums, etc., the mothers and dads will return to the hall for the big dance that will last until the wee small hours with a lot of favors and merriment characteristic of Yuletide.

The big Christmas tree and piny decorations gathered from snow covered mountains will be provided by the maintenance crew of District Ten at Donner Summit.

It is pointed out that the efficiency of motor car engines has increased forty five per cent in five years. And the efficiency of drivers, how much?

Joint Hearings by State Water Bodies in South Evidence Keen Public Interest

E

Joint Legislative Water Resources Committee, presided. Officials of San Diego County irrigation districts outlined some of their difficulties and stressed the need of further conservation of local waters. State assistance was requested in modifying the present riparian laws of the State, in order to allow proper conservation of the State's waters. The necessity of importing additional water from the Colorado River to meet the ultimate needs was brought out by city authorities.



GOVERNOR ROLPH'S COMMISSION officially titled the California Water Resources Commission as it appeared at a joint hearing in southern California with the legislative committee, is shown in this photograph. The members are: (front row, left to right) A. B. Tarpey, Vice Chairman Shannon Crandall, Chairman Matt I. Sullivan, James M. Burke, W. B. Matthews. In the rear row (left to right) are Jesse Poundstone, R. C. Harbison, Francis Carr, Major A. M. Barton, State Engineer Edward Hyatt, Jr.

hear from the citizens of the southern part of the State regarding their local problems of water shortage and their recommendations as to how proper conservation may be accomplished.

On November 2d at a joint session in San Diego, representative citizens of the city of San Diego and San Diego County presented the conservation and flood control problems of the city and county, particularly of the San Diego River and Mission Bay. Senator B. S. Crittenden, chairman of the California

PROBLEMS DISCUSSED

Assemblyman George B. Bowers made a short introductory talk and introduced the San Diego representatives. Tom Allen, Charles Hoopes, Colonel Ed Fletcher, Assemblyman Ed L. Head, B. D. Phelps, C. L. Myers, H. N. Savage, Hal G. Hotchkiss and Senator William E. Harper were among the speakers who discussed the San Diego River problems.

At the afternoon session, Mayor Austin assured the full cooperation of the city of



JOINT LEGISLATIVE COMMITTEE members who participated in water hearings in the south are shown above. In the front row, from left to right, are Assemblyman Edward Craig; Assemblyman Chester M. Kline; Senator B. S. Crittenden, chairman; Assemblyman Harold C. Cloudman; Assemblyman Robert L. Patterson. In the back row, left to right are Senator C. C. Baker; Senator Frank W. Mixer; Assemblyman Robert P. Easley; Joe Nolan, sergeant at arms; Assemblyman Frank S. Israel; Senator Andrew P. Schottky.

San Diego in working out a conservation program. Warren Lee Pierson, V. B. Westfall, A. H. Anthony of the Fallbrook Irrigation District and Thomas H. King, Consulting Engineer of San Diego, discussed the irrigation problems of this territory.

Following the joint meeting, an inspection trip was made through the San Diego River basin, visiting El Capitan and several other dam sites.

On the following morning, the Fallbrook Irrigation District was visited and the water shortage of this area was evidenced by the retrogression of highly developed orchards. The question of water rights has prevented conservation of flood waters and development of a proper water supply for this valuable section.

Proceeding to Riverside the second meeting in southern California was held to hear from the people of Riverside, San Bernardino, Orange and Imperial counties. Nearly one hundred citizens and officials of local organizations showed their interest by their attendance.

RIVERSIDE MEETING

The representatives from the different counties explained their viewpoint on the State Water Plan. Local problems in the Santa Ana River Basin, the Mojave River Basin, the Imperial Valley and the San Jacinto area

were outlined and discussed. Assemblyman Chester M. Kline, member of the Joint Legislative Water Committee presided.

William Jerome, O. T. Stephens and Ross Shafer spoke on the viewpoint and problems of Orange County. J. P. Hoffman of Mojave Valley, J. W. Sallee of Jacinto, Francis Cuttle of Riverside, Charles C. Childers of Imperial Valley, Mayor Joseph S. Long, Dr. Horace Porter, former Mayor of Riverside, Assemblyman A. E. Brock, J. J. Prendergast and H. H. Hale discussed the various phases of the problem.

James M. Burke and Francis Carr of the Governor's Commission, Senator Crittenden, and Assemblyman Robert P. Easley of the Joint Legislative Water Committee outlined the work of the Commission and Committee and of the necessity for developing a plan of conservation state-wide in its scope, that will be fair to all sections.

STATE PLAN OUTLINED

At the close of the meeting the official party went to Monrovia to attend a dinner meeting as guests of the Associated Chambers of Commerce of the San Gabriel Valley. Twenty-two municipalities of this valley were represented at the meeting. State Engineer Hyatt outlined the State Water Plan as recommended by the Department of Public Works and discussed the nature and costs of the units of the

(Continued on page 26)

Three Counties Join in Dedication Of New Sutter Basin Highway

GOVERNOR JAMES ROLPH, JR., journeyed from Sacramento to Robbins on Saturday morning, October 24, and formally opened the new Sutter Basin highway that brings the east and west sides of the valley in closer contact, links the Robbins district with Yuba City and Marysville and affords an all-year road between those cities and Woodland.

The section of road recently completed is a portion of a joint highway project from Robbins to Tudor in which Sutter and Yolo counties share the cost with the State.

A crowd of some three thousand enthusiastic citizens greeted the Governor, including official and civic representatives from Sutter, Yolo and Yuba counties. A caravan of seventy cars brought 350 residents of Woodland headed by Mayor H. I. Bobb, Fred Shaffer, Secretary-Manager of the Chamber of Commerce, and city and county officials.

ADDRESS BY GOVERNOR

Following a luncheon attended by the gubernatorial party and notables of the three counties, Governor Rolph addressed the assemblage telling them of the great pleasure the occasion afforded him and reciting the history and progress of the joint highway project that was started by Yolo and Sutter counties in 1929.

Other speakers were William O. Russell, chairman of the Yolo County Board of Supervisors; Arthur C. Huston, Sr., Woodland; A. A. McMullen, Yuba City Publisher; ex-Assemblyman Fred Noyes of Sutter County; Supervisor Frank B. Edson of Yolo County; Supervisor Frank H. Graves of Sutter County, chairman of the joint highway commission; W. T. Ellis, chairman of the Yuba County Board of Supervisors, and others.

At the conclusion of the speech making Governor Rolph left the platform and advancing to the center of the new highway severed the barrier ribbon, thus figuratively dedicating and opening the highway to traffic.

FREE BARBECUE

A free barbecue for which 1000 pounds of choice beef and 400 dozen rolls were supplied,

aces in the community plunge and a football game added to the festivities attending the dedication.

The initial section of the road recently completed is that portion of the joint highway project from Robbins to Tudor, about ten miles. The improvement consists of grading to a proper roadway width and surfacing same with six inches of asphalt concrete surface on a crushed rock base when new construction is done or a comparable standard where widening is made. The total cost of the recent improvement is \$284,900.

COST DIVIDED

Of this amount, the State furnished \$100,000 and Sutter and Yolo counties the balance. Inasmuch as the assessments against the counties are spread over a period of five years, it was necessary for Sutter County to underwrite portions of the cost not borne by the State, until further county payments accrue.

With the completion of the present improvement, there is a continuous highway connecting the west side highway at Woodland with the east side highway at Yuba City. This shortens the present highway between the cities by about twenty miles. It furnishes easy communication between Yolo and Sutter counties. Over it will be accommodated a large volume of commercial traffic carrying products from a rich agricultural district. It was essential for the development of a school system throughout the year.

NEW BRIDGE NEEDED

For future work, there will be necessary some realignment between Robbins and Knights Landing. Widening of pavement between those points will also be advisable as traffic increases. When funds become available and authority can be secured from the War Department, a new bridge across the Sacramento River at Knights Landing will be advisable. The present roadway crosses the river on a bridge owned by the Southern Pacific.

The use of this bridge for highway purposes is under license that may be revoked. The bridge is narrow and inadequate.



A GREAT DAY it was for Robbins, Sutter County, when the newly completed link of the Sutter Basin highway was officially opened and dedicated at that town by Governor Rolph. A fine spirit of cooperation was shown by all the people of the Sutter Basin section in making the event a memorable occasion. Representative citizens from all parts of Yolo, Sutter and Yuba counties gathered in large numbers to greet Governor Rolph and enjoy a most interesting program that lasted throughout the day. These events included a free barbecue prepared for 2000 visitors, swimming races in the community pool and a football game, following the official luncheon tendered the Governor and his party. The upper picture shows the crowd that pressed around the speaker's stand being addressed by Governor Rolph whose figure is indicated by the arrow mark. Seated on the stand are the Supervisors from Yolo, Sutter and Yuba counties and other officials and notables on the list of speakers. The lower picture shows the Governor cutting the ribbon stretched across the highway, thus officially opening the new road link to traffic. Assisting in this ceremony are State Senator W. P. Rich of Marysville on the right of the Governor and on the left, County Supervisor E. E. Reeves of Yuba City.



Work Divided Between North and South

(Continued from page 8)

gram of mapping was to be completed in reasonable time with the funds which would probably be made available it was necessary to make some sacrifice on this point. In this connection the following comparative estimates of cost are of interest:

Field scale	Published scale	Cost per sq. mile
1:192,000	1:250,000 (4 mi. to 1 inch)	\$10 to \$15
1:96,000	1:125,000 (2 mi. to 1 inch)	\$15 to \$25
1:48,000	1:62,500 (1 mi. to 1 inch)	\$40 to \$60
1:31,680	1:31,680 (½ mi. to 1 inch)	\$50 to \$80

While the scales agreed upon in a few cases are not as large as desired by some of the users it will be noted that fourteen years are required to complete the program even with the smaller scales adopted.

DIVISION OF WORK

In the matter of order of mapping there was also some difficulty in arriving at a schedule which would be generally satisfactory. Each area and interest, impressed with the seriousness of its own need, would, if given its choice, place its own work first. It is manifestly unfair and impracticable, however, to confine all work for a great length of time to one section of the State.

In order to secure maximum efficiency in field work it is necessary to divide the work fairly equally between the northern and southern portions of the State, confining the winter work to southern California. It has appeared equitable and proper also to distribute the annual expenditures among the various interests such as agriculture, mining, forestry, recreation, etc. In the program of mapping agreed upon, therefore, the schedule of annual expenditures is divided fairly equally between the various geographical areas and interests.

The possibilities of expediting completion of this program by adoption of aerial methods in place of the ordinary ground surveys will not be overlooked. An area which will afford a reasonable test both in the matter of cover and slope has been selected in the vicinity of Clear Lake and it is expected that within the next few months aerial mapping will be given a test by which it will be possible to compare the new method with the old in matter of both cost and accuracy.

REVISION EXPERIMENT

Another experiment which will be tried as soon as weather conditions will permit and the work can be organized is that in connection with a cultural revision of some of the older quadrangles. In the vicinity of Lake Tahoe where there has been a very marked recreational development in recent years the only topographic sheets available are those surveyed more than 40 years ago. These are published on the 1:125,000 scale and it is believed the topography is sufficiently accurate that they can be made to serve present purposes reasonably well if the culture is revised to show the new roads, trails, settlements, etc. The Truckee sheet has been selected for this test and it is hoped to work out some method by which all adjoining sheets may be redone at reasonable cost.

In San Bernardino, Riverside and Imperial counties some 15,000 square miles have in recent years been surveyed by the city of Los Angeles in connection with its investigation of the Colorado River project. These surveys have not been published but blue print maps thereof are available on a scale of 1:125,000, lacking, however, the land lines and some of the other detail of the U. S. G. S. topographic sheets. It is expected to complete these surveys and publish the maps.

Experimentation will start within the year on the Hinkley quadrangle in the vicinity of Barstow in an effort to work out the best method and determine the cost.

As a necessary preliminary to proposed topographic mapping datum points must be established for elevation and for position. These datum points are permanent marks of which a list and descriptions may be obtained from the Geological Survey and they therefore are invaluable to California engineers. Local surveys for highways, canals, dams and reservoir sites and all other engineering projects can be referred to these permanent marks thus making each such survey in the State a part of an homogeneous whole.

The flapper, in a heavy sport roadster, came to a screaming stop in front of the traffic officer on a busy street. Said she:

"What's the big idea, flat foot, of no lights here?"

Officer (annoyed): "I'm the light on this corner, lady."

Flapper: "Then turn green so I can cross!"—

Mississippi Highways.

Sierra County Sees Good Significance in Governor's Visit

(Editorial in Downieville Messenger)

THE GOVERNOR'S visit to Downieville was the most important thing that has happened in Sierra County for many years. Its significance may not be fully comprehended by some, but to those in close touch with the situation it is of tremendous importance.

In the Governor's party were men who can do us the greatest amount of good; men like Col. Walter E. Garrison, Director of Public Works, and C. H. Purcell, State Highway Engineer and Chief of Division. These men and the Governor himself listened attentively to what was said by the speakers for Sierra County, who told of the county's needs. They not only listened, but they saw for themselves and gained a close-up, first-hand knowledge of conditions in this county.

They drove over our crooked roads, and agreed that they sorely needed fixing. They were told of how one of our supervisors is compelled to go through three counties and travel a distance of more than 70 miles to attend board meetings at the county seat, a distance of about 20 miles across the mountains. They were told how easy and inexpensive it would be to keep Yuba Pass open in the winter time, the most logical route across the mountains to Reno.

They were told that it would be wholly practical to solve the water problem, cure the financial depression in this State and allow the resumption of hydraulic mining at one and the same time by the building of restraining dams, thereby holding back the flood waters to be used when needed.

That the Governor and his party were impressed with what they heard and saw there is no doubt. There is little doubt, also, but that they will lend their friendly efforts in helping Sierra County with its problems. The Governor did not come here to win votes; the election is past. He came here prompted by a genuine desire to acquaint himself with the actual needs of the county, and to help us in any way he can.

"Freddie," said teacher, "give me a sentence using the word 'dadem'."

Freddie had overheard certain remarks at home, and out of his subconscious store of worldly wisdom he drew this reply:

"People who hurry across railroad crossings dadem sight quicker than people who stop, look and listen."
—*The Earth Mover.*

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official journal of the Division of Highways of the Department of Public Works, State of California; published for the information of the members of the department and the citizens of California.

Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

COLONEL WALTER E. GARRISON.....Director
JOHN W. HOWE.....Editor

Address communications to California Highways and Public Works, P. O. Box 1163, Sacramento, California.

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CALIFORNIA LEADS

The public today demands pavements "as level as a floor" to permit comfort at driving speeds of 50 to 60 miles per hour. California has recognized this public demand and is now building them almost "as level as a floor," although each year sees improvements in surface smoothness.

Upon the completion of each project, its roughness is measured by an instrument called a "vialog." The instrument records the inches of vertical roughness per mile of pavement. The record in 1930 was 4.8 inch per mile and was made on two Portland cement concrete paving jobs, one north of Santa Maria in Santa Barbara County, and the other at Liberty Grade in Los Angeles County.

A roughness of 4.8 inch per mile of pavement is an average roughness of only one-fourth inch every 275 feet. That it is almost "as smooth as a floor" can be realized by comparing this with smoothness specifications. Most highway specifications require that the pavement shall be so smooth that it will not show a variation of over one-quarter inch on a 10-foot straightedge; yet they build them so smooth in California that there is only an equivalent roughness of one-quarter inch in 275 feet.

The season record for placing pavements was made on the Balboa Avenue-Torrey Pines Road in San Diego County. They placed a daily average of 935 feet of standard Portland cement concrete pavement during the time it took them to build the project. The average production per day for all Portland cement concrete paving jobs in the State was 698 feet.—*Roads and Streets.*

Pauline: Oh, look at the poor old man all bent over with rheumatism.

Paul: Rheumatism, my eye! It's Jack coming back from a ride in a rumble seat.—*Our Sun.*

Study Covers Supply for 40 Years

(Continued from page 7)

use on the lower lands served from this stream. Tulare Lake, a depression south of the ridge across the valley formed by the delta of the Kings River, receives part of the flood flow of that river and flood waters from all streams south to the Kern. Reclamation in Tulare Lake restricts the area of overflow in normal years and the water stored here is used on the adjacent lands.

STORAGE CONSIDERED

Storage for irrigation at or near the edge of the State has been under active consideration for many years on the San Joaquin, Kings and Kern rivers. While the physical conditions are favorable, adjustments of water rights and difficulties in organization have delayed the construction of any of these works. The reduced run-off of recent years has also been a factor in the delay. However without storage, the waters of the streams have been put to a high degree of utilization about ninety per cent of the total run-off of the past fourteen years being used on several of these streams.

In the investigation of the water resources of the State made by the Division of Water Resources, an inventory of all waters of the State has been made, and the water requirements have been estimated in each of the seven basins into which the State has been divided. In the study of the San Joaquin Valley, an Engineering Advisory Board composed of eminent consulting engineers has materially aided in outlining the investigations and advised on all phases of the problems. During the past two years the members of this Committee have been, I. H. Althouse, W. H. Code, B. A. Etcheverry, F. C. Herrmann, H. L. Haehl, R. V. Meikle and G. L. Swendsen.

MOUNTAIN DRAINAGE AREA

The mountainous drainage area of the San Joaquin River Basin contains 18,178 square miles, and contributes 16.8 per cent of the stream flow of California. In determining the water supply of the San Joaquin Basin, a study was made of the forty year period from 1889-1929. This period starts with several wet years, contains both wet and dry cycles including one of the largest and driest cycles of record. The mean seasonal run-offs are estimated to be as follows:

	<i>Acres-foot</i>
40 year mean 1889-1929-----	11,980,000
20 year mean 1909-1929-----	10,160,000
10 year mean 1919-1929-----	8,547,000
5 year mean 1924-1929 ----	8,137,000

The variety of uses of water in California possibly exceeds that of any other State in the Union. The predominant use, however, is that for irrigation, and undoubtedly this use will continue to predominate for many years; therefore it has been used as the basis for estimating the water requirements of this area.

In order to determine the ultimate future water requirements a complete classification of all lands in the San Joaquin Valley floor and adjacent foothills was made. A total area of 8,910,000 acres exclusive of the area in the Sacramento-San Joaquin Delta was examined and classified to determine the suitability of the lands for profitable development under irrigation. Of this gross area,

there is a net irrigable area of 5,704,000 acres that may at some time require a water supply. It is estimated that there were 2,033,000 acres or about one-third of this total net irrigable area, irrigated in 1929.

From a study of the average net use based on data collected for all the developed areas along the eastern side of upper San Joaquin Valley covering the period 1921-1929 and from supporting results in the lower San Joaquin Valley, the water requirements are estimated for the Upper San Joaquin Valley on the basis of an average seasonal allowance of two acre-feet per net acre of irrigable land.

RESULTS OF STUDIES

Similar studies were made for the Lower San Joaquin Valley and foothill areas and a gross allowance determined for all lands which might at some time be irrigated. In estimating the ultimate water requirements, it has been necessary to take into account the marked difference between the upper and lower portions thereof in the adequacy of local tributary streams to meet the ultimate irrigation demand and the availability of underground storage for the utilization of the water supplies. The gross and net allowances and net use per unit of area in the lower San Joaquin Basin vary with the geographic location of the irrigable areas with respect to water supply. These values have been established by studies of requirements in fully developed areas.

Based upon the net irrigable areas and the per acre requirements determined for each portion of the basin, the ultimate seasonal water requirements have been estimated for the San Joaquin River Basin excluding the Sacramento-San Joaquin Delta as follows:

Gross allowance in acre-feet..	13,326,000
Net allowance in acre-feet..	11,720,000
Net use in acre-feet.....	10,952,000

A comparison of the water supply and ultimate requirements show a deficiency in the San Joaquin River Basin.

The local supplies in the lower San Joaquin Valley for areas now under irrigation are generous in amount and dependable in occurrence.

In some portions of the upper San Joaquin, the use of water on present development exceeds the natural replenishment. Many farmers are finding it so costly to obtain an adequate supply of water that farms are being abandoned and are reverting to dry farming or pasture. Some 400,000 acres of highly developed land in this area are drawing from their underground supplies at a rate greater than the supply naturally available to them.

REVERT TO DESERT

Of these 400,000 acres, probably some 200,000 acres will go back to desert condition because there is only half enough water for the total area under cultivation. These 200,000 acres are worth more than \$50,000,000 and yield annually products having a value greater than \$20,000,000, three quarters of which are not in a class of those that are overproduced.

If retrogression is allowed to proceed on these farmed lands its effect will be felt in the urban areas

State Plan for Storage and Distribution

(Continued from preceding page)

in the immediate vicinity and in the large metropolitan areas—Los Angeles and San Francisco. The abandonment of these lands would result in a loss of several millions of dollars in annual returns to business in these metropolitan areas.

To meet this critical situation the State Water Plan proposes the purchase of the so-called "grass land" rights along the San Joaquin River. This water together with the water now wasted in the San Joaquin River after satisfying the demands of crop lands would have been sufficient during the 12 year period 1917-1929 (a cycle of drought) to meet the immediate needs of the 400,000 acres in the Upper San Joaquin requiring a supplemental water supply.

FRIANT RESERVOIR

Storage would be obtained by the construction of Friant Reservoir on the San Joaquin River about 20 miles northeasterly from Fresno. The dam proposed would be 252 feet high, creating a reservoir with a gross capacity of 400,000 acre-feet and a usable capacity of 270,000 acre-feet above elevation 467 feet, the diversion elevation of the San Joaquin River-Kern County Canal.

Distribution would be obtained through the San Joaquin River-Kern County Canal to Kern River with a maximum diversion capacity of 3000 second-feet and the Madera Canal with a maximum capacity of 1500 second-feet.

A small pumping system of 20 second-feet capacity is proposed to serve the Magunden-Edison area in Kern County. Kern River water made available by exchange with San Joaquin River water would be diverted from the East Side Canal.

A conveyance channel connecting the Sacramento and the San Joaquin rivers in the delta and a pumping system from the delta up the San Joaquin River are proposed.

The construction of the Sacramento-San Joaquin Delta cross channel will permit the transference of water from the Sacramento River to the San Joaquin Delta now connected by two channels of inadequate capacity, particularly when exportation of water from the delta to San Joaquin Valley is effected.

PUMPING SYSTEM PLANS

The San Joaquin River pumping system would consist of dams and pumping plants in the San Joaquin River as far upstream as the Merced River and artificially constructed channels from the Merced River to the Mendota Weir. This pumping system would deliver water to lands now being irrigated from the San Joaquin River. The furnishing of a Sacramento supply to these lands and the maintenance of fresh water in the Sacramento-San Joaquin Delta by the Kennett reservoir would permit the storage of San Joaquin River water in the Friant reservoir and its conveyance to the lands of water shortage in the upper San Joaquin Valley.

With the purchase of the so-called "grass land" rights, and by utilizing the surplus waters of the San Joaquin River, sufficient water would be obtained from these sources to meet the needs of the developed areas of deficient water supply at a cost less than that from any other source. By this plan the importation of water from the delta of the Sacramento and San Joaquin rivers would not

be required until there was a demand for additional waters to irrigate new lands.

Construction of the San Joaquin River pumping system, therefore, could be deferred. However, it should be included in the plan as an initial unit for the sake of insurance, because a succession of years drier than has been experienced in the past would result in an available supply less than estimated on the basis of the past eight or twelve years and would necessitate installation of the pumping system.

INITIAL PLAN COST

The capital costs of the physical units of the initial plan proposed for the Upper San Joaquin Valley, exclusive of cost of water rights and general expense, are as follows:

Item	Capital cost
Friant dam, reservoir and power plant...	\$15,500,000
San Joaquin River-Kern County Canal (concrete lined).....	27,300,000
Madera canal (concrete lined).....	2,500,000
Magunden-Edison pumping system....	100,000
San Joaquin River pumping system (construction deferred).....	15,000,000
Sacramento-San Joaquin Delta cross channel (construction deferred).....	4,000,000
Total.....	\$64,400,000

In making provision for proper utilization of imported water, consideration should be given to the method of distributing both the "in season" water falling within the irrigation demand and the excess flows not within the irrigation demand, both in and out of season, for replenishment of ground water storage. It is proposed that the "in season" water falling within the irrigation demand be supplied to the irrigated lands by means of surface conduits and ditches in accord with the demand for irrigation water. The water outside of the irrigation demand would be introduced underground by application on absorptive lands for irrigation in greater quantities than net use requirements; through seepage losses from unlined canals and ditches, both existing and proposed; through absorption in stream beds of natural channels; and by the construction of spreading works or by other artificial means of accelerating percolation.

The water thus introduced underground would be recovered later by pumping. Areas of ground water storage therefore would require wells and pumping plants as under present conditions of development and utilization of the local water supplies. Under the proposed plan, however, the proportion of the mean annual supply which would be obtained by pumping, as well as the average pumping lift would be materially reduced.

The State's investigation has been made by the Department of Public Works, Colonel Walter E. Garrison, Director, under the general direction of State Engineer Edward Hyatt. The investigations have been outlined and supervised by A. D. Edmonston, Deputy State Engineer, and the investigation for the San Joaquin River Basin has been executed under the immediate direction of A. L. Trowbridge and Gerald H. Jones.

Highway District Engineers Thrash Out 21 Questions at Annual Conference

THE annual conference of District Engineers was held in Sacramento November 12th and 13th, all District Engineers and Departmental heads attending.

These conferences are held at least once each year for the purpose of affording the District Engineers and Departmental heads an opportunity for exchanging ideas on pertinent subjects, thus enabling each to profit by the others experience and also to insure uniformity of practice on common problems.

This year's conference was very successful and it is felt that everyone was benefited by the various discussions. Principal Assistant Engineer G. T. McCoy presided at the meeting. Addresses were made by Director of Public Works Col. Walter E. Garrison, State Highway Engineer C. H. Purcell, and Deputy Director James I. Herz, all of whom expressed appreciation of the problems confronting the District Engineers and gave assurance of their full support.

THOROUGH DISCUSSION

Prior to the meeting the various districts were requested to advise the chairman of any subjects they wished to bring up for discussion. From the suggestions received twenty-one subjects were selected, as indicated below, all of which were thoroughly discussed during the two-day session.

Probably the most mutually beneficial discussion was in regard to contractors' claims. In this discussion Mr. Purcell emphasized the necessity of the districts' foreseeing and keeping complete records regarding contractors' claims in advance of submitting the final estimate to headquarters; also of the absolute necessity for the resident engineer to put his instructions in writing on all matters where claims may ensue.

Another important subject which was clarified was the maintenance of detours, about which there had been apparently some misunderstanding and some little variance in practice among the various districts. It was pointed out that the policy was for the State to maintain existing roads which were used for detouring traffic around highway construction, any excess maintenance to be a part of the construction costs, although the maintenance work would be handled by the regular maintenance forces.

CONTRACTORS' OBLIGATION

In cases where traffic is not detoured, but carried through construction, the maintenance is solely the contractor's obligation until such time as the road is taken over for maintenance by the State. In cases where detours are constructed alongside of going work, the special provisions will govern; however, the usual policy will be for the contractor to construct the detour which will then be maintained by State forces, any excess maintenance cost being chargeable to the construction project.

The question of the possibility of exercising closer control of overbreak by writing into the specifications more definite provisions controlling blasting operations was discussed at length, the suggestion being made that much trouble would be averted by prohibiting the use of the coyote method. However, the

discussion did not bring out sufficient evidence to seemingly justify any changes in the specifications at this time, it being conceded that the present specifications with rigid inspection are generally proving very satisfactory.

Where a contractor opens up operations obviously with the intent of producing the maximum amount of overbreak, he should be informed at the start and in writing as to just what he will be paid for. It was the general feeling that regardless of how the specifications were written, there would be cases of unavoidable overbreak which legitimately should be paid for and that the practicability of any tighter specifications covering this feature is very questionable.

TWENTY-ONE TOPICS

In discussing equipment rental it was decided to reduce the present ten-day minimum monthly rental to five days.

The above are only few of the highlights of the two-day discussion, which included the following twenty-one subjects:

1. Earth work—reasonable policy with respect to allowance for overbreak, slides, excavation outside of authorized line. Methods of determining shrinkage and swell, proper design on marsh land, on mud flats.
2. Claims on contracts—discussion relative to nature of claims encountered by this department.
3. Personnel—reclassification, Probst reports, etc.
4. Vacations and sick leave.
5. Detours.
6. Cooperative improvements through towns.
7. Alien and prevailing wage laws.
8. Intersections and connecting roads.
9. Roadside beautification, tree planting, sign removing.
10. Liability of officials because of defects in roads or structures, because of issuance of permits, etc.
11. Service agreements—equipment rentals, moving of right of way encroachments, etc.
12. Materials and research—discussion of studies now being carried on.
13. Equipment Department—discussion of matters of general nature which may come up.
14. Bridge Department—status of work and plans.
15. District coordination in improving secondary roads which traverse more than one district.
16. Cutback asphalt—oilmix—emulsions.
17. Bituminous membrane curing.
18. Rock or oiled shoulders as part of original contract in valley roads.
19. Right of way.
20. Standards and economics of highways as now being constructed as to location, cross section, and surfacing.
21. Revisions in specifications.

The engineers enjoyed the banquet at the Country Club on Thursday evening at which were present Highway Commissioners Harry A. Hopkins, Philip A. Stanton and Frank A. Tetley.



THE BIG TEN of highway field executives—the District Engineers of the California Department of Public Works—are shown above as they gathered at headquarters for an annual conference that lasted two days. Seated in the front row from left to right are: State Highway Engineer C. H. Purcell, their chief, and the following District Engineers: Col. John H. Skeggs, San Francisco; S. V. Cortelyou, Los Angeles; L. H. Gibson, San Luis Obispo; C. H. Whitmore, Sacramento; F. W. Haselwood, Eureka; H. S. Comly, Redding; E. E. Wallace, Fresno; E. Q. Sullivan, San Bernardino; R. E. Pierce, Sacramento; F. G. Somner, Bishop. Standing in the rear row from left to right are: G. R. Winslow, Assistant Construction Engineer; J. G. Standley, Staff Engineer; G. T. McCoy, Principal Assistant Engineer; E. W. Withycomb, Assistant Construction Engineer; C. S. Pope, Construction Engineer; F. J. Grumm, Engineer of Surveys and Plans; F. W. Panhorst, Acting Bridge Engineer; R. M. Gillis, Assistant Construction Engineer; T. E. Stanton, Engineer of Materials and Research; J. H. Obermuller, Assistant Engineer of Surveys and Plans; T. H. Dennis, Maintenance Engineer; R. H. Stalnaker, Equipment Engineer; E. R. Higgins, Comptroller, Public Works Department; W. A. Smith and F. E. Quail, Assistant Maintenance Engineers.

Good Roads Boost Gasoline Totals

A striking proof of what good roads have done toward increasing automobile travel is furnished by the latest figures showing that the annual consumption of gasoline is now four times as much as it was ten years ago.

Motorists in California used 1,335,556,000 gallons of gasoline in 1930 as compared to 1,253,337,000 gallons in 1929.

For the country as a whole there were 15,761,400,000 gallons of gasoline consumed by motorists in 1930 as compared with 13,962,120,000 gallons in 1929, an increase of 5.3 per cent.

New York led the states in gasoline consumption last year with a total of 1,511,997,000 gallons, while California was second with a total consumption of 1,335,556,000 gallons.

The annual consumption of gasoline is four times as much as it was ten years ago, although the number of motor vehicles has increased only two and a half times.

\$1,960,500 Budgeted Work Put Underway

The Division of Highways is maintaining the year's record for getting all budgeted work under way. During the last month, construction and maintenance projects set in motion have a cost total of \$1,960,500. The record for the year now stands:

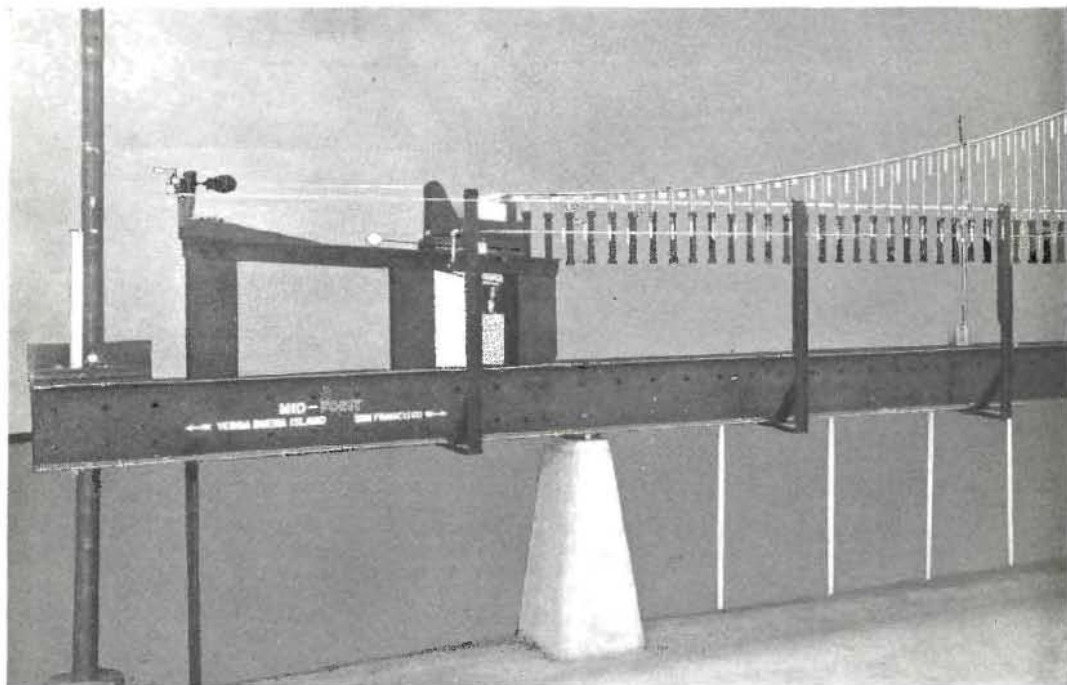
Construction	\$23,355,800
Maintenance	6,460,800
Carried over from 1930.....	9,402,600

Total Jan. 1, 1931, to Nov.
20, 1931.....\$39,219,200

Since October 23, work orders have been issued to a total of \$1,960,500. Projects advertised amount of \$1,333,600. During the coming month, the program calls for the advertising of construction work estimated to cost \$2,255,400.

"Do you know how to make a peach cordial?"
"Sure. Send her a box of candy."

San Francisco-Oakland Bridge Model



HERE is the first photograph of the model bridge from which designs are being shaped for the mammoth \$75,000,000 San Francisco-Oakland Bay Bridge.

Built to a scale of one-thousandth the actual size of the bridge to be erected, models have been constructed at the Engineering Department of the University of California at Berkeley by the State Engineers' Department, Professor Davis of the University and his classes.

These models have been put to a series of tests to determine strains and stresses and, from the results noted in these experiments, the engineers will determine upon the type of structure to span San Francisco Bay.

WORK HAS STARTED

Already work on the design of the real structure has started as a result of these experiments. Various plan layouts of that portion that will stretch between Yerba Buena Island and San Francisco are being made and estimates of cost compiled.

Two general plans are being considered; one consisting of two simple suspension spans with a central anchorage, the two main spans

being approximately 2300 feet in length. The other, a single suspension span with a 3800-foot central span.

Preliminary figures indicate that the single suspension span with a 3800-foot central opening would be considerably more expensive and probably more flexible.

General layouts and estimates of these two types of structure are being intensively studied and will be in shape for a decision to be arrived at when the Consulting Board meets again.

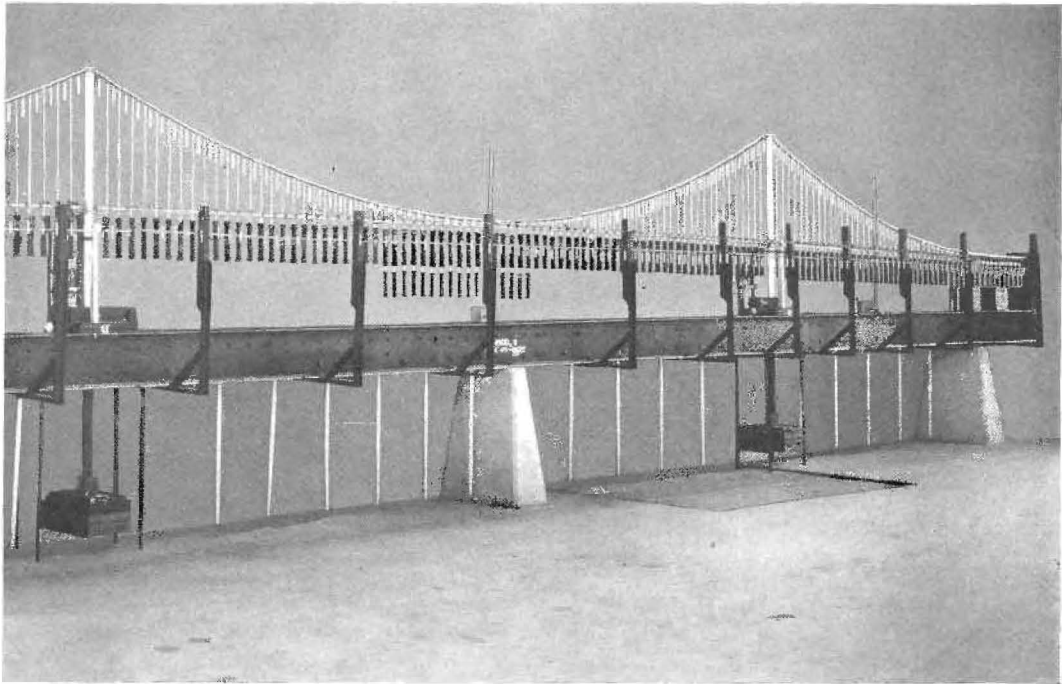
MAKING LOAD TESTS

The photograph above, taken by Lawton & McClure of San Francisco, represents one-half the bridge. The weights hanging from the top wires are used to test loads on the top cables. The vertical dotted line carries the roadways and breaks up distortions under load.

Next in order may be seen a string of horizontal black weights. These represent the weight of trusses and roadway. The little white weights at the bottom are hung from pulleys to represent "wind loads." In other

First Photograph of Test Set-up

(Continued from preceding page)



words the effect on the bridge of an 100-mile-an-hour gale has been tested by means of this model.

The heavy solid white verticals represent the towers of the bridge and at the bottom the white pillars may be noted two counter weights which represent the resistance the two towers would have against horizontal deflection at the top.

BORINGS COMPLETED

While these experiments have been taking place, very good progress has been made by the firm of Duncanson-Harrelson Co., in borings in the bay. Three holes have been put down at the second pier off Yerba Buena Island and rock has been encountered from 130 to 140 feet in depth.

Two diamond drill holes are nearly completed just east of the island for the first pier, where rock is encountered at 40 feet.

This work is being carried on as rapidly as possible, the contractor using three continuous shifts and with reasonable weather conditions the borings should be completed by the first of February.

Results of the borings to date indicate a slightly better foundation condition than was anticipated.

CAISSON WORK

It is hoped that the next meeting of the Consulting Board will be called early in January when designs and estimates will be advanced sufficiently, it is believed, to permit of final determination of the plan layouts.

The design and inspection forces now number slightly over fifty engineers who, with the exception of four, are citizens of the State of California.

CYCLIST WANTS TO PAY

A bicycle rider with a conscience so strong that he wants to pay a tax to the state for use of the public highways is reported by Russell Bevans, acting registrar of the Department of Motor Vehicles. C. G. J. Wolfe of Vallejo sent a check for \$1 to Bevans with the explanation that it was "from one who wishes to pay his little bit for benefits received."

Unfortunately for Wolfe's conscience, however, there is no authority in the law to permit acceptance of fees from bicycle riders who use only leg power and Bevans returned the check to him.

Local Water Problems Heard in Detail

(Continued from page 15)

initial plan. E. C. Eaton, Frank Hays, Wm. A. Johnstone and J. L. Matthews participated in the discussion of the State Water Plan and of the local problems of conservation.

On November 4th and 5th a two-day joint session was held in Los Angeles. The following members of the Commission and Committee were in attendance:

COMMISSIONERS

Hon. Matt I. Sullivan, Chairman
James M. Burke
Francis Carr
Shannon Crandall
R. C. Harbison
W. B. Mathews
Jesse Poundstone
A. B. Tarpey

EX OFFICIO MEMBERS

Major A. M. Barton
Colonel Walter E. Garrison
Edward Hyatt, Secretary

MEMBERS OF COMMITTEE

Senator B. S. Crittenden, Chairman
Assemblyman Robert P. Easley
Assemblyman Robert L. Patterson
Senator C. C. Baker
Senator Ralph H. Clock
Senator Frank W. Mixer
Senator W. P. Rich
Senator Andrew R. Schottky
Senator Ralph E. Swing
Assemblyman Edward Craig
Assemblyman Harold C. Cloudman
Assemblyman John E. Frazier
Assemblyman Frank S. Israel
Assemblyman Chester M. Kline

Senator Crittenden presided. The various southern California problems including the Colorado River, the Imperial Valley, Los Angeles County and the Coastal Counties of Ventura, Santa Barbara and San Luis Obispo were discussed by the people of these sections. The meetings were well attended and local conditions explained in detail. Supervisor John R. Quinn of Los Angeles County and E. C. Eaton, chief engineer of the Los Angeles County Flood Control District, presented the conservation and flood control problems of that county.

METROPOLITAN VIEWS

Carl A. Davis, deputy city attorney of Los Angeles, and J. B. Lippincott, consulting engineer, presented various problems of the metropolitan area. C. L. Preisker, chairman of the Board of Supervisors of Santa Barbara

County, John A. Jamison, president of the Montecito Water District, and A. C. Harbison of Ventura County presented the local conditions and problems of the coastal counties.

The Commission and Committee met with the Board of Directors of the Los Angeles Chamber of Commerce at lunch on November 5th and with the Water Committee of the State Chamber of Commerce in the evening. Among the principal speakers at the State Chamber of Commerce meeting were Lieutenant Governor Merriam, A. E. Miot of the Tulare County Board of Trade, S. Parker Frisselle of Fresno, Dr. Grinnell of Montague, Leo Hensel of Imperial, E. N. Richmond of San Jose, Senator Crittenden, chairman of the Legislative Committee and Shannon Crandall, vice chairman of the Governor's Commission.

TOPICS OUTLINED

Harrison S. Robinson, chairman of the Chamber of Commerce Water Committee, presided. He outlined a number of topics pertinent to the State Water Plan and called upon representatives from various parts of the State for discussion. Following this a general discussion of the State Water Problem was held.

This series of meetings brought out several important problems of state-wide interest and showed that a great deal of interest is being taken and much consideration given to the State Water Problem by the citizens of the State. The Committee and Commission secured the viewpoint of many areas regarding the State Water Plan and of the necessity for a coordinated program of conservation.

The California Joint Legislative Water Committee adjourned to meet in San Francisco on November 20th, and the California Water Resources Commission adjourned to meet in San Francisco on November 18th.

His wife: "Well, just look at your flattened derby. What caused that?"

Equipment Salesman: "The depression."

His wife: "Yes? Going to even blame that on depression?"

Equipment Salesman: "The depression is right, and I stick to my story. And here it is. We—or rather, I—was driving along at about fifty miles per hour and along comes a concrete dip, and I and the derby went up faster than the top of the car, and for no other reason than the depression in the highway."—*Texas Highways*.

Gleaned From the Letter Box

The following resolution commending the Division of Highways for the completion of that portion of Route 42 from Saratoga Gap to Waterman Switch was forwarded by the Board of Supervisors of Santa Cruz County:

On motion of Supervisor Pinkham, duly seconded by Supervisor Morgan, the following resolution is adopted:

RESOLUTION

WHEREAS, the building of the State highway on the Saratoga Gap, Big Basin road, between what is known as Waterman Gap and Saratoga Gap, is now completed, and

WHEREAS, the completion of the unit between the said Waterman Gap and Saratoga Gap has greatly relieved the traffic on the Santa Cruz-Los Gatos highway, and

WHEREAS, the completion of the said road is of great benefit not only to the people in the county of Santa Cruz, but also to many thousands of people from surrounding vicinities; therefore be it

RESOLVED, that this Board of Supervisors send a letter of thanks along with a copy of this resolution to John H. Skeggs, the Division Engineer of the California State Highway Department, and to the California State Highway Department; and be it further

RESOLVED, that in the said letter this Board of Supervisors express their thanks for the cooperation of the said John H. Skeggs and the California State Highway Department in completing the said road in such a wonderful manner, and thereby relieving the county of Santa Cruz from a congested traffic situation which was heretofore difficult to handle in order to insure safety to the traveling public.

Passed this 23d day of October, 1931, by the following vote: Ayes: Supervisors Lewis, Morgan, Pinkham, Rostrom and Ley. Noes: None, absent, none.

GEORGE N. LEY,

Chairman of the Board of Supervisors.

Attest: H. E. MILLER,

Clerk of Said Board.

* * * * *

Col. John H. Skeggs, Division Engineer,
State Highway Department,
San Francisco, California.

Dear Sir: We wish to commend the work of A. Walsh, resident engineer, in charge of the construction of the Saratoga Summit to Waterman Gap highway.

We feel that Mr. Walsh managed the construction of the highway very efficiently and we appreciate the consideration he showed us at all times. During the entire job he was courteous and efficient, cooperating with us in every way.

We have heard nothing but commendation of Mr. Walsh, both from those in his employ and those he contacted while the construction was under way. We are extremely proud of this new highway, and we feel that Mr. Walsh had no small part in its early and satisfactory completion.

We congratulate you on having in your employ a man as capable and likeable as Mr. Walsh, and we wish him the utmost success.

Very truly yours,

SAN LORENZO VALLEY CHAMBER
OF COMMERCE.

By (Signed) REBECCA PERDEW,
Secretary.

* * * * *

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

Dear Sir: The undersigned water users of the lower Feather River during July and August of the present season were faced with the shortage of water in the Feather River never before known in California. The Feather River from a short distance below Marysville to the point where it empties into the Sacramento River became entirely dry. Unless water was obtained within a very few days a large acreage of orchards and general farm products which depended on water from the Feather River faced a very serious loss.

We brought the above matter to your attention and you exerted to the utmost not only the prestige and authority as prescribed in the office of the State Engineer, but went considerably beyond that and used your personal connections and friendship to secure additional water for us. Our water shortage was relieved by your securing the release of additional water from the reservoirs of the Pacific Gas and Electric Company and a curtailment on the part of some of the larger users on the river above us.

We, as the chief beneficiaries of your very excellent services rendered at this time, wish to express to you our appreciation of your very fine work and your broad conception of the duties of your office in coming to our rescue.

Very sincerely yours,

GEO. G. POLLOCK,
SUTTER INVESTMENT CO.,
By J. C. BOYD, President.

BROWN & PURINTON,
By E. S. BROWN.

FARM LAND INV. CO.,
By J. W. LUCOR.

SUTTER BASIN CORPORATION, LTD.,
By EDW. SCHRANZ, JR., President.

RIDE IN CAR, NOT ON IT

Automobiles are built to ride in, not on, says a warning from the National Safety Council. Adults usually show better sense, but schools boys, (and some girls too) seem to think that even if a car is filled up, it will carry a few more on the running board, the spare tire, or the bumpers. The danger is apparent. In their merriment they may loose their hold. Bumps and ruts may cause them to fall off. Tire carriers or bumpers may break. It is a mighty dangerous way to travel.

California Highway Commission Policy Told to State Chamber of Commerce

Among the speakers at the annual meeting of the State Chamber of Commerce at Los Angeles, November 5th, was Earl Lee Kelly of Redding, Chairman of the California Highway Commission. Tracing the development of the State from the first pioneers of the covered wagon period and the winding trails of the padres into a mighty empire of six million people with 20,000 miles of paved highways, Mr. Kelly devoted a portion of his speech to the general policy of the Highway Commission, as reproduced in the following article:

By EARL LEE KELLY, Chairman California Highway Commission

I THINK for a moment I would like to dwell upon four of the important or major points in the policy of Governor Rolph's Highway Commission.

First—Our ten-year program.

Second—The orderly addition of roads to the state highway system.

Third—Cooperative construction with towns and cities.

Fourth—Increasing the safety of our state highways.

First, the ten-year program. A study of what our State highway problems during the next ten years will be has just been completed, including a thorough investigation of the following:

A complete traffic count has been made as well as an estimate of the traffic which will develop during the next ten years, including both volume and kind. Having in mind the traffic which will develop during this period, a study of the entire State highway system has now been completed and improvements planned which will have to be made during such time to adequately carry traffic.

Estimates were prepared for the improvements so that a good idea of the costs during the next ten years is known. An estimate of the revenue for State highway purposes to be anticipated during this period based on present laws has been made. In preparing the biennial budget for the construction and improvement of the State highway system, the California Highway Commission and the Department of Public Works are guided by the information gathered in this study. Every budget is a forward step in developing the entire highway system of California.

Addition of Roads to the State System

In line with instructions from the Legislature and in accordance with the policy of



EARL LEE KELLY

Governor Rolph an engineering and economic study is now under way of roads which appear to be eligible for inclusion into the State highway system. The roads recommended to the Legislature for inclusion will be selected only after a thorough study of the entire State has been made.

By following this policy roads will be added to the State highway system on the basis of the most good to all the people of the state and not for political reasons. Our State highway system will be gradually

More Safety Being Built Into Highways All Over the State

expanded to serve on an equal basis all of the people of all of California.

Cooperation with Cities.

The present administration has adopted the policy of cooperating with cities and towns in the improving of streets which are on the routes of State highways through the towns and cities. During the present biennium the Commission has under way or under negotiations cooperative projects with thirty-six cities and towns located all over the State with a total of \$2,554,000 as the value of the State's share of the work.

Increasing Safety Factors

With increasing volume of traffic and the tendency toward higher speeds, the necessity for building safety into the highways is becoming more and more pronounced. With this in mind the department is emphasizing better and more uniform alignment, ample shoulders along the pavements (8-foot shoulder on our trunk roads and as much as possible on mountain roads) widening and super-elevating the pavement on curves, non-skid surfaces on pavement, marking traffic lanes and installing guard rails, etc.

In conclusion, we should be ever watchful that the revenues of the State highway system shall not be diverted to other than highway uses. Fairness to the motorist requires this and fairness to the State highway system itself makes the same demand. If these revenues are not so protected the completion of our State highway system will be delayed for many years to the consequent injury of the entire State of California.

ARCHITECTURAL AWARDS

For Month of October

California School for Deaf, Berkeley—Primary School Building and Academic Dining Hall: for general work awarded to K. E. Parker Co., San Francisco, \$162,000; for plumbing work to Mechanical Contracting Company, San Francisco, \$8,360; for heating and ventilating work, to Alta Electric and Mechanical Co., San Francisco, \$16,960; for electrical work, to Alta Electric Mechanical Co., San Francisco, \$14,485.

Border Inspection Station, Department of Agriculture, Hornbrook: for complete construction to T. B. Goodwin, San Francisco, \$7,764.

Norwalk State Hospital—Installation of water pipe line to Johnson and Reeves, Glendale, \$7,631.

Preston School of Industry, Ione—Installation of penstock line to California Corrugated Culvert Co., \$22,827.

Maintenance Crews Keep Donner Pass Open Despite Snow

THE first heavy snow fall of the season in the Donner Summit region of the Sierra that started about 2 a.m. Saturday morning, November 14th, found the Maintenance Department of the Division of Highways well equipped for handling snow removal work between Colfax and the State line. At Colfax there are stationed two trucks equipped with straight push plows and one tractor grader with blade and "V" plow. This equipment handles the section from Colfax to Airport and also any necessary work west to Auburn.

For the section from Airport to Donner Lake two Maintenance Stations are maintained, one at Yuba Pass and one at Donner Summit. Nine snow plows operate between these two points. These units consist of heavy trucks, four being mounted with straight blade push plows, two with "V" type push plows, two of the auger blower type units, and one rotary shovel type.

WORK PROMPTLY BEGUN

At Truckee there are two straight blade plows mounted on trucks and one rotary shovel type.

As soon as word was received that snow was falling the organization was assembled and work started. The Donner Summit road was open to through traffic Sunday morning—full two-way width maintained. The snow fall there was 2½ feet in the first storm and increased to 54 inches in the following three days. The road was closed Sunday night and again at intervals during the storm as a measure of safety and to permit maintenance crews to work.

The department urgently advises motorists not to attempt to use the pass roads unless equipped with chains. Although the snow is cleared away low temperatures produce an icy, slippery road surface. Cars without chains are turned back by Motor Patrol officers.

It is the intention to start work with the beginning of each storm, and open up the road as soon as possible after the storm ceases. Gates are in place at Airport and at Truckee, and as soon as storm conditions prevail these gates are closed and watchmen placed on duty.

Vital Statistics on Dam Construction

Applications for approval of dams built prior to August 14, 1923, filed with the State Department of Public Works, Division of Water Resources, during the month of October, 1931.

LASSEN COUNTY—Ridenour Dam No. 255. S. D. Ridenour, Susanville, owner; earth, 17 feet above streambed with a storage capacity of 50 acre-feet, situated on unnamed drainage tributary to Susan River in Sec. 17, T. 29 S., R. 12 E., M. D. B. and M., for storage purposes, for irrigation and stock use.

MODOC COUNTY—McBrien Lake Dam No. 152-7. R. Lindauer, Alturas, owner; earth dam, 5 feet above streambed, situated on small ravine tributary to Pit River in Sec. 22, T. 42 N., R. 11 E., M. D. B. and M. For storage purposes, for irrigation use.

SANTA CRUZ COUNTY—Cowell Reservoir No. 22. City of Santa Cruz, Santa Cruz, owner; earth dam, 41 feet above streambed, High Street, City of Santa Cruz. For storage purposes, for municipal use.

SANTA CRUZ COUNTY—Bay St. Reservoir No. 22-2. City of Santa Cruz, Santa Cruz, owner; earth, 21 feet above streambed with a storage capacity of 117 acre-feet, located at Bay Street and Meder Street. For storage purposes, for municipal use.

MODOC COUNTY—Shelton Dam No. 170. A. A. Curtis, Canby, owner; flashboards, situated on Pit River tributary to Sacramento River in Sec. 33, T. 42 N., R. 9 E., M. D. B. and M. For diversion purposes, for irrigation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources during the month of October, 1931.

LOS ANGELES COUNTY—San Gabriel Dam No. 2, 32-5. Los Angeles County Flood Control District, Los Angeles, owner; rockfill, 260 feet above streambed with a storage capacity of 14,000 acre-feet, situated on West Fork San Gabriel Canyon tributary to San Gabriel River in Section 19, T. 2 N., R. 10 W., S. B. B. and M. For storage purposes, for flood control use. Estimated cost \$1,800,000, fees paid \$6,300.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources during the month of October, 1931.

NAPA COUNTY—Lake Marie Dam No. 1-6. Napa State Hospital, Imola, owner; earth, situated on Tulocay Creek tributary to Napa River in Sec. 19, T. 5 N., R. 3 W., M. D. B. and M.

SAN MATEO COUNTY—Dennis Martin Dam No. 810. A. Schilling, Redwood City, owner; earth, situated on Dennis Martin Creek tributary to San Francisco Creek and El Corte Madera Ranch.

SAN JOAQUIN COUNTY—Davis Dam No. 572. Ferroggiaro and Podesta, Linden, owner; earth, situated on Shaw Creek tributary to Calaveras River in Sec. 6, T. 2 N., R. 9 E., M. D. B. and M.

PLUMAS COUNTY—Grass Lake Dam No. 284. Carnation Gold Mining Company, Blairsden, owner; earth, situated on Little Jamison Creek tributary to Jamison Creek in Sec. 36, T. 22 N., R. 11 E., M. D. B. and M.

MODOC COUNTY—Big Sage Dam No. 55. Hot Spring Valley Irrigation District, Alturas, owner; earth, situated on Rattle Snake Creek tributary to Pit River in Sec. 1, T. 41 N., R. 13 E., M. D. B. and M.

CONTRA COSTA COUNTY—Mt. Diablo Country Club Dam No. 583-2. Mt. Diablo Country Club, Diablo, owner; earth, situated on unnamed creek tributary to Green Valley Creek in Sec. 14, T. 1 S., R. 1 W., M. D. B. and M.

SONOMA COUNTY—Lake Ralphine Dam No. 422. Santa Rosa Water Works, Santa Rosa, owner; earth, located in T. 7 N., R. 7 W., M. D. B. and M.

MODOC COUNTY—McBrien River Dam No. 152-6. R. Lindauer, Alturas, owner; flashboards, situated on Pit River tributary to Sacramento in Sec. 18, T. 42 N., R. 11 E., M. D. B. & M.

SHASTA COUNTY—Buckhorn Lake Dam No. 97-86. Pacific Gas and Electric Company, owner; earth, 6 feet above streambed with a storage capacity of 400 acre-feet, situated on North Cow Creek tributary to Sacramento River in Sec. 19, T. 33 N., R. 2 E., M. D. B. and M. For storage purposes, for power use.

SANTA CLARA COUNTY—Lake Ranch Dam No. 622. San Jose Water Works, San Jose, owner; earth, situated on Beardsley Creek tributary to Los Gatos Creek in Sec. 23, T. 8 S., R. 2 W., M. D. B. and M.

SANTA CLARA COUNTY—Upper Howell Dam No. 622-3. San Jose Water Works, San Jose, owner; earth, situated on Rundell Creek tributary to Los Gatos Creek in Sec. 31, T. 8 S., R. 1 W., M. D. B. and M.

MODOC COUNTY—Caldwell Upper Pit Dam No. 156-5. G. I. Kramer, Bleber, owner; crib, situated on Pit River tributary to Sacramento River in Sec. 34, T. 42 N., R. 10 E., M. D. B. and M.

MENDOCINO COUNTY—Mendocino Middle Dam No. 1-3. Mendocino State Hospital, Talmage, owner; gravity, situated on Mill Creek tributary to Russian River in Sec. 31, T. 15 N., R. 11 W., M. D. B. and M.

LOS ANGELES COUNTY—Greenleaf Reservoir No. 18. City of Whittier, Whittier, owner; earth, situated on tributary to San Gabriel River in Sec. 16, T. 2 S., R. 11 W., S. B. B. and M.

SONOMA COUNTY—Lawler Dam No. 581-3. California Water Service Company, San Francisco, owner; earth, situated on Adobe Creek tributary to Petaluma Creek in Sec. 12, T. 5 N., R. 7 W., M. D. B. and M.

MODOC COUNTY—Shelton Dam No. 170. A. A. Curtis, Canby, owner; flashboards, situated on Pit River tributary to Sacramento, in Sec. 36, T. 42 N., R. 9 E., M. D. B. and M.

PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of October, 1931.

TUOLUMNE COUNTY—Elglow Lake Dam No. 550. Tuolumne County, Sonora, owner; gravity, 8 feet above streambed with a storage capacity of 480 acre-feet; situated on East Fork Cherry River tributary to Tuolumne River in Sec. 35, T. 4 N., R. 21 E., M. D. B. and M. For storage purposes, for fish conservation use.

TUOLUMNE COUNTY—Buck Lake Dam No. 550-2. Tuolumne County, Sonora, owner; gravity, 8 feet above streambed, situated on Buck Meadows Creek tributary to W. Fork Cherry Creek in Sec. 24, T. 4 N., R. 20 E., M. D. B. and M. For storage purposes, for fish conservation use.

TUOLUMNE COUNTY—Emigrant Lake Dam No. 550-3. Tuolumne County, Sonora; gravity, 7 feet above streambed with a storage capacity of 1491 acre-feet, situated on North Fork Cherry Creek tributary to Tuolumne River in Sec. 30, T. 4 N., R. 21 E., M. D. B. and M. For storage purposes, for fish conservation use.

TUOLUMNE COUNTY—Upper Emigrant Lake Dam No. 550-4. Tuolumne County, Sonora, owner, gravity 8 feet above streambed with a storage capacity of 160 acre-feet, situated on North Fork Cherry Creek, tributary to Tuolumne River in Sec. 11, T. 4 N., R. 21 E., M. D. B. and M. For storage purposes, for fish conservation use.

TUOLUMNE COUNTY—Long Lake Dam No. 550-5. Tuolumne County, Sonora, owner; gravity, 8 feet above streambed with a storage capacity of 520 acre-feet, situated on West Fork Cherry Creek, tributary to Tuolumne River. For storage purposes, for fish conservation use.

LOS ANGELES COUNTY—Bouquet Canyon Dam No. 6-31. City of Los Angeles, Los Angeles, owner; earth, 170 feet above streambed with a storage capacity of 35,200 acre-feet, situated on Bouquet Creek tributary to Santa Clara River in Sec. 29, T. 6 N., R. 14 W., S. B. B. and M. For storage purposes, for municipal use.

(Continued on page 38)

\$6,916,996 for Southern Counties

Highway improvements totaling close to seven million dollars are scheduled for Southern California, all of which will be advertised for bids prior to April 1, 1932. This announcement was made in the report of the Department of Public Works presented at the Governor's Council meeting of November 24th. The projects which include grading, paving, widening, surfacing operation and bridge construction are as follows:

Description	Miles	Type	Amount
Carlsbad to Oceanside.....	0.3	Grade	\$5,300
Tecate Divide to Boulder Park.....	14.6	Gr. and P. C. C. Pave.	440,000
Coyote Wells to Dixieland.....	14.7	Gr. and A. C. Pave	598,000
Cambria to San Simeon.....	8.6	Gr. and Surf.	210,000
Los Alamos Creek Bridge.....		Bridge	31,000
Plaza Garage Grade Separation.....			50,000
Lemon Cove to Three Rivers.....	10.6	Gr. and Surf.	350,000
Grapevine Sta. to 3 miles south.....	3.0	Gr. and Pave	520,000
Plaza Garage to Goshen and Plaza Garage to 0.3 of a mile westerly.....	5.8	Gr. and Pave.	272,000
Las Flores Canyon to Santa Ynez.....	7.4	Gr. and Pave.	294,400
Dana Point to Laguna Beach.....	5.6	Gr. and Pave.	470,000
Irvine to Tustin.....	5.7	Widen Pave.	184,096
Newport to Corona Del Mar.....	3.7	Gr. and Pave.	203,233
El Cajon to Las Coches Cr., portions.....	3.5	Gr. and Pave.	191,566
Oxnard to El Rio.....	1.1	Widen Pave.	26,400
Tujunga to La Canada.....	5.0	Gr. and Bridges	127,000
Canton Creek to Piru Creek.....		Bridges	492,103
San Diego to Oceanside.....	2.9	Pave. Exceptions	87,000
Ventura to El Rio.....	4.5	Gr. and Pave	100,000
Baker east 10 miles.....	10.0	Gr. and Surf.	334,498
Mecca-Blythe Road, portions.....	16.0	Gr. and Surf.	700,000
West entrance to San Bernardino.....		Gr. and Pave.	150,000
6 mi. N. Imperial Co. line to Av. 62.....	8.3	Gr. and Pave.	481,400
Imperial Co. line to 6 mi. north.....	6.0	Gr. and Pave.	390,000
Sepulveda Blvd. to Calabasas.....	10.5	Pave.	209,000
Total			\$6,916,996

TRAFFIC SHOWS INCREASE

An increase of 1.9 per cent in the number of vehicles using the Minnesota trunk highways, is shown by the annual traffic census taken by the Minnesota highway department. Although the increase is not as large as in some years, Commissioner C. M. Babcock says it indicates that Minnesota is in better shape than some other states that have shown a decrease in their traffic counts.

DIDN'T GO OVER

She—You never hear of women cashiers running off with their employer's money.
He—Not often, but when it does happen they take the employer, too.—*Gridley Daily Globe.*

PREVENTION PAYS

W. H. Cameron, managing director of the National Safety Council, recently pointed out that the strength of the organized safety movement in the United States lies in the fact that "it is cheaper to prevent an accident than to pay for it."

As a rule, we look on accident prevention activity as being a humanitarian work—as a saver of lives. And that, of course, is the first need. But it likewise pays for itself, time and again, in plain dollars and cents.

How much time elapses between the changing of a traffic light from red to green and the honking of the horn in the car behind you? Figure in fractions of seconds.—*Judge.*

October Water Applications and Permits

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources, during the month of October, 1931.

MENDOCINO COUNTY—Application 7086. State of California, Department of Public Works, Division of Highways, c/o C. H. Purcell, State Highway Engineer, Public Works Building, Sacramento, California, for 500 gallons per day from unnamed spring tributary to South Fork of Eel River. To be diverted in Sec. 20, T. 24 N., R. 17 W., M. D. B. and M., for recreational purposes. Estimated cost \$250.

FRESNO COUNTY—Application 7087. Consolidated Irrigation District, c/o A. R. Stedman, Secretary, P. O. Box 638, Selma, California, for 5000 c. f. s. from San Joaquin River tributary to San Francisco Bay. To be diverted in Sec. 5, T. 11 S., R. 21 E., M. D. B. and M., for power purposes (148,000 H. P.). Estimated cost \$10,600,000.

SHASTA COUNTY—Application 7088. O. R. Smith, R. F. D. No. 1, Gerber, California, for 1000 acre-feet per annum from North Digger Creek tributary to Battle Creek, thence Sacramento River. To be diverted in Sec. 25, T. 30 N., R. 3 E., M. D. B. and M., for irrigation and domestic purposes (522.5 acres). Estimated cost \$50.

VENTURA COUNTY—Application 7089. Evelyn Akin Robertson, Box 997, Ventura, California, for 0.35 c. f. s. from unnamed spring tributary to Cuyama River. To be diverted in Sec. 12, T. 7 N., R. 24 W., S. B. B. and M., for irrigation and domestic purposes (10 acres). Estimated cost \$300.

CALAVERAS COUNTY—Application 7090. Harry D. Thompson, c/o Virgil M. Alrola, Attorney, Whitlock Building, San Andreas, California, for 1000 gallons per day from Thompson Spring (developed by applicant). To be diverted in Sec. 6, T. 4 N., R. 13 E., M. D. B. and M., for irrigation and domestic purposes (1 acre). Estimated cost \$200.

HUMBOLDT COUNTY—Application 7091. John W. Bergin, Weaverville, California, for 150 c. f. s. from Willow Creek tributary to Trinity River. To be diverted in Sec. 11, T. 6 N., R. 4 E., H. B. and M., for mining purposes. Estimated cost \$150,000.

EL DORADO COUNTY—Application 7092. B. W. Stone, 161 Ellis Street, San Francisco, California, for total of 500 c. f. s. and 125,000 acre-feet per annum from (1) Rubicon River (2) Pilot Creek (3) Gerle Creek (4) Loon Lake (5) Buck Island Lake (6) Rock Bound Lake (7) Little South Fork of Rubicon River tributary to American River Drainage. To be diverted in Sec. 9, T. 13 N., R. 16 E., M. D. B. and M.; Sec. 11, T. 12 N., R. 12 E., M. D. B. and M.; Sec. 24, T. 13 N., R. 13 E., M. D. B. and M.; Secs. 1, 31 and 34, T. 14 N., R. 14 E., M. D. B. and M.; Sec. 4, T. 13 N., R. 15 E., M. D. B. and M.; and Sec. 2, T. 13 N., R. 14 E., M. D. B. and M., for municipal purposes.

PLACER COUNTY—Application 7093. C. T. Horgan, 574 47th Street, Oakland, California, for 2 c. f. s. from unnamed stream tributary to Middle Fork of American River. To be diverted in Sec. 3, T. 13 N., R. 10 E., M. D. B. and M., for irrigation purposes and domestic purposes (160 acres). Estimated cost \$500.

DEL NORTE COUNTY—Application 7094. H. L. Hawkins and Lee Brown, c/o H. L. Hawkins, 931 2d Street, Crescent City, California, for c. f. s. from Diamond Creek tributary to North Fork of Smith River. To be diverted in Section 11, T. 18 N., R. 2 E., H. B. and M., for mining and domestic purposes. Estimated cost \$20.

MENDOCINO COUNTY—Application 7095. W. M. Yorgason, Fort Bragg, California, for 4 miners inches from South Fork of Digger Creek tributary to Digger Creek, thence Pacific Ocean. To be diverted in Sec. 19, T. 18 N., R. 17 W., M. D. B. and M., for irrigation and domestic purposes (3 acre).

PLACER COUNTY—Application 7096. Carrie A. Gladding, Lincoln, California, for 3 c. f. s. and 200 acre-feet per annum from Coon Creek tributary to Feather River. To be diverted in Sec. 22, T. 13 N., R. 6 E., M. D. B. and M., for irrigation and domestic purposes (400 acres). Estimated cost \$4,000.

MONO COUNTY—Application 7097. Lucile E. Bogard, Hawthorne, Nevada, for 1.0 c. f. s. from unnamed springs tributary to Mono Lake. To be

diverted in Section 20, T. 3 N., R. 26 E., M. D. B. and M., for mining and domestic purposes.

MONO COUNTY—Application 7098. Lucile E. Bogard, Hawthorne, Nevada, for 1.0 c. f. s. from unnamed springs tributary to Mono Lake. To be diverted in Sec. 28, T. 3 N., R. 26 E., M. D. B. and M., for mining and domestic purposes.

SANTA CLARA COUNTY—Application 7099. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 200 c. f. s. and 60,000 acre-feet per annum from Coyote River, tributary to San Francisco Bay. To be diverted in Sec. 10, T. 9 S., R. 3 E., M. D. B. and M., for irrigation and domestic purposes (133,000 acres). Estimated cost \$1,500,000.

SANTA CLARA COUNTY—Application 7100. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 30 c. f. s. and 5000 acre-feet per annum from Arroyo Calero River, tributary to Alamos Creek. To be diverted in Sec. 31, T. 9 S., R. 2 E., M. D. B. and M., for irrigation and domestic purposes (133,000 acres). Estimated cost \$380,000.

SANTA CLARA COUNTY—Application 7101. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 30 c. f. s. and 2500 acre-feet per annum from Almaden Creek tributary to Alamos and Guadalupe Creek. To be diverted in Section 10, T. 9 S., R. 1 E., M. D. B. and M., for irrigation and domestic purposes (133,000 acres).

SANTA CLARA COUNTY—Application 7102. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 45 c. f. s. and 100 acre-feet per annum from Guadalupe Creek tributary to San Francisco Bay. To be diverted in Sec. 9, T. 8 S., R. 1 E., M. D. B. and M., for irrigation and domestic purposes (133,000 acres). Estimated cost \$53,500.

SANTA CLARA COUNTY—Application 7103. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 50 c. f. s. and 3,500 acre-feet per annum from Guadalupe Creek tributary to San Francisco Bay. To be diverted in Sec. 19, T. 8 S., R. 1 E., M. D. B. and M., for irrigation and domestic purposes (133,000 acres). Estimated cost \$377,170.

SANTA CLARA COUNTY—Application 7104. Santa Clara Valley Water Conservation District, c/o Fred H. Tibbetts, Alaska Commercial Building, San Francisco, California, for 50 c. f. s. and 4,000 acre-feet per annum from Stevens Creek tributary to San Francisco Bay. To be diverted in Sec. 27, T. 7 S., R. 2 W., M. D. B. and M., for irrigation and domestic purposes (133,000 acres). Estimated cost \$350,000.

SISKIYOU COUNTY—Application 7105. Harry D. Maltis, Costella, California, for 1.0 c. f. s. from Cole Creek, tributary to South Fork of Indian Creek. To be diverted in Sec. 10, T. 17 N., R. 6 E., H. M., for mining and domestic purposes. Estimated cost \$20.

TUOLUMNE COUNTY—Application 7106. United States-Stanislaus National Forest, Sonora, California, for (1) 360 acre-feet per annum from Lower Buck Lake; (2) 520 acre-feet per annum from Long Lake; (3) 160 acre-feet per annum from Emigrant Meadow Lake; (4) 1491 acre-feet per annum from Emigrant Lake; and (5) 460 acre-feet per annum from Bigelow Lake tributary to Tuolumne River Watershed. To be diverted in Secs. (1) 26 and (2) 27, T. 4 N., R. 20 E., M. D. B. and M., and Secs. (3) 10, (4) 30 and (5) 35, T. 4 N., R. 21 E., M. D. B. and M., for maintenance of fish life and other recreational purposes.

LOS ANGELES COUNTY—Application 7107. H. H. Townsend, 6029 Hollywood Boulevard, Los Angeles, California, for 0.001 c. f. s. from unnamed spring tributary to Piru Creek. To be diverted in Sec. 19, T. 6 N., R. 17 W., S. B. B. and M., for domestic and stock watering purposes.

LAKE COUNTY—Application 7108. Elizabeth M. Robinson, c/o Chas. L. Gilmore, Attorney, Capital National Bank Building, Sacramento, California, for 0.10 c. f. s. from unnamed spring tributary to Clear Lake. To be diverted in Section 32, T. 15 N., R. 8 W., M. D. B. and M., for irrigation and domestic purposes.

Applications and Permits Granted

(Continued from preceding page)

ORANGE COUNTY—Application 7109. United States, Cleveland National Forest, 310 Federal Building, San Diego, California, for 0.003 c. f. s. from San Juan Creek tributary to Pacific Ocean. To be diverted in Sec. 3, T. 7 S., R. 6 W., S. B. E. and M., for domestic purposes. Estimated cost \$500.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of October, 1931.

SUTTER COUNTY—Permit 3793, Application 6892. Andreas C. H. Smith, Yuba City, Sutter County, California, October 3, 1931, for 1.10 c. f. s. from Feather River in Sec. 11, T. 14 N., R. 3 E., M. D. B. and M., for irrigation of 81.65 acres. Estimated cost \$1,500.

STANISLAUS COUNTY—Permit 3794, Application 6894. E. B. Henry, Route 3, Box 947, Modesto, California, October 5, 1931, for 0.70 c. f. s. from Tuolumne River, tributary of San Joaquin River in Sec. 7, T. 4 S., R. 8 E., M. D. B. and M., for domestic use and the irrigation of 58 acres. Estimated cost \$1,000.

BUTTE COUNTY—Permit 3795, Application 6887. Shelley E. Lee, Box C, Biggs, Calif., October 5, 1931, 3.00 c. f. s. from Lateral "A" Reclamation District 833 tributary to Butte Creek and Sacramento River in Sec. 18, T. 18 N., R. 2 E., M. D. B. and M., for the irrigation of 130.9 acres.

BUTTE COUNTY—Permit 3796, Application 6905. California Mutual Building and Loan Association of San Jose, California, October 5, 1931, for 14.78 c. f. s. from Lateral "A" Drainage Canal of Reclamation District No. 833 in Sec. 19, T. 18 N., R. 2 E., M. D. B. and M., for the irrigation of 591.2 acres.

EL DORADO COUNTY—Permit 3797, Application 6899. R. P. Easley et al., Antioch, Calif., October 7, 1931, for 800 gal. per day from an unnamed stream tributary to South Fork American River in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes at four lots. Estimated cost \$500.

EL DORADO COUNTY—Permit 3798, Application 7028. Lawrence B. Kinnear, 309 4th Street, Antioch, Calif., October 7, 1931, for 200 gals. per day from an unnamed stream, tributary to South Fork American River, in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes. Estimated cost \$200.

EL DORADO COUNTY—Permit 3799, Application 7036. George W. Harter and Mrs. W. W. Belshaw of Antioch, Calif., October 7, 1931, for 400 gals. per day from a spring tributary to South Fork American River in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes.

SIERRA COUNTY—Permit 3800, Application 6600. E. A. Humphreys, c/o R. F. Taylor, Downsville, Calif., October 7, 1931, for 25.00 c. f. s. from South Fork of North Fork of Yuba River, in Sec. 30, T. 20 N., R. 12 E., M. D. B. and M., for mining purposes. Estimated cost \$5,000.

SAN JOAQUIN COUNTY—Permit 3801, Application 6877. J. L. Blossom, and F. M. Lamb, c/o Ohm & Raab, 109 Weber Ave., Stockton, Calif., October 7, 1931, for 15.15 c. f. s. from North Canal tributary to Middle Branch of San Joaquin River in Sec. 35, T. 1 N., R. 4 E., M. D. B. and M., for irrigation of 1212.6 acres. Estimated cost \$14,000.

SUTTER COUNTY—Permit 3802, Application 6933. D. C. Smith, Meridian, Calif., October 7, 1931, for 3.00 c. f. s. from Butte Slough in Sec. 36, T. 16 N., R. 1 W., M. D. B. and M., for the irrigation of 238 acres. Estimated cost \$1,200.

BUTTE COUNTY—Permit 3803, Application 6945. K. Jacobsen, Gridley, Calif., October 8, 1931, for 3.00 c. f. s. from Main Drain of Reclamation District No. 2054 tributary to Sacramento River in Secs. 16 and 21, T. 17 N., R. 2 E., M. D. B. and M., for the irrigation of 632 acres. Estimated cost \$300.

TRINITY COUNTY—Permit 3804, Application 6978. Edward L. Schrockengost, Douglas City, Calif., October 8, 1931, for 2.00 c. f. s. from Brown Creek tributary to Trinity River in Section 13, T. 31 N., R. 9 W., M. D. B. and M., for mining purposes. Estimated cost \$600.

PLUMAS COUNTY—Permit 3805, Application 6996. Wm. Rutherford et al., c/o Wm. Rutherford, P. O. Box 288, Sacramento, Calif., October 8, 1931, for

0.10 c. f. s. and 9 acre-feet from unnamed stream tributary to Middle Fork Feather River in Sec. 16, T. 23 N., R. 7 E., M. D. B. and M., for mining and domestic purposes.

EL DORADO COUNTY—Permit 3806, Application 7013. Edward J. Schoenbacher, 3557 Folsom Blvd., and Frank J. Marray, 640 36th Street, Sacramento, Calif., October 8, 1931, for 400 gals. per day from Bull Creek tributary to South Fork American River in Sec. 29, T. 11 N., R. 14 E., M. D. B. and M., for domestic purposes.

SAN JOAQUIN COUNTY—Permit 3807, Application 6936. O. C. Cutts, Stockton, Calif., October 9, 1931, for 1.00 c. f. s. from San Joaquin River in Sec. 21, T. 1 N., R. 6 E., M. D. B. and M., for the irrigation of 79 acres. Estimated cost \$10,000.

EL DORADO COUNTY—Permit 3808, Application 7018. Mrs. B. M. Fountain, 2901 I Street, Sacramento, Calif., October 9, 1931, for 400 gals. per day from a spring tributary to South Fork American River in Sec. 23, T. 11 N., R. 15 E., M. D. B. and M., for domestic purposes. Estimated cost \$50.

TRINITY COUNTY—Permit 3809, Application 6982. Basil Froloff, Weaverville, Calif., October 9, 1931, for 12.50 c. f. s. from Rush Creek tributary to Trinity River in Sec. 21, T. 34 N., R. 9 W., M. D. B. and M., for mining and domestic purposes. Estimated cost \$50.

MONO COUNTY—Permit 3810, Application 6961. Rex M. Foster, Bridgeport, Calif., October 23, 1931, for 0.11 c. f. s. from Spring Creek tributary to Green Creek in Sec. 23, T. 3 N., R. 24 E., M. D. B. and M., for power purposes. Estimated cost \$25.

TRINITY COUNTY—Permit 3811, Application 6946. Trinity Placer Corporation Ltd., Los Angeles, Calif., October 26, 1931, for 100.00 c. f. s. from Soldier Creek, Fork of Soldier Creek, tributary to Trinity River in Sec. 25, T. 33 N., R. 11 W., M. D. B. and M., for mining and domestic purposes.

In Memoriam

CLIFFORD K. ALDRICH, Division of Architecture, received injuries in an automobile accident August 20, 1931, resulting in his death on August 22, 1931.

The deceased was born in 1881 in Creston, Iowa, where he lived and received his early education. After finishing high school, Mr. Aldrich completed his education at the Iowa State College, Chicago School of Architecture, Armour Institute and Art Institute receiving his degree in Architecture in 1903. He was a certified architect in California and a member of the American Institute of Architects.

Mr. Aldrich entered the service of the State of California with the Division of Architecture in 1908 and served well in various capacities until his death, at which time he was Superintendent of Building Construction at the California Polytechnic School, San Luis Obispo.

RAYMOND W. ZEHRING, draftsman in the office of District VII, Division of Highways, since June, 1931, and formerly employed as draftsman in the office of District III, died suddenly on October 13, 1931, of apoplexy while attending Reserve Officers' Training Camp at Monterey.

Longest Concrete Arch in State Among Carmel Coast Link Bridges

By JAMES GALLAGHER, Assistant Bridge Engineer

THE CALIFORNIA coast extending south from Carmel to the Big Sur is one of the most rugged and scenic bits of coastline in the State. It is a stretch of precipitous cliffs and bold headlands broken by deep gorges and inlets of the sea.

The building of this thirty mile section of the Coast Highway, known as State Highway Route No. 56 involves heavy construction and a number of bridge structures, one of which will have the longest concrete span in California.

Two of these bridges, the Garrapata Creek and Granite Creek are the first to be completed of five arch structures to be built during the present biennium.

Garrapata Creek Bridge was completed in November and is now open to traffic. The Granite Creek Bridge is scheduled for completion the middle of February but the contractor is well ahead of schedule and it is expected the bridge will be finished about the first of the year.

SPANS CREEK GORGE

The highway crosses Garrapata Creek thirteen miles south of Carmel. The creek is in a deep gorge extending inland 1000 feet or more from the ocean. The new bridge over this creek is an open spandrel reinforced concrete arch, span one hundred and fifty feet, with one twenty-five foot girder approach span on the north end and four twenty-five foot girder spans on the south.

The total length of the bridge is 285 feet and width of roadway 24 feet. The height of the roadway above the creek bed is about 85 feet. This new concrete bridge replaces an old narrow steel bridge which had become so badly rusted, due to its proximity to the ocean, that it was no longer safe for use and during the past year traffic has been detoured over a small temporary timber bridge at the head of the gorge.

OVER THE SEA

Granite Creek, eleven miles south of Carmel, is a small stream emptying into a narrow rocky ocean inlet. The steep sides of the inlet are granite into which caves have been eroded by the ocean waves. The center line of the highway crosses the head of this

inlet so that the sea will dash under the new bridge.

This reinforced concrete structure has an arch span of 120 feet with two 36-foot girder approach spans on the north and two 44-foot girder spans on the south. The total length of the bridge is 288 feet. The width of roadway is 24 feet. It is more than 100 feet from the level of the roadway to the bottom of the inlet.

This bridge is built on a horizontal curve of 4000 feet radius. The approach grades are $2\frac{1}{2}$ per cent and 3 per cent connected by a 200 foot vertical curve. The old highway here winds up one side of the canyon and back on the other side with sharp turns and steep grades crossing the creek with only a small one span timber bridge.

Garrapata Creek Bridge was built by Hanrahan Company of San Francisco at a cost of approximately \$35,500, excluding approach grading. O. R. Bosso was resident engineer.

Granite Creek Bridge is being built by Geo. J. Ulrich Construction Company of Modesto, at a cost of \$33,700. W. E. Sutton is resident engineer.

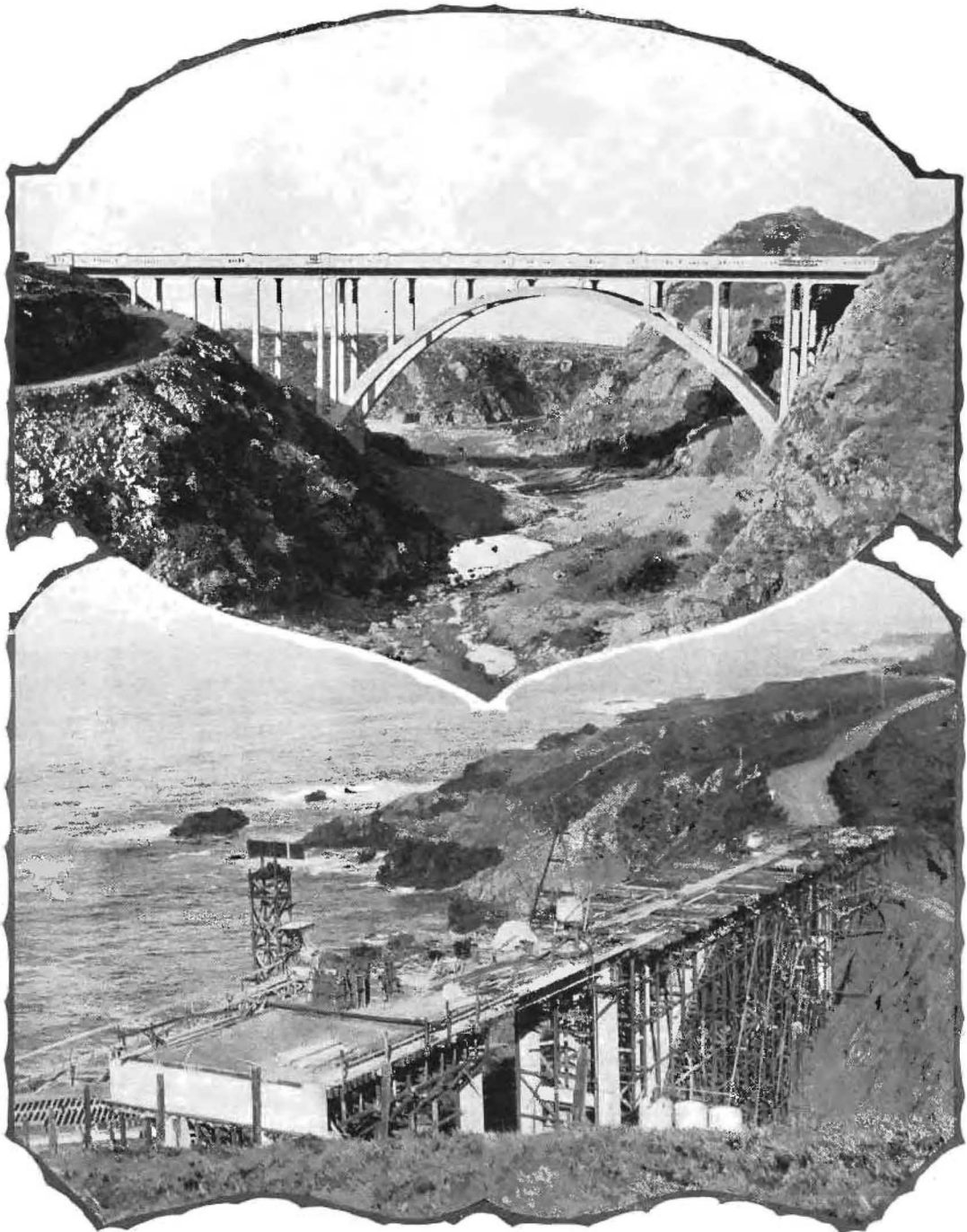
LONGEST SPAN

Five miles south of Garrapata Creek a reinforced concrete arch is being built across Bixby Creek with a main span of 330 feet and nine 40-foot girder approach spans. This will be the longest concrete arch span on the California State Highways.

The contract price is \$203,334. Ward Engineering Co. of San Francisco are the contractors and I. O. Jahlstrom, resident engineer. This bridge is scheduled for completion in June, 1932.

About the first of the year bids will be received for an arch bridge over Rocky Creek, about one-half mile north of Bixby Creek. The Rocky Creek Bridge will cost in the neighborhood of \$100,000.

Plans are also being prepared for an arch bridge over Wildcat Creek five and one-half miles south of Carmel. This is a highly developed resident section and a special study is being made to have the bridge harmonize with its surroundings.



BEAUTIFUL BRIDGES, an imposing series of them, will mark the new State highway now in course of construction along the rugged coast between Carmel and San Simeon. One of the most scenic portions of the Pacific shoreline, this section is indented by arms of the sea and furrowed by deep gorges through which mountain streams reach the ocean making bridges necessary for a direct highway route. Five of them are required in a distance of thirty miles. Two of these are the Garrapata Creek Bridge shown at the top, a 285-foot structure, sixteen miles south of Carmel, completed and opened to traffic this month and the Granite Creek Bridge, eleven miles south of Carmel and 288 feet long, shown in the lower picture, which will be completed in February.

Highway Bids and Awards for October

ALAMEDA COUNTY—Between Greenville and Livermore, about 5.2 miles to be graded and paved with asphalt concrete. Dist. IV, Rt. 5, Sec. 4, Southern California Roads Co., Los Angeles, \$125,105; Valley Paving and Construction Co., Fresno, \$149,993; A. Teichert & Son, Inc., Sacramento, \$140,724; S. H. Palmer, San Francisco, \$167,349; California Construction Co., San Francisco, \$133,248; Heafey-Moore Co., Oakland, \$168,535; Hanrahan Co., San Francisco, \$121,862; Morrison-Knudsen Co., Boise, Idaho, \$178,144. Contract awarded to Jones and King, Hayward, \$116,328.

BUTTE AND GLENN COUNTIES—Reconstructing timber deck of one 318-foot 4-inch swing span and two 134-foot 9-inch approach spans of bridge across Sacramento River near Hamilton City. Dist. III, Rt. 47, Sec. A, Campbell Construction Co., Sacramento, \$9,660; Ralph Hunter, Sacramento, \$11,230; M. R. Peterson, Sacramento, \$11,542; Holdener Construction Co., Sacramento, \$10,265; John Berlinger, Orland, \$11,550; Lindgren & Swinerton, Inc., Sacramento, \$12,130; H. C. Martin, Sacramento, \$12,582; Gutleben Bros., Oakland, \$9,526; M. A. Jenkins, Sacramento, \$10,608; John W. Halterman, Willows, \$9,327; P. F. Bender, North Sacramento, \$11,934. Contract awarded to R. B. McKenzie, Red Bluff, \$9,150.

GLENN COUNTY—Removing timber deck and rails of the three steel stringer bridges across draws between 20 and 22 miles east of Willows, constructing laminated timber floor, timber rails and adding steel stringers. Dist. III, Rt. 45, Sec. C, Tieslau Bros., Berkeley, \$9,234; J. P. Brennan, Redding, \$9,559; M. R. Peterson, Sacramento, \$9,816; M. A. Jenkins, Sacramento, \$9,270; Peter F. Bender, North Sacramento, \$8,195; Lindgren & Swinerton, Sacramento, \$9,422; H. Gould, Sacramento, \$10,790; John Berlinger, Orland, \$8,461; R. B. McKenzie, Red Bluff, \$9,308; J. W. Halterman, Willows, \$8,785. Contract awarded to Hugh C. Martin, Sacramento, \$8,117.

LOS ANGELES COUNTY—Between La Canada and Mt. Wilson, about 1.4 miles to be treated with heavy fuel oil. Dist. VII, Rt. 61, Sec. A, C. A. Ladeveze, Los Angeles, \$1,800; Gilmore Oil Co., Ltd., Los Angeles, \$1,968; The Petrol Corporation, Los Angeles, \$2,004; Pacific Tank Lines, Inc., Los Angeles, \$2,320. Contract awarded to Square Oil Co., Inc., Los Angeles, \$1,248.

LOS ANGELES COUNTY—Washington Boulevard to El Segundo, 5.1 miles to be graded and paved with Portland cement concrete. Dist. VII, Rt. 60, Sec. C, Macco Construction Co., Clearwater, \$320,624; Kovacevich & Price, Inc., South Gate, \$282,984; Matich Bros., Elsinore, \$289,831; Gibbons & Reed Co., Burbank, \$232,171; Oswald Bros., Los Angeles, \$310,183; R. A. Watson, Los Angeles, \$310,845; McCray Co., Los Angeles, \$313,703; Sander Pearson, Santa Monica, \$318,191; Geo. E. Curtis Paving Co., Los Angeles, \$341,474; Griffith Co., Los Angeles, \$291,263; Basich Bros., Torrance, \$286,358. Contract awarded to Jahn and Bressal Construction Co., Inc., Los Angeles, \$273,473.

MENDOCINO COUNTY—Through Boonville, 1.10 miles to be graded and surfaced with screened gravel. Dist. IV, Rt. 48, Sec. B, Chas. N. Chittenden, Napa, \$14,161; Albert Helwig, Sebastopol, \$13,951. Contract awarded to Peter McHugh, San Francisco, \$11,569.

MERCED COUNTY—Three timber bridges near Los Banos, one of five 19-foot spans, one of sixteen 19-foot spans and one of twelve 19-foot spans. Dist. VI, Rt. 32, Secs. B and C, Peter McHugh, San Francisco, \$34,763; Force Construction Co., Piedmont, \$40,109; J. W. Hoopes, Sacramento, \$34,004; L. C. Clark and C. E. Doughty, Visalia, \$32,154; M. B. McGowan, San Francisco, \$34,344; A. W. Kitchen, San Francisco, \$33,946; R. H. Travers, Los Angeles, \$36,265; Lord and Bishop, Sacramento, \$32,728; E. K. Angle, Dos Palos, \$31,687. Contract awarded to Thermotite Construction, Inc., San Jose, \$20,098.

MONTEREY COUNTY—At Bradley, about 0.5 mile to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. I, W. A. Dontanville, Salinas, \$39,951; J. L. Conner, Monterey, \$34,825; Granite Construction Co., Ltd., Watsonville, \$28,469; Gist & Bell, Arcadia, \$34,878; Fred W. Nighbert, Bakersfield, \$38,594; C. W. Wood, Stockton, \$32,247; Lord and Bishop, Sacramento, \$31,164. Contract awarded to Steele Finley, Santa Ana, \$27,392.

MONTEREY COUNTY—Between Rocky Creek and San Remo Divide, about 8.3 miles to be graded and surfaced with selected material. Dist. V, Rt. 56, Secs. G-H, Macco Construction Co., Clearwater, \$233,384; C. G. Willis & Sons, Los Angeles, \$240,001; Granfield, Farrar & Carlin, San Francisco, \$200,760; Granite Construction Co., Ltd., Watsonville, \$211,982; C. W. Wood, Stockton, \$228,522; Clark & Henry Construction Co., San Francisco, \$243,337; Hemstreet & Bell, Marysville, \$193,236; Peter McHugh, San Francisco, \$239,871; M. J. Murphy, Inc., Carmel, \$217,662; Chas. Harlowe, Jr., Oakland, \$237,215; S. H. Palmer, San Francisco, \$273,801; Healy-Tibbitts Construction Co., San Francisco, \$176,709; M. J. Bevanda, Stockton, \$193,862; Lang Transportation Co., Los Angeles, \$252,340; Lewis Construction Co., Los Angeles, \$233,339; Porter Bros. Corporation, San Francisco, \$275,112; J. L. Conner, Monterey, \$189,781; Guy F. Atkinson Co., San Francisco, \$232,589; Skeels & Graham Co., Roseville, \$239,579; von der Hellen & Pierson, Castaic, \$212,956; Contoules Construction Co., San Francisco, \$242,317; Isbell Construction Co., Carson City, Nevada, \$225,679; Geo. Pollock Co., Sacramento, \$219,749; Larsen Bros., Galt, \$197,191; Morrison-Knudsen Co., Boise, Idaho, \$187,402. Contract awarded to D. McDonald, Sacramento, \$169,991.

ORANGE COUNTY—About 0.3 mile of highway embankment to be dredged from the channel known as the North Arm of Newport Bay. Dist. VII, Rt. 60, Sec. B. Contract awarded to Sparkes & McClellan, Newport Beach, \$9,100.

PLACER COUNTY—Between Newcastle and Wise Power House, about 2.7 miles; about 1.6 miles to be graded and about 2.7 miles to be paved with Portland cement concrete. Dist. III, Rt. 17, Sec. B, C. W. Wood, Stockton, \$109,783; Frederickson & Watson Construction Co., and Frederickson Bros., Oakland, \$103,181; N. M. Ball, Berkeley, \$103,383; John Doyle, San Jose, \$148,564; T. M. Morgan Paving Co., Los Angeles, \$127,604; Morrison-Knudsen Co., Boise, Idaho, \$113,774. Contract awarded to Hanrahan Co., San Francisco, \$102,962.

RIVERSIDE COUNTY—Near Bendel's Corner, from Mile Post 83.9 to Mile Post 85.4, 1.5 miles, heavy fuel oil to be applied to shoulders. Dist. VIII, Rt. 24, Sec. G, Paulsen & March, Inc., Los Angeles, \$1,274; Square Oil Co., Inc., Los Angeles, \$1,266; Pacific Tank Lines, Inc., Los Angeles, \$1,508; Gilmore Oil Co., Ltd., Los Angeles, \$1,492. Contract awarded to The Petrol Corporation, Los Angeles, \$1,244.

SAN LUIS OBISPO COUNTY—Additions to be made to existing water and sanitary sewer systems in Arroyo Grand. Dist. V, Rt. 2, Sec. F, B. Peckel, Los Angeles, \$1,997; Santa Maria Construction Co., Santa Maria, \$2,116; Frederickson & Watson Construction Co., Oakland, \$2,306. Contract awarded to Wm. Lane, Paso Robles, \$1,878.

SAN LUIS OBISPO COUNTY—Los Berros Creek to Arroyo Grande 5.8 miles to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. F, Healy-Tibbitts Construction Co., San Francisco, \$282,862; M. J. Bevanda, Stockton, \$270,825; Gist & Bell, Arcadia, \$314,132; Granite Construction Co., Ltd., Watsonville, \$267,617; Clark & Henry Construction Co., San Francisco, \$291,652; C. W. Wood, Stockton, \$267,810; Southern California Roads Co., Los Angeles, \$268,499; Hanrahan Co., San Francisco, \$283,957; Morrison-Knudsen Co., Boise, Idaho, \$273,912; Jahn and Bressal Construction Co., Inc., Los Angeles, \$266,954. Contract awarded to Frederickson & Watson Construction Co., and Frederickson Bros., Oakland, \$264,016.

SAN MATEO AND SANTA CLARA COUNTIES—Between Redwood City and Oregon Avenue, 6.2 miles to be graded and paved with Portland cement concrete. Dist. IV, Rt. 68, Secs. D and A, C. W. Wood, Stockton, \$482,069; Peninsula Paving Co., San Francisco, \$408,360; Healy-Tibbitts Construction Co., San Francisco, \$521,078; Frederickson & Watson Construction Co., and Frederickson Bros., Oakland, \$458,678; N. M. Ball, Porterville, \$473,459; Southern California Roads Co., Los Angeles, \$456,600; Hanrahan Co., San Francisco, \$434,971. Contract awarded to Basich Brothers Construction Co., Torrance, \$405,625.

Highway Commission Holds Meeting and Hears Delegations in San Diego

FOLLOWING its announced policy of holding meetings in various parts of the State whenever circumstances permit and responding to requests from official and civic bodies of San Diego County for the consideration of certain road problems and projects in that section, the California Highway Commission held its regular meeting of October 29th in the city of San Diego. It was the first time the Commissioners have been able to convene outside of Sacramento headquarters since Governor James Rolph, Jr., appointed them to office.

The Commission and members of its legal clerical and engineering staffs were met the preceding afternoon at Del Mar by a reception committee from San Diego headed by Mayor Walter Austin and including Senator William Harper, Supervisors Thomas Hurley and Edward Hastings, Assemblymen Edward Head and George Bowers; County Surveyor Ernest Childs, Frank Forward, chairman of the San Diego Chamber of Commerce Harbor Committee; John L. Fox, director and acting chairman of the Chamber's highway committee, and T. C. Macaulay, manager of the Chamber.

ESCORTED TO CITY

The committee conveyed the greetings of the City and County of San Diego, the Chamber of Commerce and the citizens in general to the Commissioners and escorted them to the U. S. Grant Hotel where the Commission made its headquarters during its stay in San Diego.

That evening the Commission and staff members were guests at a banquet in the San Diego hotel given in their honor by the Chamber of Commerce and attended by prominent San Diegans, city and county officials and local representatives of the State Legislature.

John L. Fox presided and seated with him at the speakers' table were: Chairman Earl Lee Kelly of the Highway Commission, Commissioners Harry A. Hopkins of Taft, Philip A. Stanton of Anaheim, and Frank A. Tetley of Riverside; C. H. Purcell, State Highway Engineer; C. C. Carleton, Chief of the Divi-

sion of Contracts and Rights of Way, State Department of Public Works; District Engineer S. V. Cortelyou, Division of Highways, Los Angeles; District Engineer, E. Q. Sullivan, Division of Highways, San Bernardino; and Russell Bevans, Registrar, Department of Motor Vehicles.

The principal address of the evening was made by Chairman Kelly of the Highway Commission who also conveyed the regrets of Colonel Walter E. Garrison, director of the Department of Public Works, and Commissioner Timothy A. Reardon of San Francisco at their enforced absence—Mr. Reardon through the sudden illness of his wife and Colonel Garrison because of his attendance at the meeting of Western Governors Conference at Portland, Oregon, where Governor Rolph's illness had prevented the latter's appearance among the scheduled speakers.

BIENNIUM PLANS

In his speech Chairman Kelly explained how during the present biennium approximately \$5,000,000 will be spent on roads in the general vicinity of San Diego in carrying out a comprehensive plan for the development and maintenance of highways in that county.

State Highway Engineer Purcell told the assemblage that the Highway Commission is not engaged in a spending orgy but is working on a sound, orderly program of highway development, made possible by gas tax revenues, that will require some years to complete and comprises shortening of routes and changes in the major highway system.

Colonel Ed Fletcher, nestor of highway boosters in San Diego County, called upon to speak from the floor, told of pioneer day efforts to get good road connections between settled sections of the county. He expressed the hope that U. S. Highway 80, starting from the Atlantic coast near Savannah and bringing into San Diego the traffic over U. S. 90 from St. Augustine, Florida, where the Spaniards first landed in America, might be continued by a paved link from San Diego to Point Loma where Cabrillo first landed and planted the Spanish flag on the Pacific coast.

South Bay Chambers Urge Projects

(Continued from preceding page)

The necessity of keeping the gasoline tax money for State highway construction, and the advisability of tree-planting for beautification of highways were among topics discussed by others speakers, including Senator Harper who complimented the Commissioners on their record as "doers."

The regular monthly meeting of the Commission held next day in the Colonial Assembly room of the U. S. Grant Hotel was attended by some seventy-five citizens, officials and delegations from suburban communities.

A delegation from Long Beach headed by R. O. Baldwin, representing the Long Beach Chamber of Commerce presented a request for assistance in financing a link of the State highway through Long Beach.

A Ventura delegation, through D. C. Millan asked cooperation in a project that includes building a by-pass and widening and changing the present highway through that city.

ROUTE TO BORDER

A delegation including representatives of the South Bay Chambers of Commerce from Chula Vista and vicinity was heard on the question of final alignment of the State highway between National City and the border and a proposition for the opening of an old road running easterly by way of Dulzura, Potrero and Campo for a more direct connection with the Imperial Valley highway.

A request that San Diego County be reimbursed for a strip of highway extending 1500 feet north from the international line at San Ysidro being constructed according to State specifications at a cost not to exceed \$25,000, was presented by Chairman E. A. Hornbeck of the county board of supervisors. The Commission agreed to reimburse the county as soon as funds are available.

Supervisor Thomas Hurley explained a proposition for the joint purchase by State and county of the

Coronado Silver Strand for a State park and was informed concerning the procedure for the maintenance of the Strand road as a State highway.

GREETED BY GOVERNOR

After the meeting Chairman Kelly and the Commissioners were entertained by Mr. John Forward at a banquet at Agua Caliente attended by Chamber of Commerce, city, county and State officials, as fellow guests. The occasion was marked by the exchange of felicitations between Mr. Kelly and Governor Lerdo de Tejado, of Baja, California, who dropped in to extend his greetings.

On the following day, Friday, October 30th, the Commissioners inspected the route of the proposed link joining U. S. 80 with the coast at Point Loma and then journeyed some sixty miles east on U. S. 80 to Live Oak Springs to attend formal dedication ceremonies marking the completion of eight miles of paving comprising the last link of the all-paved highway between San Diego and Phoenix.

Hal Hobson, chairman of the National Road Committee of the Chamber of Commerce and manager of the San Diego branch of the Automobile Club of Southern California was chairman, and in attendance were county and Chamber of Commerce officials from San Diego, Imperial, El Centro, Brawley and Calexico.

In the evening Commissioners and staff were entertained by Councilmen J. V. Alexander, J. J. Russo and friends of San Diego.

On their way north next day, the Commission officials were guests of Commissioner and Mrs. Philip Stanton at a barbecue on the Stanton home ranch near Anaheim. More than 150 other guests were present representing a cross-section of distinguished political and social circles of southern California and a tribute to the esteem in which Commissioner and Mrs. Stanton are held by their fellow citizens.

Repairs or Alterations of Dams Approved

(Continued from page 30)

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of October, 1931.

MODOC COUNTY—Lauer Dam No. 128-2. Frank McArthur, Alturas, owner; earthfill, situated on unnamed drainage tributary to North Fork Pit River in Sec. 15, T. 44 N., R. 13 E., M. D. B. and M.

NAPA COUNTY—Lake Marie Dam No. 1-6. Napa State Hospital, Imola, owner; situated on Tulocay Creek tributary to Napa River in Sec. 19, T. 5 N., R. 3 W., M. D. B. and M.

SAN MATEO COUNTY—Burlingame Dam No. 611. California Water Service Company, San Francisco, owner; earth dam, situated on unnamed stream tributary to San Francisco Bay.

SAN JOAQUIN COUNTY—Davis Dam No. 572. Ferroggiaro and Podesta, Linden, owners; earth, situated on Shaw Creek tributary to Calaveras River in Sec. 6, T. 2 N., R. 9 E., M. D. B. and M.

SHASTA COUNTY—False Lake Dam No. 223. O. Merlo, Redding, owner; earth, situated on North Fork

Jenny Creek tributary to Sacramento River in Sec. 4, T. 31 N., R. 5 W., M. D. B. and M.

CONTRA COSTA COUNTY—Black Hills Dam No. 583-2. Mt. Diablo Country Club, Diablo, owner; earth situated on unnamed creek tributary to Green Valley Creek in Sec. 14, T. 1 S., R. 1 W., M. D. B. and M.

SONOMA COUNTY—Lake Ralphine Dam No. 422. Santa Rosa Water Works, Santa Rosa, owner; earth dam.

SHASTA COUNTY—Buckhorn Lake Dam No. 97-86. Pacific Gas and Electric Company, San Francisco, owner; earth, 6 feet above streambed with a storage capacity of 400 acre-feet, situated on North Cow Creek tributary to Sacramento, located in Sec. 19, T. 33 N., R. 2 E., M. D. B. and M. For storage purposes, for power use.

MODOC COUNTY—Big Sage Dam No. 55—Hot Spring Valley Irrigation District, Alturas, owner; earth, situated on Rattlesnake Creek tributary to Pit River in Sec. 1, T. 41 N., R. 13 E., M. D. B. and M.

PLUMAS COUNTY—Grass Lake Dam No. 284. Carnation Gold Mining Company, Blairsden, owner; earth dam, situated on Little Jamison Creek tributary to Jamison, located in Sec. 36, T. 22 N., R. 11 E., M. D. B. and M.



The Division of Water Resources under State Engineer Edward Hyatt has issued the first complete history of California water reclamation districts in a bulletin giving data beginning with the old swamp land fund districts and recording the financial status of present active districts. In the following report are included other important details of flood control, reclamation, dam applications and maintenance work and the news that tests show salinity in the upper Sacramento delta has greatly receded:

The Department of Public Works has released Bulletin No. 37, "Financial and General Data Pertaining to Irrigation, Reclamation and Other Public Districts in California." This bulletin was prepared under the direction of the California Irrigation and Reclamation Financing and Refinancing Commission, created by the Legislature in 1929.

In December, 1930, the commission reported to the Governor on the financial status of irrigation, reclamation and other agricultural districts, with conclusions and recommendations for legislation. Much of the legislation affecting such districts enacted by the 1930-31 Legislature and approved by the Governor, was based on the recommendations of the commission. Bulletin 37 is supplemental to the report to the Governor and records in full the data supporting the conclusions of the commission.

This is the first publication to bring together in complete form data concerning the history, organization and operation of California reclamation districts. The bulletin gives a brief history of all of the reclamation districts, beginning with the old swamp land fund districts, and records the present financial status of the 182 active California reclamation districts, with a brief discussion of the causes leading to the default of some of these districts.

REFUNDING PLANS

Two meetings of the Districts Securities Commission were held during the month, both of which were devoted principally to the consideration of a plan proposed by the Merced Irrigation District for refunding its bond issues amounting to a total of \$16,250,000.

The following districts approved refunding bond issues in special elections.

Nevada Irrigation District, Nevada County.....	\$3,100,000
South San Joaquin Irrigation District, San Joaquin County..	4,791,250
Oakdale Irrigation District, Stanislaus County.....	2,320,000
Grenada Irrigation District, Siskiyou County.....	130,000

The proposal to issue \$93,000 in bonds by the Linden Irrigation District, San Joaquin County, was defeated at a special election, September 26.

DAMS

To date 777 applications have been received for approval of dams built prior to August 14, 1929; 86 applications for approval of plans for construction or enlargement; and 196 applications for repairs.

a. Applications for Approval of Plans for Construction of Dams.

Dam	Owner	County
Bouquet Canyon	City of Los Angeles	Los Angeles
Loosely Pool	T. H. Vestal et al	Lassen
San Gabriel No. 2	L. A. Co. Flood Control Dist.	Los Angeles

Bouquet Canyon Dam is to be a 200' earthfill, storing 36,200 acre-feet for use of the City of Los Angeles water supply.

San Gabriel No. 2 will be a rockfill dam 260 feet high. This is one of several lesser structures to be built in lieu of the proposed San Gabriel No. 1 dam, the site for which was disapproved by the State Engineer as one of his first official actions under the new law governing the supervision of dams, which went into effect in 1929.

b. Applications for Approval of Plans for Repairs or Alterations.

Fifteen such applications have been received during this period, indicating the willingness of owners to place their dams in first-class condition prior to the 1932 run-off season.

c. Nine applications for approval of plans for construction of dams have been approved during the period.

d. Sixteen applications for approval of plans for repairs or alterations of dams have been approved this month.

FLOOD CONTROL AND RECLAMATION

a. Maintenance of Sacramento Flood Control Project.

Routine maintenance work has been continued, including the conditioning of the drainage pumping plants.

Two crews of twenty men each have been started on maintenance clearing operations in the Sutter and Tisdale By-passes. In order to relieve unemployment, these crews are operating on a five day week basis and each man is permitted a total of ten days actual work. These men are registered at the courthouse in Yuba City under the direction of the Board of Supervisors and the men most in need of work are taken on.

Our regular maintenance crew is engaged in repairing the timber breakwater at the junction of the

(Continued on next page)

Water Sought for Hydraulic Mining

(Continued from preceding page)

Sutter and Tisdale By-passes. This consists of renewing certain brace piles and braces at a total cost of about \$900.

The work of clearing and stumping approximately twelve acres in the Sacramento By-pass has been completed.

b. Sacramento Flood Control Maintenance—Bank Protection.

Protective work at the ends of the dam across Hefner Slough on the Feather River at Hamilton Bend has been repaired and additional brush placed to prevent wash. The protective work constructed for Levee District No. 2 of Glenn County two years ago has been put in condition by tightening the cables and lashings holding the logs and brush in place.

c. Sacramento Flood Control Project.

The Reclamation Board has requested this Department to undertake clearing work in the lower part of Sutter By-pass at a cost of \$8,000, under Sec. 21 of Reclamation Board Act. This land will be permanently cleared by placing it in condition for cultivation.

d. Emergency Flood Control and Rectification of Rivers.

Bank protection work on the Mad River on the ranch of John Kane has been completed at a cost of approximately \$1,400.

Arrangements are now being made for the continuation of river rectification work on the San Jacinto River at a cost of about \$6,000, two-thirds of which will be contributed by local interests.

e. Mokelumne River.

Arrangements are being completed with San Joaquin County for a continuation of the work of clearing in the Mokelumne River channel, under Chapter 447, Statutes of 1929. Approximately \$4,500 will be expended for labor on this work.

f. Pajaro River.

Additional work in clearing the channel of the Pajaro River will be undertaken under Chapter 524, Statutes of 1929. The Counties of Santa Cruz and Monterey will each contribute \$1,000, the City of Watsonville \$500, and the State \$2,500, making a total of \$5,000 available for the work, which will commence on October 26.

g. Russian River Jetty.

The construction of the track trestle on the jetty at the mouth of the Russian River has been completed and the quarry and railroad have been in operation dumping stone into the jetty. A derrick having a capacity of twelve tons is now being erected for handling the larger stones to be placed on the south face of the jetty.

h. Flood Measurements and Gages.

The automatic water stage recorders maintained by this office during the winter season are now being placed in order and equipment is being assembled for making flood measurements. It is intended to organize and equip ten parties for this work, ready to go in the field on short notice.

WATER RIGHTS

a. Applications to Appropriate.

During the month of September, 19 applications to appropriate water were received, 21 were rejected and 18 were approved by the issuance of permits. During the same period 10 permits were revoked and 7 licenses were issued finally confirming the rights initiated by the pending permits.

The resumption of interest in hydraulic mining is indicated by 3 major applications filed for the appropriation of water for hydraulic mining. One of these is an application by Buckeye Placer Mines, Inc., to appropriate 15 cubic-feet per second and 500 acre-feet per annum from Little Boulder Creek, tributary to Coffee Creek and Trinity River, at an estimated cost of \$12,500. Another is an application by Arlington Mining Corporation, 740 South Broadway, Los Angeles, to appropriate 0.5 cubic-foot per second from Arrastre Creek, tributary to Mojave Desert, at an estimated cost of \$25,000. Another is an application by Butte Mining Company, 68 Post Street, San Francisco, to appropriate 30 cubic-feet per second from West Branch of El Dorado Creek, tributary to North Fork of Middle Fork of American River, at an estimated cost of \$30,000.

ADJUDICATIONS

North Cow Creek (Shasta County). The North Cow Creek case came up for hearing in the Superior Court of Shasta County on October 13, 1931, and was postponed to October 26, 1931, to allow counsel time in which to file substitutions covering changes in ownership of certain lands involved in the case.

Clover Creek (Shasta County). The Clover Creek case has been set for hearing January 18, 1932, in the Superior Court of Shasta County.

Los Alamos Creek (Santa Barbara County). The decree of the Superior Court of Santa Barbara County adjudicating the water rights on Los Alamos Creek has been entered.

Davis Creek (Modoc County). A tentative decree has been circulated among counsel and is now under consideration by the Superior Court.

Mill Creek (Modoc County). All of the water users have signed the stipulation for consent judgment, and the Report of Referee is now in the course of preparation.

Deep Creek (Modoc County). Distribution of the waters of Deep Creek in accordance with the trial schedule of allotments, adopted for the 1931 season, was terminated on October 1.

Franklin Creek (Modoc County). Administration of the trial schedule of allotments, covering the distribution of the waters of Franklin Creek for the 1931 season, was discontinued on October 1.

New Pine Creek (Modoc County). The field investigation of the water supply and use of water on New Pine Creek was completed on October 1.

Eagle Creek (Modoc County). Field work on the Eagle Creek Investigation was completed October 1.

U. S. Cooperating in Snow Surveys

(Continued from preceding page)

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The irrigation draft on the Sacramento River has continued to decrease until at present there is only a very small amount of late irrigation going on. The flow of the Sacramento River at Sacramento has correspondingly increased and on October 14 this flow amounted to 3600 second-feet. There has been but slight increase in the stream flow at the foothill stations on the rim of the valley.

The salinity in the Upper Sacramento Delta has greatly receded and the tests are showing a drop to three or four parts of chlorine per 100,000 as far down as the vicinity of Ryde. There has been some decrease in the lower Sacramento and San Joaquin Deltas but not in the Upper San Joaquin Delta. At some points in the latter location there has been a continued increase until very recently, indicating a "pocketed" condition of the salt. This results from the condition of very little increased flow to the Delta from the San Joaquin River. Sampling at Freeport, Hood Ferry, Walnut Grove, and Ryde stations in the Sacramento Delta was discontinued during the past month. The regular salinity bulletins to the Delta water users will probably be discontinued at the end of October.

The special field investigation to determine the extent of damage both in the up-river territory and throughout the Delta, due to the 1931 water shortage and salinity, has continued. It is necessary to obtain production and yield figures to complete the data of this investigation and many of these figures will not be available until November or later.

Except for the special damage survey it is planned that all field work will be completed the first of November.

The accompanying tabulations of river discharge and salinity show a comparison between the measurements in September and October of this season and the records in October, 1924.

Station	RIVER DISCHARGE			
	Discharge in Second-feet			
		1931		1924
	Sept.	Oct.	Oct.	
Sacramento River at Butte City	9/9	1790	10/14 2700	10/14 3200
Sacramento River at Colusa	9/9	1620	10/13 2580	10/14 3350
Sacramento River at Knights Landing	9/8	1440	10/12 2650	10/14 3540
Sacramento River at Verona	9/10	2260	10/14 3420	-----
Sacramento River at Sacramento	9/10	2270	10/14 3600	10/14 4940
Feather River at Nicolaus	9/9	333	10/14 546	10/14 1160
American River at H Street Bridge	9/10	103	10/15 168	10/14 140
San Joaquin River near Vernalis	9/11	271	10/9 465	10/14 542
Combined Flow of Sacto River at Sacramento and San Joaquin River near Vernalis	9/10	2540	10/14 4000	10/14 5480

SALINITY—SACRAMENTO-SAN JOAQUIN DELTA

Station	9/10/31 10/10/31 10/10/24		
	Parts of chlorine per 100,000		
O. and A. Ferry	1360	1120	1030
Collinsville	1180	880	915
Three Mile Slough Bridge	840	457	378
Rio Vista Bridge	640	365	124
Isleton	440	114	4
Antioch	1109	875	735
Webb Pump	620	405	223
Central Landing	250	151	75
Middle River R. O.	250	268	178
Clifton Court Ferry	100	125	79
Williams Bridge	80	24	7

CALIFORNIA COOPERATIVE SNOW SURVEYS

The principal activity on this work during the past month has been in the field in contacting the various cooperating agencies and getting all in readiness for the coming season's surveys.

In the Tuolumne and Merced River Basins in Yosemite National Park, arrangements were completed for cooperation between the Park Service, the Merced Irrigation District and the State. New snow survey courses were established, signed, and sketched, at Merced Lake, Moraine Meadow and Johnson Lake in the Merced Basin and at Wolverine Meadow on the Tiltill Trail in the Tuolumne Basin. To accomplish the survey of these new courses, new shelter cabins are under construction at Buck Camp and Camp 11. Arrangements were made for additional survey equipment and for stocking the cabins, etc.

Arrangements were recently completed for a new cooperation with the Forest Service in Sequoia National Forest. Under these arrangements the Forest Service will survey a new route including the Copper Creek Summit, Junction Meadow and Bullfrog Lake courses. To accomplish this, a new cabin is under construction at Glenn Flat on the Bubbs Creek Trail and repairs are being made to the stations at Cedar Grove and Kanawers. On the South Kings route surveyed through cooperation with the Sequoia National Park Service, new shelter cabins have recently been completed on Clover Creek and at Scaffold and Rowell Meadows.

Trips were made to the Mono and Owens basins to complete cooperative arrangements with the South Sierras Power Company and to Markleeville to complete the Mokelumne-Carson survey details.

FEDERAL COOPERATION

In connection with the Federal-State cooperation for irrigation investigations, an inspection was made during the past month of the work being conducted in the Sacramento-San Joaquin Delta. This includes an investigation of the consumptive use of water by Delta crops and by noneconomic vegetation such as tules and aquatic growths, as follows:

- Asparagus Tanks on Richmond-Chase Tract.
- Tule and Cattail Tanks at King Island.
- Tule Tanks at Simmons Island.

Official Bodies Concur in Procedure

(Continued from preceding page)

Tule and Cattail Tanks in Reclamation District 999 near Clarksburg.

WATER RESOURCES

a. South Coastal Basin.

Work in the field continued in a routine way except that methods for analysis of water were changed and it is believed that the change will result in reducing the cost of this work to a considerable extent. Preparations are under way for publication of the first report shortly after January 1, 1932.

b. Santa Ana Flood Control Works.

The first structure on Santa Ana Basin flood control works was approved by the State Engineer during the month. This consists of a rock weir across Cucamonga Creek to divert water to spreading works on Cucamonga Cone. Cucamonga Creek is a tributary of Santa Ana River. The financing of the work is done jointly by the State, the County of San Bernardino and the local interests. The work is to follow the general plans laid out in Bulletin 31, Division of Water Resources, and must be approved by the State Engineer. Plans are under way locally for works of various kinds on the numerous creeks tributary to Santa Ana River and also on the main river.

c. Mohave River.

No field work was done during the year by State forces. Arrangements have been made with the Division of Agricultural Engineering and the Geological Survey, both Federal bureaus, to do the work necessary in the field. This is financed half and half by the government and by the State.

d. Ventura Investigation.

The principal work done during the month was drilling at Spring Creek and Blue Point dam sites, both on Piru Creek. Drilling was stopped at Devil Canyon site which was an alternate to Blue Point, as the showing was quite poor at this site. The remainder of the field work consisted of routine measurements and repair of some of the stream gaging stations.

Arrangements were made with the U. S. Division of Agricultural Engineering to make a determination of rainfall penetration on the valley floor in Ventura County. The experience gathered in other investigations of a like nature will be useful in reducing the cost of this work.

e. Salinas Valley Investigation.

The County of San Luis Obispo and the County of Monterey having deposited money with the State Treasurer which releases State money for the same purpose, under the budget bill, work was begun on a preliminary investigation of the water resources of the Salinas Valley. This investigation will continue for two years and at the end of that time it is hoped sufficient data will have been gathered to determine whether it is desirable to go ahead with a comprehensive program for the valley.

f. Santa Clara Valley Investigation.

At the request of the Santa Clara Valley Water Conservation District, with which the Division is

cooperating in the investigation of water resources matters in Santa Clara Valley, the depth to water was taken in 67 wells during the past month from which it is observed that there has taken place since March 1, 1931, a recession of 19.3' in the general ground water level of the valley.

STATE WATER PLAN

Pursuant to the desire of Governor James Rolph, Jr., the organization of the California Water Resources Commission and the several Honorary Advisory Committees named to deal with the water problems of California, has been attended with energetic activity. Widespread response has been manifested by all the membership of the foregoing groups of public-spirited citizens.

On September 28, a meeting of the California Water Resources Commission was held in the State Building, San Francisco, at which time a report was submitted by a subcommittee presenting a plan of procedure and organization which the Commission therewith adopted. In furtherance with the adopted plan of procedure and organization the California Water Resources Commission recessed to meet jointly with the California Joint Legislative Water Committee and the two bodies were addressed by Governor James Rolph, Jr., who directed emphatic attention to the effectiveness of full cooperation by both official bodies to accomplish prompt action in meeting the water problems of California. Upon the suggestion of Governor Rolph, a resolution was adopted by the combined bodies which commended the passage of the bond issue proposed by the Metropolitan Water District to construct the Colorado River Aqueduct.

BODIES COLLABORATE

Subcommittees were appointed by Chairman Crittenden of the Committee and Chairman Judge Sullivan of the Commission to confer on and arrange a plan of cooperative procedure. The two subcommittees concurred in recommendations that the two bodies collaborate at all times in the fullest practicable manner in accordance with the spirit of the resolutions under which each was created.

On September 29 a general meeting composed of the California Water Resources Commission, the California Joint Legislative Water Committee and the Honorary Advisory Committees appointed by Governor Rolph to cooperate with the California Water Resources Commission, was held at Hotel Oakland.

The Honorary Advisory Committee of Engineers has been requested to review and pass upon the State Water Plan as recommended by the Department of Public Works and to consider any modification thereof and to review any other water conservation plans that might be submitted to them.

The California Water Resources Commission met on October 9 to consider the economic phases of Kennett Reservoir, together with the value of electric energy that could be generated under hydroelectric development and the total probable revenues to be derived therefrom.

Sick Child Inspired Move for Lighting Highway Xmas Trees

THE highways of California will be brightened and at many places during the coming Yuletide season by myriads of outdoor lighted Christmas trees.

The Outdoor Christmas Tree Association of California was organized in 1926 by Clarence F. Pratt of San Francisco and was inspired by a little sick child who sent word to Mr. Pratt how much he enjoyed a tree the latter had lighted up on his front lawn.

The idea spread rapidly and was adopted by other cities as a community project; in some instances whole streets being thus illuminated with rows of lighted trees.

THRONGS OF MOTORISTS

For many years Altadena's mile of lighted Christmas trees has attracted thousands of autoists. Each night during the Christmas week the traffic officers have had to call out boy scouts to assist in handling the crowds. One-way traffic did not entirely clear up the situation.

When Golden Gate Park in San Francisco lighted a mile of its trees it required 25 minutes to drive the mile, although traffic officers tried to keep all cars moving. In Fresno, the Fig Garden Club promoted and lighted a mile of trees on Van Ness Avenue. The mile of lighted trees on The Alameda between San Jose and Santa Clara brings out thousands of motorists.

BRIGHTENS HIGHWAYS

Piedmont, In Alameda County, has lighted a group of trees. The Rotary Club of Gilroy has planned a half mile of Christmas trees on the Hecker Pass highway.

Many other communities and civic organizations are taking a whole-hearted interest in the Outdoor Christmas Tree spirit, which will noticeably dispell the clouds of our so-called winter depression. The northern part of the State as well as the southern part is showing an exceptionally early interest in this very worth-while movement, according to Mr. Pratt, who predicts that in a reasonably short time every California city will have its "mile of Christmas trees" on the highway leading into its city limits.

Teacher: Charlie, what does your father do when he finds anything wrong with his car?
Charlie (truthfully): He bawls Ma out.—*Auburn Journal-Republican*.



PIONEER TREE of the Outdoor Christmas Tree Association is this the fifty-foot cypress on the lawn of Clarence F. Pratt's home in San Francisco. When "Sandy" Pratt lighted it in 1926 a sick child sent word of the joy it gave him and started a movement that has caused the illumination of highway trees all over the state.

ENGINEERS READY

In times like these when general business conditions are lagging, and unemployment is a vexing problem, the engineer stands ready to lead the way out. Not with political nostrums but by planning and carrying out works that will provide the needed employment and leave the community richer and better prepared for the prosperous days to come.

Times are bound to improve. Already there are unmistakable signs of improvement in parts of our country. Not one dollar in doles should be given while there are public improvements of lasting value that can be done. There is scarcely a community in the country where such work can not be found.—*North Dakota Highway Bulletin*.

Twenty-six states now have highway patrols, composed of men whose primary duty is to enforce motor vehicle laws and promote safety on the highways.

Great Crowds Greet Governor on Tour to All County Seats

(Continued from page 4)

"I have come to thank you for your support in the recent election. I have come in good faith—not to seek votes, but to learn your problems first hand. I feel that many sections of the State can not properly present their community matters to a government constantly anchored in Sacramento.

"And so I have brought the government to you; I have come to counsel with you; I am accompanied by several members of my official family, here to discuss with you whatever issues affect their particular departments."

Upon his return to Sacramento Thursday, November 19, the Governor made the following comment to the press on his swing around the State:

"I have seen every mountain, stream, and valley in the State. I have met and talked with thousands of my fellow citizens. I feel that these visits to the county seats of California have done much to enable me better to administer the affairs of the State."

State Employees Nominate Officers

At a recent meeting of Sacramento Chapter of the State Employees Association nominations of officers for the ensuing year and arrangements for the chapter's annual dance were the principal matters discussed. The ticket nominated for election by letter ballot was as follows:

For President

Spencer Burroughs, Division of Water Resources

For Vice President

E. R. Higgins, Department of Public Works

For Second Vice President

Roy Womack, Department of Agriculture

Dan Sullivan, Division of Printing

P. R. Green, District 3, Division of Highways

For Secretary

E. W. Zumwalt, District 10, Division of Highways

For Treasurer

H. B. Weaver, Division of Highways

The date set for the annual dance is Saturday night, January 30, and an arrangements committee was appointed with E. Foster as chairman. Any profits resulting from the dance, it was decided, shall go into a special fund to provide other entertainment programs for Sacramento Chapter.

Rush Hour Traffic Cut 10 Per Cent by "McClintock Shift"

THE RUSH HOUR traffic relief plan recently installed in San Francisco has been made the subject of a bulletin issued by the Alfred Russel Erskine Bureau for Street Traffic Research in Harvard University. This bulletin has been published throughout the country. An excerpt follows:

San Francisco has recently accomplished one of the most fundamental and promising improvements in street traffic ever attempted in any city, according to transportation authorities. For the first time a city has succeeded in materially reducing the severity of the morning and afternoon rush hour demands on traffic and transportation facilities.

These movements, commonly known as peak loads, have long been considered as one of the inevitable evils of city life, resulting in inconvenience to thousands of travelers and in great waste in the maintenance of otherwise surplus equipment.

By the application of the so-called "McClintock shift," the similarity in the hours of retail and other types of business has been broken down and the rush hour flow of traffic has been reduced by more than ten per cent. One hundred and fifty business firms participated in the adjustment.

Ramps, She Wants, For Regaining Hats

State of California,
Division of Highways,
Sacramento, Calif.

Gentlemen:

Please will you run a few ramps off your Yolo causeway? I lost my new fall hat there as irrevocably as in midocean. We looked over—too far to jump—we went on, thinking it might be possible to drive back through the pasture land, but that was not possible, so another hat I had to buy in Redding. I only hope it fell to the lot of a goat—the greenness of it would certainly make its appeal. Ramps for the sake of future travelers!

Sincerely,

GLADYS TROUTMAN,
Monroe, Washington.

Hubby: You're going for a drive with me, aren't you?

Wife: I'm not the person to back out.

Hubby: No, it would be better for the garage if I did.

STATE OF CALIFORNIA

Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

JAMES ROLPH, JR.-----Governor

COLONEL WALTER E. GARRISON-----Director

JAMES I. HERZ-----Deputy Director

DIVISION OF HIGHWAYS

CALIFORNIA HIGHWAY COMMISSION

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 HARRY A. HOPKINS, Taft
 TIMOTHY A. REARDON, San Francisco
 PHILIP A. STANTON, Anaheim
 FRANK A. TETLEY, Riverside
 C. H. PURCELL, State Highway Engineer, Sacramento
 JOHN W. HOWE, Secretary
 HUGH K. McKEVITT, Attorney, San Francisco

HEADQUARTERS STAFF, SACRAMENTO

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 L. V. CAMPBELL, Office Engineer
 T. E. STANTON, Materials and Research Engineer
 FRED J. GRUMM, Engineer of Surveys and Plans
 C. S. POPE, Construction Engineer
 T. H. DENNIS, Maintenance Engineer
 F. W. PANHORST, Acting Bridge Engineer
 R. H. STALNAKER, Equipment Engineer
 E. R. HIGGINS, Comptroller

DISTRICT ENGINEERS

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 H. S. COMLY, District II, Redding
 CHARLES H. WHITMORE, District III, Sacramento
 J. H. SKEGGS, District IV, San Francisco
 L. H. GIBSON, District V, San Luis Obispo
 E. E. WALLACE, District VI, Fresno
 S. V. CORTELYOU, District VII, Los Angeles
 E. Q. SULLIVAN, District VIII, San Bernardino
 F. G. SOMNER, District IX, Bishop
 R. E. PIERCE, District X, Sacramento
 General Headquarters, Public Works Building,
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 J. J. HALEY, Jr., Administrative Assistant
 HAROLD CONKLING, Deputy in Charge Water Rights
 A. D. EDMONSTON, Deputy in Charge Water
 Resources Investigation

R. L. JONES, Deputy in Charge Flood Control and Reclamation

GEORGE W. HAWLEY, Deputy in Charge Dams
 SPENCER BURROUGHS, Attorney
 EVERETT N. BRYAN, Hydraulic Engineer, Water Rights
 A. N. BURCH, Irrigation Investigations
 H. M. STAFFORD, Sacramento-San Joaquin Water Supervisor
 GORDON ZANDER, Adjudication, Water Distribution
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 MABEL PERRYMAN, Secretary

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 J. W. DUTTON, General Superintendent Construction
 W. H. ROCKINGHAM, Mechanical Engineer
 C. A. HENDERLONG, Assistant Mechanical Engineer
 W. M. CALLAHAN, Electrical Engineer

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief
 FRANK B. DURKEE, General Right of Way Agent
 C. R. MONTGOMERY, General Right of Way Agent

DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor
 Port of San Jose—Not appointed
 Port of San Diego—Edwin P. Sample

