

# CALIFORNIA HIGHWAYS and PUBLIC WORKS



*State Highways Pay Daily Dividends  
in Service and Transportation  
savings on the peoples' investment.*

MAY 1932

*Official Journal of*  
**THE DEPARTMENT of PUBLIC WORKS**  
*State of California*

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# \$54,000,000 *Earned By Our Highways*

Joint Traffic Survey by State and Federal Departments Reveals Transportation Savings Returned on People's Capital Investment

This is the first of two articles dealing with the economic value of California's State highway system as represented by the returns on the capital investment in transportation service and savings to the people of the Commonwealth. These articles are based on an exhaustive cooperative survey made by the Federal Bureau of Public Roads and the State Department of Public Works. The second article will appear in the next issue.

By T. H. DENNIS, Maintenance Engineer

**B**ASED on a saving of one and one-quarter cents per mile in reduced fuel and motor vehicle operating costs, California's State highways, up to June 30, 1930, have, after deducting all maintenance, interest and depreciation charges, earned \$54,000,000 on their capital investment. During the same period the safeguarding of this investment through maintenance has cost the motor vehicle operator but one-fourth of the earnings effected in each mile operated.

The above statements are based on the utilization of the State highway system as determined from the joint traffic survey of the Bureau of Public Roads of the United States Department of Agriculture and the State Division of Highways, conducted during the period September, 1929, to October, 1930.

The operating differentials used are those developed in 1926 by the Iowa State College Experimental Station to establish the economic relation between surface type and requisite tractive effort. Differentials in gasoline consumption and tire wear were determined on surfaces ranging from gravel to concrete.

#### COST VARIATIONS

It was found that the costs varied not only with the type of road surface, but with the weight of the vehicle, being higher as the weight increased. For a vehicle weighing 3000 pounds the operating cost per mile

varied as shown on the following surface types:

Concrete	.....	\$0.0175
Bitulithic	.....	0.0212
Macadam	.....	0.0412
Gravel	.....	0.045

The estimated average saving per vehicle mile in operating on the State highway system as improved in 1930, over what it would have cost to operate on the same mileage of unimproved earth or rock surfaced road, is arrived at by applying the cost per mile, as given above to the mileage by kind of surface in the highway system.

The average cost of operation per vehicle mile over the improved portion of the system, works out as \$0.0198 per vehicle mile for the combined high and intermediate types of surface and 0.0284 per vehicle mile for the entire system.

The comparisons for operation over the entire system as well as over the combined high and intermediate types only, are as follows:

	Per vehicle mile
Average cost of operation over an unimproved highway system	\$0.045
Average cost of operation over present highway system	0.0284
Estimated saving	\$0.0166
Average cost of operation over an unimproved highway system	\$0.045
Average cost of operation over the improved portion of the highway system	0.0198
Estimated saving	\$0.0252

(Continued on page 3)



T. H. DENNIS

## Highway Division Plays Large Part in Welcoming Akron to Sunnyvale

**T**HE U. S. NAVY Dirigible Akron, arriving at Sunnyvale Air Base on her maiden voyage to the coast found that the State Department of Public Works through its Division of Highways had taken a leading part in arranging a rousing welcome for her by eager thousands of patriotic Californians.

A newly completed link of the Bayshore Highway running past the southerly side of the air base gave a vast multitude of motorists and pedestrians opportunity for a spectacular view of the great naval airship slowly descending to her anchorage and a close-up of her tremendous bulk as she floated at her mooring mast close to the highway.

This short stretch of modern standard highway, rushed to completion under the supervision of Col. Jno. H. Skeggs, District Engineer, is a link of the Bayshore Highway being built by the State between San Francisco and San Jose. It was designed to accommodate the sightseeing crowds that will visit the great Akron at anchor in her home port. It is 1.2 miles long providing a 60-foot roadway on a 150-foot right of way, ample to eventually provide a 100-foot roadway with parking area along each side. It has been given a temporary light fuel oil surface for immediate traffic needs.

### MAJOR TRAFFIC PROBLEM

The naval officials at Sunnyvale were considerably concerned about the handling of traffic after the dirigible had been anchored at her mooring mast, having had considerable experience with this problem in the East where, they stated, the traffic congestion at the Lakehurst hangar, when the Graf Zeppelin was moored there, had taken three days to untangle.

However, the State Division of Highways had anticipated such a problem and the California Highway Patrol worked out a traffic plan that would permit all machines to pass the air base and view the Akron without serious congestion. The heavy flow of traffic began Friday, May 13th, and continued through Saturday, Sunday and Monday. At times, after dusk, there were seven lines of traffic abreast flowing past the air base.

### 2337 CARS IN HOUR

On Sunday, the Division of Highways took a traffic count which revealed 22,282 automobiles passing the air base in one direction in a 16-hour period, with a peak traffic of 2337 cars in one hour's time.

The very slow movement of vehicles prevented a great number of additional cars from entering the Bayshore highway. These cars were parked along various county roads and private property given over to parking, while their occupants joined thousands of pedestrians standing along the south side of the Bayshore Highway, that being the dead line for pedestrian traffic.

The full benefits of these traffic achievements were apparent at the interesting dedicatory exercises held Saturday afternoon, May 14th, before a temporary speakers' stand erected near the Akron and attended by a vast throng of spectators.

Admiral Cole, Commander of the 12th Naval District told how the Naval Base was established and the great possibilities of a lighter-than-air dirigible which could be placed in civilian passenger traffic as well as naval activities.

### AMAZING POSSIBILITIES

He described how easily the great ship Akron could leave New York and, as she approached Cleveland or Chicago, a small airplane could take on its load of passengers, rise, and contact the Akron at full flight, unload its passengers and then drop from the Akron and return to its local base. The Admiral's description of this particular phase elicited a great cheer from the thousands present.

Lieut. Commander Charles E. Rosendahl, Commander of the Akron, briefly described the entire trip from the Atlantic to the Pacific coast, with all the phases of the flight through storms, to San Diego, and its trip up the California coast to Sunnyvale. He, too, expressed the great possibilities of dirigibles for long commercial flights, especially over seas. Hon. Louis Oneal of San Jose, representing Governor Rolph, briefly described the work of the various chambers of commerce of the San Francisco Bay region

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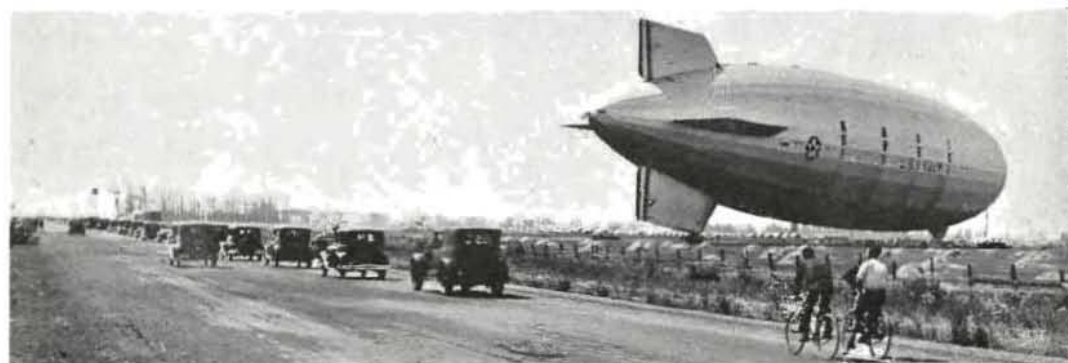




**OUT OF THE MISTS** of the morning the great U. S. Navy Dirigible Akron appeared above the newly completed link of the Bayshore Highway that passes the Air Base at Sunnyvale affording a vantage point for thousands of motorists and pedestrians who gathered in the early dawn to greet her.



**THE PASSING PARADE** that numbered 22,282 automobiles in sixteen hours obtained a spectacular view of the new leviathan of the skies as she lay at her anchorage close to earth just off the wide new highway built to give easy access for thousands of citizens who will visit the ship.



**A CLOSE-UP** picture of the monster dirigible reveals how her huge bulk, 785 feet in length, extends from the mooring mast almost to the new highway where her rudders and elevator fins loom high above the stream of cars. One-way traffic is the rule and the spacious highway permitted autos to roll seven abreast Sunday evening.

# Building Longest Concrete Arch in State Where Bixby Creek Joins Sea

By H. D. STOVER, Designing Engineer, Bridge Department

**E**XHAUSTIVE engineering studies of the Bixby Creek Crossing on Route 56, better known as the Carmel-San Simeon Highway, having been made, plans proposed for the project resolved into a choice of two possible lines of apparent equal cost. One line employed a tunnel eight hundred ninety feet (890 ft.) long, and a bridge some two hundred fifty feet (250 ft.) in length crossing Bixby Creek some distance upstream from the creek mouth. The other line employed a high bridge spanning between the bluffs at the creek mouth.

The latter line was chosen for several reasons—the principal ones being that it made a safer road for the traveling public as well as affording a more scenic route. Thus we have our subject—"The Bixby Creek Arch."

Three thousand years ago and more, before man's intellect conceived the tools with which to construct the complex structures of today, ancient architects and builders made use of the arch as an adjunct in their building. History indicates that, while ancient use of the arch was restricted to architectural embellishment rather than as a structural unit, we may well say the arch is as old as civilization.

## RECORD SIZE ARCH

Today the Division of Highways has under contract the construction of the longest reinforced concrete fixed arch ever undertaken within the State. The structure, to be specific, is located across Bixby Creek approximately eighteen miles south of Carmel.

The exigencies of modern highway construction and the superb grandeur of nature have united at the mouth of Bixby Creek to present a spectacular perspective that will be unexcelled on the Monterey Coast. The curved approaches will tend to display the arch to great advantage in this scenic setting.

The elements of the bridge are one 330-foot open spandrel deck arch span and 9

40-foot deck girder approach spans providing a 24-foot clear roadway at approximately two hundred sixty feet above stream bed.

Other notable reinforced concrete arch spans constructed by the Division of Highways are the Feather River Crossing east of Oroville, consisting of one 270-foot arch span and 4 80-foot arch spans; also the Harlan D. Miller Memorial Bridge in Shasta County, consisting of one 250-foot arch span and 8 24-foot girder spans.

## DIFFICULT JOB

Construction of an arch rib of this great span and high rise is at once a difficult and hazardous construction problem. Conventional practice requires the use of an elaborate timber falsework to support the arch rib forms during the pouring of concrete. In order to take advantage of any possible financial benefit which might accrue through the elimination of falsework construction, the design provided alternative construction methods.

The first alternative provided for arch rib construction in the conventional or usual manner of timber falsework. The second alternative was unique in that the use of falsework was eliminated by the expedient of structural steel arch ribs which would support the form and at the same time provide necessary reinforcing when encased

in concrete. Contractors were required to submit bids on both alternatives, with the State agreeing to accept the lowest bid regardless of which alternative was lowest. The contract was awarded to an engineering company of Oakland, that submitted a low bid of \$203,334 for the alternative requiring falsework for arch rib construction.

I. O. Jahlstrom is Resident Engineer on this project, representing the State.

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H. D. STOVER

Rearing goldfish for the market has developed into a \$1,000,000 industry, according to the Bureau of Fisheries of the Department of Commerce.





**HIGH WIDE AND HANDSOME** will be the 330-foot span made by the open spandrel deck concrete arch of the bridge across Bixby Creek on the Carmel-San Simeon coast highway. The above views show the record-breaking arch under construction.

# Carson Relocation Takes 184 Curves Out of All-Year Route to Yosemite

By E. E. WALLACE, District Engineer

**A**N IMPROVEMENT that will be much appreciated by motorists using the All-Year Highway into Yosemite is secured by the realignment of Route 18, in Mariposa County, from Orange Hill School to Mariposa, known as the Carson relocation.

The new line lies in general about four miles north of the old and traverses a portion of the Mariposa Grant, including the south portion of the Mother Lode, rich in historical lore of the Gold Discovery and the strenuous years immediately following.

The Mariposa Grant, about seventy square miles of cattle range, was purchased by Fremont in 1848 from Juan Alvarado, a one time revolutionary governor of California under Mexican rule. Fremont had commissioned an agent to purchase one of the rich mission farms and was not pleased that his \$3,000 was invested in grazing land of more or less indefinite value and boundaries, with title somewhat clouded.

#### GOLD BROUGHT STRIFE

When gold was discovered on the property, several years later, the elastic boundaries of the Grant and the fact that mineral rights were not conveyed in the title, plunged the vicinity into strife, which lasted many years.

The new highway route crosses the old townsite of Carson, where the ruins of several stone buildings, built during the "49 days," remain as evidence of early mining settlements. Mounds of gravel, turned over several times at different periods in the quest for precious metal, lie on every side.

Agua Fria and Carson creeks show evidence of diversion from their original banks and even today visitors will find prospectors and pleasure seekers panning for the few shining grains that remain in the gravel and sand of the creeks.

Near the new highway location is the townsite of Agua Fria, the first county seat of Mariposa County, which then included most of the San Joaquin Valley south of the Tuolumne. In 1854, the courthouse was moved to Mariposa, where the original building still is in use. Existing roads to the north penetrate the Mother Lode country. The town of Mount Bullion, near the famous Princeton Mine, is still inhabited. Further to the north is Ophir, site of the first mint in California and Bear Valley, which was the residence of the Fremonts on their grant.

#### SHORTENS DISTANCE

As a portion of the All-Year Route to Yosemite, the new highway location will shorten the travel time to this popular National Park. The appeal of the famous valley grows with the years and the added accessibility provided by improved roads. Yosemite Valley was first made known to the world in 1851 when the Mariposa Battalion under the direction of the United States Indian Commissioners traced a resistant Indian tribe to their mountain stronghold. Although the Indians considered themselves secure and were loath to leave their beautiful home

(after somewhat unsatisfactory contact with the miners), the tribe was finally subdued by further expeditions of soldiers.

The first "tourist" visit to the Valley was in 1855, when the yearly total was about thirty visitors and this gradually increased to 147 in 1864 when the region was set apart by Congress "for public use, resort and recreation," under the State of California.

#### PIONEER ROADS

The first attempt at road building with the Yosemite as the objective was in 1856 when a toll trail suitable for horses was constructed. Other trails were built about the same time, but were not financially successful and there-

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E. E. WALLACE





**DEADMAN'S CURVE** is a dangerous point with a blind approach on the present All-Year Yosemite Highway that has taken its toll of traffic accidents. It is one of the reasons for the new Carson relocation.



**HISTORIC RUINS** along the new route include this old store near Agua Fria, largest in the county during the Gold Rush.



**BANDIT DAYS** are recalled by the pioneer store at Mount Bullion, its doors and windows protected by heavy steel.



**BEAUTIFUL BUT TOUGH** for the highway builder are the many deep gulches that add scenic interest and numerous hairpin turns to this existing link on the All-Year route. They are avoided in the new location nearer the stream sources.

## "Men and Equipment Working" Signs Mean Protection to Crews

ONE of the problems in connection with highway maintenance work is the protection of men and equipment as well as the traveling public when it is necessary to make repairs and carry on working operations from the traveled way.

From the workman's point of view many motorists have a reckless disregard for their own safety, and apparently are indifferent to the safety of the men whose duty requires them to keep the road in repair.

This applies particularly to through routes where motorists travel long distances. Almost invariably, on a long trip, a driver strikes a sort of pace before he has gone many miles which he tries to maintain regardless of the fact that his speed should be controlled by visibility, curves, hills, intersections, or city regulations. This characteristic of through traffic makes it hazardous for men working on such roads.

### PROTECTED BY SIGNS

The Maintenance Department of the Division of Highways has standardized the signs and barricades, and every effort is made to have such protective devices uniformly placed and used only when actual work is in progress.

Full benefit of the warning can be secured only if the response of the driver to a given sign is almost automatic. If a sign is in place for which there is no apparent reason, the next time a motorist passes a similar sign his natural reaction is to disregard it. If, instead, he finds that every time he passes a "Men and Equipment Working" sign that he shortly passes the crew, he is immediately more alert.

About a year ago instructions were issued that the "Men at Work" and "Equipment at Work" signs were to be placed on the standard tripod in the middle of the traveled way. It was claimed that traffic gave little attention to the signs if placed out on the shoulders.

It was found that this method developed certain hazards to traffic. The signs were frequently struck and knocked down by passing vehicles and occasionally a vehicle in the opposite lane was thereby endangered. Unless a constant watch was kept by the workmen it was never known if the sign was in place. Likewise, on the hard road surfaces the signs were frequently blown over by the wind. Instructions have been issued accordingly.

### NEW TYPE ADOPTED

A combined sign reading, "Men and Equipment Working" and a new type of stand consisting of an iron pipe upright supported by an 18-inch steel disc has been adopted. A plain plate is provided with each sign so arranged that the words, "And Equipment" may be concealed when the "Men Working" only is desired. The disc type support is not easily blown over and presents less hazard.

On a two lane road the signs are placed at the right hand edge of the traveled way at each end of and not less than 400 feet from the point where operations are under way. On a road having three or more traffic lanes the particular lane being worked on is blocked off by means of a standard wooden barricade, and the sign is placed immediately in front thereof. Each sign support carries a red flag. The signs are to be placed at time of beginning work, removed at noon, replaced at the

## New Official State Map Completed By Water Department

THE official State map which for some months has been in process of compilation by the Division of Water Resources for the Bureau of Publications and Documents of the Department of Finance was completed during March. A newly completed Lambert conformal conic projection was used having its origin at 119° longitude and 37° 30' latitude and the scale is 4 miles to the inch.

Previously existing Federal and State maps generally have paid special attention to legal and political subdivisions without much information as to towns, railroads, highways, etc., whereas the reverse has been true of commercial maps, and most of the maps of both classes were designed to impart information upon a particular subject rather than for use as a base map which would be adapted to the showing of a great variety of data through additions or overprints in color. The new map has been designed to supply this need and will show among other things the following:

Projection Coordinates; State Boundary; County Lines; Rancho Lines; Township Lines; National Forest Boundaries; Indian Reservations; Federal Bird Refuges; Rivers and Creeks; Main Canals; Railroads (Steam and Electric); Cities (Incorporated); County Seats; Towns and Villages; Railroad Stations; Post Offices; Reservoirs above 2000 acre-foot capacity; Lakes and Dry Lake Beds; Principal Mountain Peaks; Principal Points of Coast Line.

### IN FOUR SECTIONS

Original sources of information such as the topographic maps of the U. S. Geological Survey and the topographic and National Forest surveys of the U. S. Forest Service have been drawn upon very largely, thus assuring a more accurate location of township corners than the older records of the U. S. Land Office. Great effort has been made to correct all known errors in previously existing base maps and much care was exercised to place all lettering not only so as to break the line work as little as possible, but also so as to leave the way open for adaptation to special uses by additions or the use of overprints.

The map is produced in four sections identified as the Northern, North Central, South Central, and Southern Sections, each of which is complete in itself or may be matched up for mounting with the remaining sections. The State map in its original scale will have an over all dimension of 12 by 15 feet, but it will readily stand reduction to either 8 or 12 miles to the inch and can be read without great effort on a scale of 16 miles to the inch. On a scale of 8 miles to the inch it will have an over all dimension of 6½ by 7½ feet and on a scale of 12 miles to the inch the over all dimension will be 39 by 43 inches.

Distribution of the map will be handled through the Bureau of Publications and Documents, Department of Finance, to which office requests for copies should be addressed. It is expected that the map will find a widespread demand and that the income from sales will reimburse the State for the cost.

Judge: "You have been found guilty of exceeding the speed limit. Which do you want, ten days or ten dollars?"

The culprit: "I'll take the money please."

*Baugor (Mo.) Daily News.*



# Vehicle Miles Total 9,662,000 Daily

(Continued from page 1)

Since it is our wish to be conservative, we will assume that the savings over the entire system are but  $\frac{2}{3}$  of the calculated differential or one cent, and that similarly the saving due to operating solely on the improved portion of the highway system is  $\frac{1}{2}$  of that shown or  $1\frac{1}{4}$  cents per vehicle mile.

## JOINT SURVEY

The joint cooperative survey by the U. S. Bureau of Public Roads of the Department of Agriculture which was carried on simultaneously in Arizona, California, Colorado, Idaho, Nebraska, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming, was made to obtain essential facts about the present density, type, capacities, and distribution of traffic units as a basis for planning highway development to serve present and future traffic.

Originally it was planned to secure this information for California at some 48 representative stations; this number was later expanded to 130 stations in order to cover the entire State highway system. The utilization thus determined was the aggregate total of miles traveled each day by all motor vehicles on the State highway system. This total, expressed as vehicle miles, amounted to 9,662,000 daily vehicle miles, or 3,526,630,000 yearly vehicle miles, including all state routes.

The evaluation of this aggregate yearly vehicle mileage for 1930 at the differential of one cent,

assumed as applying to the entire system, would mean a saving of \$35,266,300, which is 10 per cent more than the combined highway expenditures for all purposes in that year.

In any business undertaking, public or private, there must first be an outlay of capital. Then, if the enterprise is to be on a sound basis it must earn enough to pay interest on the capital, to pay the operating and fixed charges and to provide for anticipated renewals and replacements. The building and operating of a highway system is a cooperative enterprise of the people of a state, for which they must furnish the capital, and then must pay individually for the use of the facilities. Their profit comes in lowered vehicle operating costs and in more or less intangible benefits.

## TOTAL INVESTMENT

On June 30, 1930, the people of California had a total capital investment of \$172,479,708.08 in their State highways. This amount represents all monies expended in the construction and reconstruction of these roads since their adoption as State highways. The rate and amount of these annual expenditures are shown in the following table from 1912 when the first work began under the 1909 bond issue up to and including 1930, the period covered by the joint survey. This table also shows the aggregate annual sum allowed to cover interest and depreciation on the capital investment during those years.

## ANNUAL CALIFORNIA HIGHWAY EXPENDITURES

Year	Construction	Reconstruction	Maintenance	Administration	Theoretical annual fixed charges* Int. @ 5% plus depreciation 5% (thousands)
1912	\$154,195 12				15
1913	1,329,540 99				148
1914	2,371,873 56				386
1915	6,677,309 41		\$98,355 80	\$101,230 90	1,053
1916	6,065,591 79		834,843 50	218,824 08	1,660
1917	1,883,553 30		804,031 76	46,299 30	1,848
1918	4,484,424 74		703,111 84	100,980 60	2,297
1919	4,843,991 43	\$300 64	1,220,254 07	130,231 84	2,781
1920	7,255,432 15	21,592 28	1,457,912 72	42,581 59	3,509
1921	6,731,048 86	19,201 25	2,167,557 72	226,646 15	4,184
1922	13,967,784 70	18,609 15	3,596,359 53	93,938 04	5,582
1923	14,065,996 51	46,298 08	3,840,738 98	204,937 33	6,994
1924	10,449,932 66	1,836,264 68	3,819,333 59	526,722 83	8,222
1925	7,238,560 34	4,369,895 64	3,655,028 22	857,201 76	9,383
1926	5,147,672 27	6,177,279 68	3,780,470 18	754,271 63	10,516
1927	4,188,410 07	6,815,888 53	5,656,244 73	—269,003 77	11,616
1928	3,506,232 55	7,066,121 67	4,462,993 83	1,269,051 97	12,673
1929	11,816,458 30	8,044,528 28	4,926,454 10	274,259 60	14,659
1930	16,951,153 76	8,934,465 69	6,752,845 54	274,259 61	17,248
	\$129,129,262 51	\$43,350,445 57	\$47,776,536 11	\$4,852,433 46	114,774

\* Calculated on construction and reconstruction.

# \$220,912,500 Savings From 1912 to 1930

(Continued from page 9)

Applying the operating differential of one and one-quarter cents, which was assumed for operating on the improved portion of our highway mileage, to the total aggregate mileage of 17,673,000,000 which resulted solely from operating on the improved portion of the State highway system, the motor vehicle operator up to June 30, 1930, has been saved some \$220,912,500.

The yearly rate of this saving and the miles of improved highway on which it was earned are shown in the following table:

## ANNUAL SAVINGS IN VEHICLE OPERATION ON IMPROVED HIGHWAY

### Covers Only Fuel and Tires

	Miles of improved highway	Annual vehicle miles on improved highways (thousands)	Annual savings at 1.25 cents per vehicle mile
1913.....	44.6	3,000	\$37,500
1914.....	268.0	20,000	250,000
1915.....	754.3	70,000	875,000
1916.....	1050.3	140,000	1,750,000
1917.....	1144.6	200,000	2,500,000
1918.....	1330.7	260,000	3,250,000
1919.....	1523.9	400,000	5,000,000
1920.....	1766.1	530,000	6,625,000
1921.....	2048.4	750,000	9,375,000
1922.....	2458.9	1,100,000	13,750,000
1923.....	2850.9	1,200,000	15,000,000
1924.....	3129.5	1,300,000	16,250,000
1925.....	3310	1,400,000	17,500,000
1926.....	3856	1,400,000	17,500,000
1927.....	3915*	1,600,000	23,750,000
1928.....	3974	2,000,000	25,000,000
1929.....	4059*	2,500,000	31,250,000
1930.....	4118	2,500,000	31,250,000
		17,673,000	\$220,912,500

\*Prorated for biennium.

A summary of the above tabulations justifies the following conservative estimate, in round figures:

Savings by the public in decreased costs for fuel and tires on improved portions only.....	\$221,000,000
Operating expense—	
Maintenance and administration (on entire system).....	\$53,000,000
Depreciation (5% annually on capital investment).....	57,000,000
Interest on investment at 5%.....	57,000,000
	167,000,000
Net savings.....	\$54,000,000
Total capital investment.....	\$172,000,000
Less depreciation.....	57,000,000
Total net value of investment as of June 30, 1930.....	\$115,000,000

On the basis of the depreciation charged, the net value of the investment is \$115,000,000. Unquestion-

ably, a highway system is as subject to depreciation as a manufacturing plant. However, the loss is not certain enough to be readily calculable. Physical deterioration is a question whose ultimate decision rests only in exhaustive investigation.

### CONSERVATIVE FIGURE

The rate of depreciation charged, 5 per cent, is equivalent to allowing a life of only 20 years. For highway purposes this rate is probably the maximum. For such costly items as right of way, grading, and drainage have an enduring worth. The statement of a present value of \$115,000,000 is therefore regarded as ultra-conservative.

The investment of \$172,000,000 in California's State highway system has therefore profited its motor vehicle users alone some \$54,000,000, after allowing for operating expense, interest on the investment and depreciation. On the basis of the savings shown the total cost of maintenance on the entire system has been but one-fourth of the returns realized through operation solely on the improved portion of the highways. Furthermore, these returns will increase yearly, being limited only by the amount of traffic using these roads.

The area of the 11 western states included in the joint survey conducted by the United States Bureau of Public Roads represents more than 37 per cent of the area of the United States and more than 35,000 miles of federal aid highways. It was found that the aggregate total daily utilization of the respective state highways by all vehicles, was 23,062,000 daily vehicle miles or 8,400,000,000 yearly vehicle miles. Of this total 7,500,000,000 were passenger car miles and 900,000,000 were truck miles.

Approximately 15 per cent of the total or 1,200,000,000 vehicle miles represented travel by foreign or out of state vehicles. Since the total vehicle miles expresses the general degree to which the roads are used, California with 36.6 per cent of the total aggregate daily vehicle miles shows the greatest highway usage.

### HEAVY TRAFFIC AREAS

The heaviest traffic naturally was recorded on the State highway routes near Los Angeles and San Francisco. The stations used to determine the volume were selected to give, as nearly as possible, the normal average traffic on each route, but of necessity the station locations near one city did not have the same relative locations as those near another city.

The area bounded by the stations near Los Angeles included Pasadena, Hollywood, San Fernando and Santa Monica, as well as Los Angeles. The volume of traffic is shown for six important highways serving this area—U. S. 101 leading east and south from Los Angeles to Whittier, Fullerton, and San Diego; U. S. 101 west from Hollywood toward Ventura and Santa Barbara; U. S. 99 north from San Fernando to Bakersfield; U. S. 66 east from Pasadena to San Bernardino; the State route northeast from San Fernando to Lancaster and Mojave and the State route northwest out of Santa Monica to Ventura.

The most heavily traveled of these routes is U. S. 101 to the east and south with a total volume of traffic between Los Angeles and Whittier of 17,805 vehicles per day, of which 1008 are light trucks of

(Continued on page 12)





**BUSY HIGHWAYS**, these, returning daily dividends to the people in service and transportation savings. No. 1, week-day traffic using the lanes on the Bayshore Highway at South San Francisco. No. 2 shows U. S. 40 out of Sacramento. No. 3, trucking oil on U. S. 99 near Turlock. No. 4, hauling on Red Bluff-Susanville highway. No. 5, on Grapevine Grade, Ridge Route. No. 6, on Peninsular highway, San Bruno. No. 7, scene on Coast Route north of Santa Monica. No. 8, U. S. 99 near Newhall. No. 9, Placerville-Tahoe highway.

## State Shows Greatest Highway Usage

(Continued from page 10)

less than 3-ton capacity and 360 are heavy trucks of 3-ton capacity or greater.

### LARGE TOTAL VOLUME

U. S. 101 to the west and north and U. S. 66 to the east also carry large volumes of traffic, the daily average volume on U. S. 101 east near the city limits of Hollywood being 6009 vehicles and that on U. S. 66 east of Pasadena being 8502 vehicles. The total volume on the six routes is 45,588 vehicles per day, an average of 7598 per route.

The San Francisco area includes San Francisco, Sausalito, and the east bay cities of Richmond, Oakland, Alameda, Berkeley and Hayward. The principal routes serving this area are U. S. 101 north from Sausalito toward Santa Rosa, the State route south from Hayward toward San Jose, U. S. 101 south from San Francisco to San Jose, the State routes known as the Bay Shore and the Skyline Boulevard south out of San Francisco, U. S. 40 north from Richmond toward Sacramento and U. S. 50 east from Hayward to Stockton.

The greatest volume of traffic occurs on U. S. 101, the main highway leading south from San Francisco, an average of 11,643 vehicles per day flowing on the section just south of the city near Lawndale. The volume of truck traffic at this point is also heavy, the daily average being 558 light trucks and 102 heavy trucks.

Next in importance is U. S. 40, the daily average north of Richmond being 7815 vehicles. While the total traffic on U. S. 50 to Stockton is slightly less than that on U. S. 40, it is significant that the volume of trucking on this route is greater, averaging 415 light trucks per day and 257 heavy trucks. This volume of trucking is practically equaled on the route

between Oakland and San Jose, but the proportion of heavy trucks is greater on U. S. 50, clearly establishing its importance as a commercial route. The total volume of traffic on the routes entering the San Francisco area averages 46,234 vehicles per day or 6605 per route, somewhat less than the volume of traffic in the Los Angeles area.

### PREDICTIONS FOR 1935-40

The joint survey determined that in 1930 California had 50.8 per cent of the total motor vehicle registration of the 11 western states, and consumed 52.2 per cent of their total recorded gasoline consumption. Their predictions, based on the data gathered for California registration and gasoline consumption at the end of 1935 and 1940 respectively, are as follows:

	1925	Per cent increase over 1930
Registration -----	2,520,000	23.5
Gas consumption ---- 1,523,000,000 gals.		31
	1940	Per cent increase over 1930
Registration -----	2,900,000	42.1
Gas consumption ---- 1,800,000,000 gals.		54.9

The results of this survey should prove beneficial in acquainting California with the worth of her highway investment. The fact that reconstruction is somewhat behind the calculated depreciation is another point inviting interest, if we desire to keep abreast of the traffic demands forecast by the joint survey, and continue to realize further returns on this investment.

## C. R. Montgomery Joins Ranks of Benedicts

Clifford R. Montgomery, attorney and general right of way agent for the Department of Public Works at headquarters in Sacramento, was married in St. James Episcopal Church, Los Angeles, May 22, to Miss Margaret Brandt.

The bride is a daughter of Dr. and Mrs. F. A. Brandt of Los Angeles. She is a graduate of the University of California at Los Angeles and a member of the Delta Gamma sorority.

Mr. Montgomery is the son of Mr. and Mrs. John S. Montgomery of Lodi, and a graduate of Stanford where he received his J.D. degree in 1930. He is a member of Beta Theta Pi, Phi Beta Kappa, Phi Delta Phi and Order of the Coif. He was connected with a large law firm in Los Angeles before becoming associated with the legal department of the Division of Highways last year.

## Highways in U. S. Now Total 223,000 Miles

Federal Aid Highway construction mileage has increased from 169,000 in 1923 to 199,000 at the present time in the United States, it is noted in a report reaching the Automobile Club of Southern California. In 1923 the roads composing the highway systems of the states which also include the Federal Aid system, totaled 203,000 miles, and now the total is about 120,000 greater.

Much of this additional mileage on the state systems consists of roads taken over from counties and townships.

At the peak of the road-building season there were 155,000 men engaged in the construction of Federal-Aid highways, according to government reports.

A new driver writes in to ask what stops a car skidding.

Well, usually it's another car or a conveniently placed telegraph pole.—*Motor Loud.*



## Getting at the Core of Pavements for Laboratory Analysis

**I**T IS the practice of the California Division of Highways to cut cores from the finished pavement whenever it is desired to test the work for strength and thickness, and also in order to show how thoroughly the concrete was mixed and placed at the time of laying.

In this way records can not only be secured of the quality of the pavement at the



**SAMPLING HIGHWAYS** is the job of Art Savage. With this truck and trailer equipped with a power drill he takes pavement cores five inches in diameter for tests by State engineers.

time it is completed but also test analysis can be made at greater ages in order to secure information as to how any particular type of construction is standing up with age.

Cores were recently cut in the San Joaquin Valley from concrete pavement which was constructed 20 years ago in 1912.

The outfit used for the purpose cuts a cylindrical core approximately five inches in diameter, using a section of 5-inch pipe for the cutting tool and crushed steel or chilled steel shot as an abrasive. The crushed steel which generally comes in finer particles than the steel shot cuts a core with a much

### GOOD BUSINESS TO KEEP GOING IN 1932

Stabilization of highway programs and income are absolutely essential to the orderly progress of highway transportation.

It is certainly good business to continue road improvement at a steady pace during 1932, while the road dollar will buy more construction value than ever before and probably more than it will buy for many years to come.

Road building has not only aided the industries directly engaged in construction, materials and machinery but it has increased the value of motor vehicles, sustaining the automobile and truck industry.—*American Road Builder.*

### "MEN AND EQUIPMENT WORKING" SIGNS MEAN PROTECTION TO CREWS

(Continued from page 8)

end of the noon hour, and removed at the end of the day's work.

When trucks or tractors are engaged in pulling graders over considerable distances a sign is placed at the edge of the traveled way at the beginning and end of the section being worked over.

#### RED FLAG CODE

Particular stress is laid on the importance of spotting working equipment in such positions as will create the least traffic hazard. Each piece of equipment is equipped with a red flag front and rear.

Flagmen are employed wherever power shovels or trucks are operating in the traveled way at locations with restricted view, or wherever traffic is restricted. Red flags are used only in slowing down or stopping traffic. When traffic is signaled to go the flag is held behind the flagman's back and the advance signal given with the free arm and hand.

On certain sections of mountain road where a single piece of grading equipment may operate over a long distance, where it would be impractical to place and remove the temporary sign daily, a large sign reading as follows is placed at appropriate points: Grading Equipment Working Next (-----) Miles. 7.30 A.M. to 4 P.M. Excepting Sundays and Holidays.

smoother and neater surface than the steel shot.

Where the rock in the concrete pavement is extremely hard and tough it takes from 30 to 60 minutes to cut a core from a pavement five to six inches thick. Where the concrete has been constructed from gravel which consists largely of indurated sandstone only about 10 to 15 minutes is required to cut the same thickness of core.

The cores are tested for compressive strength by crushing at the laboratory, using the large laboratory compression machines for the purpose.

## "Follow the Leader" Traffic Control Plan Effective in Oiling Operations

By W. A. SMITH Assistant Maintenance Engineer

**I**N THE early days of the use of light asphaltic oils as dust palliatives, the practice was almost abandoned due to hundreds of complaints from the traveling public. No particular provision was made to protect traffic, and when a machine passed over a freshly oiled section of road it was covered with oil, and an expensive washing job was necessary. Likewise the clothes and features of the occupants of the car were apt to be in the same condition.

Efforts to control the matter were tried first by placing numerous warning signs, and by stationing a flagman at each end of the job. He was provided with printed cards to hand out. The cards requested that the motorist drive slowly through the oiled section. This method might have worked successfully, except for the occasional thoughtless or reckless individual who drove out on the fresh oil at high speed and spattered each car as he passed.

### CONTROL ESTABLISHED

Determined to effectively control this situation, the Maintenance Department of the Division of Highways developed a system of passing traffic through oiling operations under one-way control. The system is as follows:

Before oiling is started a barricade is erected at each end of the section of road to be controlled. In general the barricades are not more than three miles apart, to limit the period traffic will have to wait. A large painted wooden sign advising the motorist as to conditions is placed at each barricade, and smaller pasteboard "Caution" signs are placed at frequent intervals within the barricaded portion. A flagman is stationed at each barricade, and a pilot car with driver is provided to conduct traffic through the work. This car carries a sign on the rear which reads "Follow but do not pass this car."

Oil is spread and covered on one side of the road at a time, leaving the other half for traffic.

### HOW PLAN WORKS

When oiling starts the flagman at one end holds up traffic while the pilot car conducts a line of cars through the work from the other end. A red flag is handed to the driver of the last car in the line for delivery to the flagman at the far control. When the control is reached the travelers go serenely on their way, and the pilot turns about and conducts another convoy to the starting point.

After one side of the road has been oiled and covered so there is no possibility of picking up oil, traffic is transferred to that side, and the other half is then treated.

If an impatient driver insists on passing the control car over the fresh oil between control points, his number is taken and record is made of the circumstances. Excellent cooperation has been received from traffic officers, who make it a point to visit the controls at frequent intervals. Several instances of citation and fining of drivers who disregarded the control regulations have materially assisted in educating the more reckless.



W. A. SMITH

### LITTLE TIME LOST

The advantage of the pilot control is in regulating the speed and in keeping traffic in a single compact line. If oil runs across into the lane of travel, the control car holds up traffic until the fresh oil can be covered. Likewise if a spreader truck or other equipment is working or turning, traffic is stopped until it can pass without being spattered with oil, and without danger. In order to keep delays to a minimum the barricades are moved up as soon as conditions justify. In general a control period of about ten minutes is all the time lost by traffic.



## Warrant Brings Bridge Chief to Dedication

In the course of his official duties, F. W. Panhorst, Acting Bridge Engineer of the Department of Public Works, has occasionally been summoned to court on civil matters but his first experience of being "haled" under a warrant for a criminal offense came in connection with the recent dedication of the Napa Bridge.

A few days before that event Mr. Panhorst visited Napa for final inspection of the bridge and some matter arose in which the cooperation of the fire department was desirable. A night visit to headquarters was necessary to see Fire Chief C. F. Otterson. In company with J. Kenny, superintendent for the bridge contractor, Mr. Panhorst went there and found everything dark and locked up. Someone set off the fire alarm and out rushed the chief pulling on his apparel, ready for action and mad as a hornet when he learned it was a false alarm.

The atmosphere was soon cleared by explanation and smiles and in parting the chief asked Panhorst if he would see him again at the dedication exercises. Panhorst regretted he couldn't possibly make it.

A day prior to the gala event Panhorst was served with a warrant sworn out by Otterson charging him with violation of the law by "tampering with a fire alarm" and ordered to appear in court on the morning of the bridge dedication under penalty of going to jail or paying a large fine.

Panhorst duly presented himself and was sentenced to attend all the dedication functions which he agreed to do to the accompaniment of more smiles, mostly by Otterson and Judge A. C. Handel.

The cost of handling traffic by this means is considerable during an oiling season, but the benefits far outweigh the cost. The cost of washing and polishing a few machines, to say nothing of damage to oil-spattered clothing, and loss of pleasure in the trip, are items not to be neglected.

Since the inauguration of the control system practically no complaints have been received. The proper handling of traffic has become as much a part of the work as is the arrangement for material for the job.

In the smoking room of the big hotel the Scot had been boring everyone with tales of the great deeds he had done.

"Well, now," said an Englishman at last, "suppose you tell us something you can't do, and by jove, I'll undertake to do it myself."

"Thank ye," replied the Scot. "I canna pay my bill here."—*Borrow Pit.*

The watchman testifying on the stand told about the most graphic story possible in one sentence when he was asked by the lawyer what he said when he saw the automobile approaching.

"I said," was the answer "that is a fine car,—wasn't it?"—*Arizona Highways.*



## Sixteen Major Projects in Highway Program Advertised During Month

**C**OLONEL Walter E. Garrison, Director of the Department of Public Works, announced that during the month of May the Division of Highways planned to advertise sixteen major projects, for construction on State highways, at an estimated cost of more than \$2,600,000.

These projects include ten road jobs and six bridges. The road projects cover work on some 71 miles of State highway, amounting to approximately \$1,874,000, and the proposed bridges are estimated to cost about \$730,000. The work is distributed well over the State from San Diego to Siskiyou counties and involves work in fourteen counties.

The following summary and brief descriptions of projects planned for advertising during the month show the scope of the proposed work which will carry forward the 1932 State highway construction program:

In Contra Costa County an important improvement is to be made to the State highway, which leads from the San Francisco Bay area to the Napa and Sacramento valleys via the Carquinez Bridge, between the town of San Pablo and the bridge. This project will involve the placing of a new 30-foot pavement over the entire distance with the exception of some 1100 feet in the business section of the town of Pinole, which was paved with Portland cement concrete pavement some three years ago.

### MAJOR LINE CHANGES

Much of the existing alignment and grade will be greatly improved and two major line changes are included. One of these major changes involves the relocation of the highway within the town of San Pablo and up the slopes of the first range of hills. The other radical change in alignment lies between Hercules and Rodeo; the new routing leaves the existing road at Refugio Creek and cuts through the Hercules Powder Farm to the town of Rodeo in a nearly straight line.

This second major line change saves more than one mile in distance over the present location and will provide a full 30-foot pavement with a 46-foot roadbed. The pavement will be asphalt concrete throughout, except

on the steeper grades where Portland cement concrete pavement will be used. It will eliminate all rough pavement, high crown and excessive superelevation on curves between the northerly end of San Pablo Avenue and the Carquinez Bridge.

A project of great interest to thousands of southern California motorists will be put under way when work is begun on the easterly end of the new Pomona-Los Angeles Lateral. This new highway is one of the important secondary roads in southern California incorporated in the State highway system by the 1931 Legislature.

### CONTINUES IMPROVEMENT

In the construction of this new thoroughfare the State will carry forward the work which has been started by the Los Angeles County Road Department. The surveys made by the county have met with the standards of the Division of Highways and the plans for the present project have been prepared by the State on the basis of the county's preliminary work.

The project proposed for advertising this month involves construction on this new route over the six miles westerly of Pomona. The new highway will consist of a Portland cement concrete pavement 30 feet wide on a graded roadbed, 50 and 80 feet wide. The standards of alignment, grade and construction will meet the modern requirements for suburban boulevards and will provide this section of southern California with an excellent high-speed lateral.

Where the Pacific Highway crosses Cottonwood Creek in Siskiyou County about 21 miles north of Yreka, the new 120-foot reinforced concrete bridge has just been completed and the construction of the approaches is now to be started. The approaches will be about 0.8 of a mile in length and follow the improved alignment upon which the new bridge was placed. The new approaches will consist of a graded roadbed 31 feet wide surfaced with untreated crushed rock 22 feet wide with a bituminous treated crushed rock wearing course 20 feet in width.

This improvement to this interstate arterial, which carries the bulk of traffic between

(Continued on page 30)

## *Work Advanced to Bids in May*

The schedule of projects proposed by the Division of Highways to be advertised for bids prior to June 1, 1932, included sixteen major improvements in fourteen counties at an estimated total cost of approximately \$2,604,950. The proposed work covered some 71 miles of road surfacing and paving and six bridges as follows:

### DETAILED LIST OF PROJECTS

County	Location	Miles	Type
Ventura	Montalvo to Oxnard	2.4	A. C. & P. C. C. P.
Contra Costa	San Pablo to Carquinez Bridge	10.6	A. C. & P. C. C. P.
Yolo	Swingle to Yolo Causeway	1.7	P. C. C. Pave.
Los Angeles	Barranca St. to Pomona	6.0	P. C. C. Pave.
Del Norte	Crescent City to Madrona Camp	6.9	Bit. Tr. Cr. Rk. S.
San Luis Obispo	Cambria to San Simeon	9.7	Bit. Tr. Cr. Rk. S.
San Bernardino	Halloran Summit to Moun- tain Pass	16.5	Bit. Tr. Cr. Rk. S.
Sacramento	McConnell to Sacramento	11.9	Bit. Tr. Cr. Rk. B.
Siskiyou	At Cottonwood Creek	0.8	Bit. Tr. Cr. Rk. S.
Amador	Drytown to Martell	4.8	Bit. Tr. Cr. Rk. S.
San Luis Obispo	Across San Simeon Creek	---	2 Steel & Conc. Br.
Monterey	Across Wild Cat Creek	---	Stone faced arch B.
San Joaquin- Stanislaus	Across Stanislaus River	---	Conc. & Steel Br.
San Joaquin	Across Paradise Cut	---	Steel Stringer Br.
Ventura	Across Ventura River	---	R. C. Girder Br.
San Diego	Sorrento Canyon Overpass	---	R. C. Girder Over- head

### SUMMARY

Type	Miles	Amount
Portland Cement Concrete Pavement.....	10.8	\$1,017,900
Asphalt Concrete Pavement.....	9.9	
Bituminous Treated Crushed Rock Surfacing....	50.6	856,200
Bridges .....	(6)	730,850
<b>Totals .....</b>	<b>71.3</b>	<b>\$2,604,950</b>



# Highway Tunnel Under Railroad and Town at Newcastle Opened to Traffic

By CHARLES H. WHITMORE, District Engineer

**T**HE LAST two years have realized the elimination of the poorly aligned highway with excessive and adverse grades by the reconstruction of a portion of the Primary State Highway System in Placer County between one-half mile west of Newcastle and Auburn.

This unit of improvement is a portion of the main transcontinental route, "Victory Highway," United States Route 40, State of California Route 37, situated in the foothills of the Sierra Nevada Mountains in the rich fruit regions of Placer County.

The new highway, 4.1 miles in length, is 1520 feet shorter than the old road and is paved with Portland cement concrete on a thirty-six-foot graded roadbed. The new alignment consists of long tangents with a fifteen hundred-foot minimum radius curve as compared to a fifty-foot minimum radius curve on the old road. The new road uses a maximum grade of 5.68 per cent as compared to a maximum 8 per cent on the old road

## TUNNEL UNDER TOWN

A special feature of this improvement is the construction of a highway tunnel underneath the main east-west lines of the Southern Pacific Railroad and a portion of the town of Newcastle. The parabolic arch tunnel is five hundred thirty-one feet long and has a vertical clearance of twenty feet nine inches at the center line of the roadbed.

The tunnel is lined throughout with reinforced Portland cement concrete fourteen inches thick at the top, increasing to twenty-four inches at a point five feet above the pavement, thence increasing to about four feet at the base. Through the tunnel and approach cuts at both ends, the roadbed is thirty-six feet wide providing a pavement thirty feet wide with pedestrian sidewalks and curbs three feet wide on each side. Contigu-

ous to the thirty-foot-pavement, the pavement is twenty feet wide.

The elevation of the pavement in the tunnel is about eighty-six feet below the grade of the railroad tracks.

The driving, lining, painting, lighting, etc., of the tunnel was executed at a cost of \$130,000. The pavement, concrete sidewalks and curbs approaching and through the tunnel were constructed at a cost of approximately 46,000.

The reconstruction between one-half mile west of Newcastle and Auburn was performed under four separate contracts financed from the State Highway Reconstruction Fund for the 81st, 82d, 83d, and 84th Fiscal Years at a cost of approximately \$560,000.

The first portion of reconstruction consisted of one and two-tenths miles of grading, between one-half mile west of Newcastle and one-half mile east thereof, including driving and lining the tunnel. The second contract was for the construction of a timber bridge at Auburn Ravine one-half mile west of Auburn. J. W. Trask was Resident Engineer on both contracts.

The third contract embraced one and thirty-five hundredths (1.35) miles of grading and Portland cement concrete pavement between Wise Power House and Auburn and the fourth contract was two and seven-tenths miles in length, consisting of grading and Portland cement concrete pavement between one-half mile west of Newcastle and Wise Power House, with W. G. Tinney Resident Engineer on both contracts. (This mileage includes the 1.2 miles of the first contract.)

The first work was started September 2, 1930. The completed paving was opened to public travel on May 14, 1932.

The surveys, designs, estimates, plans, specifications, and construction were under the administration of Charles H. Whitmore.



C. H. WHITMORE





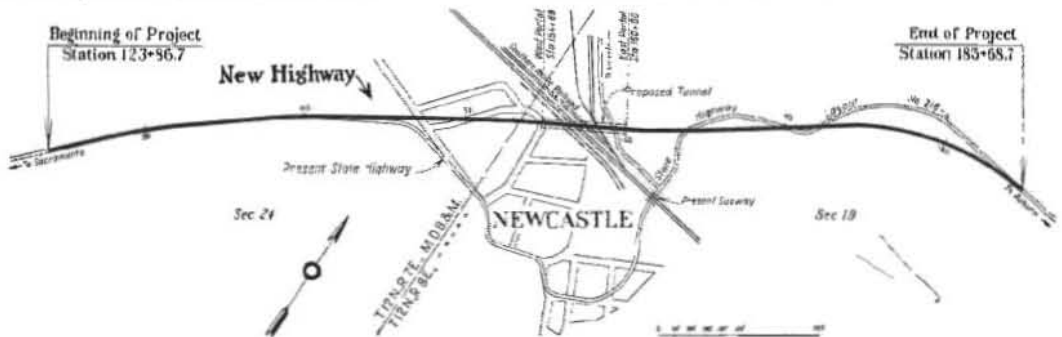
UNDER THE TOP, goes the new highway through Newcastle via the recently completed tunnel beneath the town and railroad. The old route up over the hill is seen on the left.



BROAD AND SMOOTH is the way now through the west portal of the Newcastle bore.



TIME AND MONEY saving to motorists are evidenced by this view from the East portal.



Map showing direct routing through Newcastle by new tunnel.

# Master Plan of New State Hospital in South Provides for 5000 Patients

By **GEORGE B. McDOUGALL**, A. I. A., State Architect

ON APRIL 29, 1932, the Site Commission composed of Dr. J. M. Toner, Director of Institutions, Chairman; Colonel Walter E. Garrison, Director of Public Works; Rolland A. Vandegrift, Director of Finance; Mrs. Carrie Parsons Bryant of Los Angeles and Herman Michel of Santa Monica selected a site known as the Lewis Ranch for the new State hospital for insane to be established in southern California.

This site consists of about 1500 acres and is located in Ventura County about two miles from the town of Camarillo on the Coast highway which is about 17 miles south of Ventura and about 56 miles north of Los Angeles. The site is about 5 miles from the ocean measured on a straight line.

There is abundant water of good quality, the soil is good and the climate is cool in summer and mild in winter. There is an ample area of farming land.

#### PICTURESQUE SETTING

The natural contours of the building site itself and the relation to it of the surrounding hills are such as to provide an unusually picturesque setting for the buildings which will be located on rising ground and will be approached from the entrance lying on somewhat lower ground. These hills besides adding to the picturesqueness of the building group will provide effective protection against such winds and fogs as usually occur along the coast.

While the farming lands will be comparatively close to the building site the building group itself with its lawns, gardens and foliage will nevertheless be isolated by the surrounding hills.

The dairy, piggery and poultry activities will be entirely separate from the main institution.

Since the new institution will be a part of the State Department of Institutions, its development on the selected site will be cared for under the direction of that department. The Division of Architecture of the Department of Public Works will care for the architectural and engineering work involved in the design and construction of the buildings and other structures required.

#### TENTATIVE BUDGET

After deducting the cost of the site there remains available for construction purposes the sum of about \$1,030,000 for the expenditure of which the following is a tentative budget:

1. Unit for 400 patients	\$350,000
2. Unit for 400 patients	350,000
3. Employees quarters and garages	100,000
4. Commissary storage	15,000
5. Main entrance road	25,000
6. Sewage disposal plant first unit	50,000
7. Sewage collection	10,000
8. Domestic water development and distribution	25,000
9. Gas service	7,000
10. Electric service and telephone	10,000
11. Roads, walks, sprinkling systems and landscaping	25,000
12. Reserve	63,000
<b>Total</b>	<b>\$1,030,000</b>



**GEORGE B. McDOUGALL**

This expenditure, work under which it is expected will be started during the late summer or early fall of 1932, will provide living quarters for 800 patients and for the necessary employees to care for them.

Due to the availability of low-cost natural gas there will be no central heating plant, each of the buildings will be self-contained as to heat generation.

#### FUTURE NEEDS

Future needs to be provided for by the 1933 and later Legislatures will include besides additional units for patients, the following essential accessory projects and buildings:

# Ten Year Hospital Building Program

(Continued from preceding page)

1. Flood control .....	\$40,000
2. Main entrance bridge.....	25,000
3. Building to contain kitchen, three dining rooms, bakery and refrigeration.....	100,000
4. Administration Building with temporary quarters for Superintendent and As- sistant Superintendent .....	50,000
5. Laundry building and equipment.....	50,000
6. Farm group .....	75,000
(Dairy, piggery, poultry, horse barn, implement storage and blacksmith shop)	
7. Fire protection .....	10,000
8. Industrial buildings .....	50,000
9. Superintendent's residence.....	30,000
10. Two cottages with garages for Assistant Physicians .....	25,000
11. Manor House for unmarried employees.....	35,000
12. Receiving and hospital building.....	200,000
13. Assembly Hall .....	100,000
14. School and gymnasium.....	75,000
15. Recreation building for employees.....	50,000
<b>Total.....</b>	<b>\$915,000</b>

Since it is intended that the institution shall ultimately have capacity for 5000 patients, the cost of additional units for patients and of other buildings required added to the approximate figure of \$2,000,000 for the items above listed would bring the probable ultimate cost of the institution for construction only, to approximately \$7,000,000.

## TEN YEAR PROGRAM

This total expenditure in accordance with the State's policy of caring for such development out of current funds will probably be made under a building construction program extending over a period of approximately ten years.

The master plan to determine the ultimate development of the institution is now being made on the basis of an ultimate patient capacity of 5000 as already stated. The area of the building site is such as to permit of an increase of this number to 6500 or 7000 should this be found desirable at any time in the future.

The structures for patients are being laid out partly in accordance with the plan of two two-story units just completed at the Agnews State Hospital Farm near San Francisco and partly in accordance with a one-story unit recently completed at the Patton State Hospital near San Bernardino. There will be ample provision for the more infirm patients in the one-story structures giving these patients the easiest possible access into and out of the buildings. This will give them the benefit of being in the open as much of the time as practicable.

## MASTER PLAN

The exterior design of the buildings will be in agreement with the southern California adaptation of the Mediterranean styles of Spain and Italy.

Surveying parties have already been in the field for sometime gathering data for plotting the contours of the site. While the surveys are being made the master plan is being determined upon.

## FAMILY HEAD GRATEFUL FOR RELIEF QUOTA JOB

S. V. Cortelyou,  
District Engineer,  
Los Angeles.

Dear Sir:

I must answer your card of April 14, 1932, advising me of finishing our work about May 15th, under Mr. Frank Pfeffer.

I was very sorry to receive this notice, but must say I thank you, Mr. Pfeffer and all connected in Division of Highways Department.

The wages I have earned through this work this winter have certainly been a God's gift, as I don't see how I could have fed my family of six without this work, and certainly hope it will not be long before the State can employ us again if things or work does not improve, and work is as scarce in San Diego now, if not worse, than it was last October.

As I have two girls in high school now and this maintenance fund has been exhausted, I am afraid I shall have to take them out of school, as much as I hate to.

JOHN F. OFFDENKAMP,  
San Diego.

## ENGLISH-SPANISH ROAD TERMS

English-Spanish terms used in the construction of highways have been prepared by the American Road Builders' Association in cooperation with leading authorities on the current use in Spanish-American countries.

This glossary attempts a standardization of usage which varies decidedly in different Spanish-American countries. The Spanish equivalents of 2100 English technical terms used in highway construction and maintenance are given. In a number of cases, several Spanish words are used for a single English word, varying in the different Spanish-American countries.

For example, the word "bureau" in Porto Rico is "negociado," in another country "agencia," in still another "oficina," and another "departamento."

In the meantime representatives of the Department of Institutions together with the State Architect are making a trip to view the newest institutions in this country for the care of insane so that the latest developments in provision for them may be carried into the new California institution.

The physical characteristics of the new institution both as to its site and as to the buildings and surrounding developments, will be such as to contribute in an important measure to the rehabilitation and restoration of the largest possible number of the patients committed to it.



## High Standard of Road Alignment

(Continued from page 6)

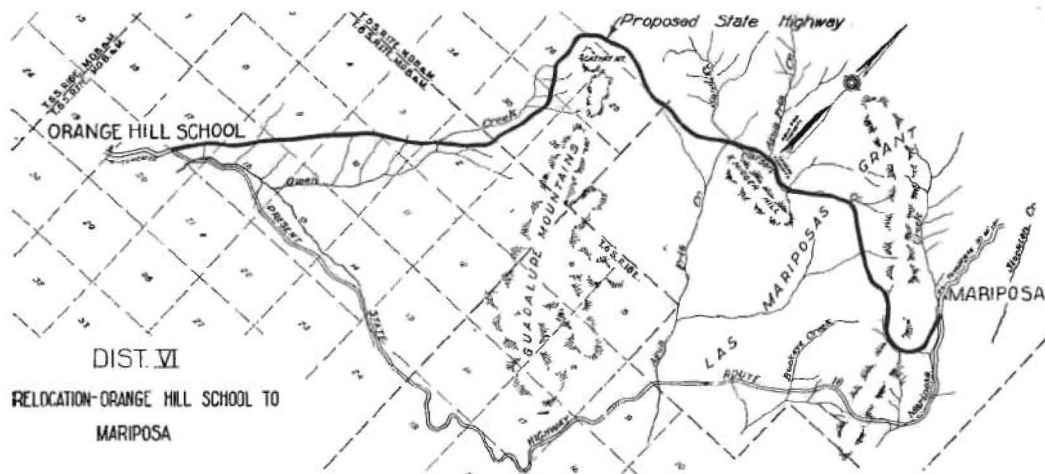
fore most of them soon became public property. In 1874 it was possible to make the trip by carriage over what was then called a good stage road.

A gradual improvement took place but with the beginning of automobile travel and especially the completing of the "All-Year Route" in 1926 travel time to this famous park became a matter of hours instead of days, and as many as 150,000 vehicles entered the Valley in a recent year. The State re-

during the winter of 1930. Contract No. 26EC4 is now in progress completing the work within the same limits. The remaining part was recently let to contracts.

Specifications for the improvement call for a 24-foot graded roadbed. As the present road is available for travel no provision for surfacing the new alignment will be made until grading is completed in spring of 1933.

A comparison of curvature and grades follows;



Map showing new highway route through old town of Carson.

granted the Yosemite to the United States as a National Park in 1905.

As an engineering improvement the new location from Orange Hill School to Mariposa was made necessary by the higher standard of alignment demanded today. The present location, built in 1918, used curves as sharp as 60 feet radius with large angles in crossing the many deep draws. To replace these hairpin turns with modern easy curves would be prohibitive in cost.

The line was therefore rerouted nearer the sources of the streams, where the canyons are not so deeply eroded and the alignment is largely parallel with the drainage rather than across.

### LAST CONTRACT LET

The plans of the relocation are now complete and approved. A portion of the construction, Orange Hill School to Pain Flat was accomplished by a day labor relief camp

### COMPARISON OF ROUTES

	Existing location	Carson Route (New location)
Length—Miles	17.5	15.0
Elevation—Maximum	1938 ft.	2445 ft.
Curves—Less than 500 ft. radius	201	0
Curvature—Total—Degrees	10,639	1,710
Total Number Curves	232	48
Minimum Radius	80	500
Roadbed Width	18 ft.	24 ft.

### MAKING GLASS BRICKS

Glass bricks, somewhat stronger in comparison than clay bricks, that freely admit light but prevent outsiders from looking through them, were demonstrated at a recent meeting of the American Institute of Architects by a consulting chemical engineer for a glass works.

The "glass bricks," he said "have a high degree of heat resistance. They will be used for decorative and ornamental effects and will be especially useful for buildings with modern air conditioning as they will permit full natural daytime lighting without the heat losses caused by most types of windows."



## State, Waging War on Puncture Vine, Experiments With Earth Sterilization

**P**UNCTURE VINE is one of the most serious infestations of noxious weeds with which agriculture in this State has to contend. Colonel Walter E. Garrison, Director of the Department of Public Works, in full realization of this fact has instructed that no effort be spared in controlling the spread of this pest along the State highway right of way.

Puncture vine smothers field crops, increases harvesting cost of grapes, cotton, etc., lowers grade of hay, wool and cotton, and reduces land values as well as creating local restrictions on movement of farm products.

The plant thrives in hot weather. Seeds mature within less than two weeks of the time the plant starts out of the ground, and seeds do not appear all at once, but continuously throughout the season, giving a succession of plants in all stages from spring to fall.

### CAN'T DODGE SPURS

The fruit of the vine is a star shaped bur cluster which splits into five burs or nutlets when it matures. Each bur has two spines so arranged that one spine always points upward. A single average plant will bear about 100 burs to the square foot during a season.

The spines on the burs attach themselves to automobile tires, live stock, hay, bedding, gravel ballast, and the seed is also disseminated by irrigation water, agricultural seed, etc. The infestation is easily spread, and is usually first found about railroad yards and along the highway.

The Division of Highways forces have cooperated with farmers and other organizations in efforts to control the pest during the past seven years. From \$8,000 to \$10,000 of highway funds have been expended for the purpose annually during that period.

Control measures consist of the cultivation of the ground whenever young plants appear and before burs form, or by spraying with Diesel oil at regular intervals of ten days to prevent development of seed.

The most serious infestation occurs in the San Joaquin Valley, and in certain desert

sections. Along the coast only an occasional patch is found, while in the northern interior counties control is still easily possible. The principal effort in these sections is to keep interest alive, and each organization on the alert to stamp out each appearance of the pest.

The Division of Highways maintenance organization is charged with the responsibility of controlling the areas of the highway right of way. Power spray and knapsack type outfits have been provided in the districts where extensive work is necessary. In other sections the knapsack type spray outfits used on roadside burning operations are available. Diesel oil of 27+ gravity is mainly used on the work.

Instructions have been issued that each section is to be patrolled throughout the season and spraying or cultivation carried on at ten-day intervals wherever infestation is found. Record is made of all infested areas.

### STERILIZING EXPERIMENT

In addition to these measures an experiment is under way looking toward the possibility of sterilizing the soil in heavily infested areas by the use of sodium chlorate. A half-mile section in Kern County has recently been treated, and results will be carefully watched.

The State Arboriculturist has been assigned to general supervision of initial measures throughout the State for the Division of Highways.

Meetings have been held between the Maintenance Engineers, Superintendents, and the Agricultural Commissioners of the counties, in order that each one may be advised of the proper methods and to insure the most complete cooperation between the two agencies.

Old Maid: "Has the canary had its bath?"  
Servant: "Yes, he has, mum. You can come in now."  
—North Dakota Highway Bulletin.

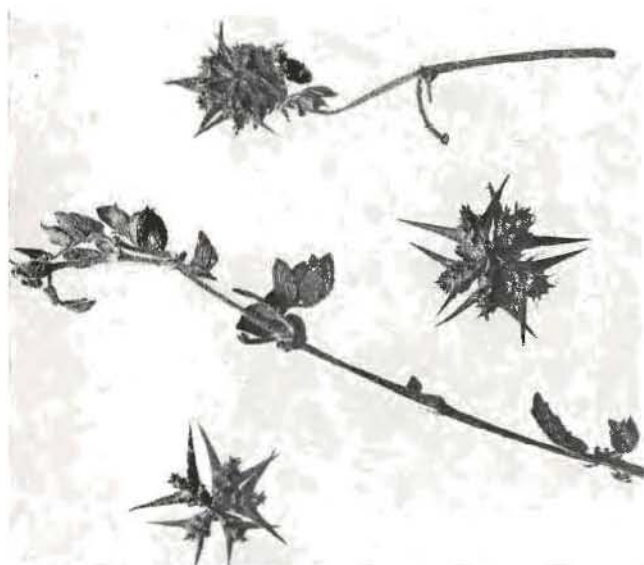
Policeman—I've had my eye on you for some time, Miss.  
Girl—Fancy that! And I thought you were arresting me for speeding.—Motor Land.

An infernal machine is any kind of motor vehicle that ambles along the middle of the road at just about ten miles per hour.





**SPREADING POISON** for the Puncture Vine, this outfit of truck and trailer equipped with tank and spray pump is being used in an earth sterilization experiment.



**FULLY ARMED** with spurs on every side is the Puncture Vine burr, nemesis of automobile tires, and there is always one spur topside, ready for action.



**PACKING A KNAPSACK** style tank, the sprayer attacks spots otherwise unreachable by hose.

# Highway Bids and Awards for April

**AMADOR, ALPINE, EL DORADO COUNTIES**—Dist. X, Rts. 34 and 23. Between Chapman and Picketts Jct. Between Picketts and Alpine Jct. and between Picketts Jct. and Hangmans Br. about 80 miles to be treated with fuel oil and asphaltic road oil. Forec Const. Co., Piedmont, \$23,855; Clyde W. Wood, Stockton, \$23,703.75; Basalt Rock Co., Inc., Napa, \$22,289.70; Tiffany, McReynolds, Tiffany, San Jose, \$21,046.75. Contract awarded to C. F. Fredericksen & Sons, Lower Lake, \$19,583.45.

**BUTTE AND PLUMAS COUNTIES**—Dist. III, Rt. 21. About 40.9 miles to be treated with oil as a dust palliative. Oilfields Trucking Co., Taft, \$7,828.95; Skeels & Graham Co., Roseville, \$8,209.50; C. F. Fredericksen & Sons, Lower Lake, \$7,638.95. Contract awarded to Basalt Rock Co., Inc., Napa, \$7,263.30.

**CONTRA COSTA COUNTY**—Dist. IV, Mt. Diablo Park Road. Furnishing and applying fuel oil as a dust palliative between Danville and the Summit and between the Forks and Walnut Creek, about 19.1 miles. Hutchinson Co., Oakland, \$4,450; Lee J. Immel, Berkeley, \$2,697.59; Edward A. Peres, Richmond, \$4,350; Helwig Const. Co., Sebastopol, \$3,875; U. B. Lee, San Leandro, \$2,575; Granite Const. Co., Ltd., Watsonville, \$4,350; C. F. Fredericksen & Sons, Lower Lake, \$3,409; Oilfields Trucking Co., Taft, \$3,775; Basalt Rock Co., Inc., Napa, \$3,275; Jack Casson, Hayward, \$3,350. Contract awarded to A. Teichert & Son, Inc., Sacramento, \$3,075.

**FRESNO AND KINGS COUNTIES**—Dist. VI, Rt. 10. Between Coalinga and Hanford, 50 miles of shoulder dust oiling. Stewart & Nuss, Inc., Fresno, \$10,128; A. Teichert & Son, Inc., Sacramento, \$13,920; Hartman Construction Co., Bakersfield, \$15,840; Granite Construction Co., Ltd., Watsonville, \$11,232; Fred W. Nighbert, Bakersfield, \$13,440. Contract awarded to Oilfields Trucking Co., Taft, \$7,632.

**GLENN COUNTY**—Dist. III, Rt. 7. In Willows, 0.4 mile to be graded and paved with A. C. A. Teichert & Son, Inc., Sacramento, \$23,887. Contract awarded to Clark & Henery Construction Co., San Francisco, \$21,843.50.

**KERN AND INYO COUNTIES**—Dist. IX, Rt. 23. 175 miles paint 4-inch traffic stripe. B. G. Carroll, San Diego, \$1,048.25. Awarded contract.

**KERN COUNTY**—Dist. VI, Rt. 58. Between Bakersfield and Junction Arvin Rd. 11.1 miles shoulder oiling; 1 mile Bit. treated gravel or stone Surf. placed; 14.5 miles dust oiling. Hartman Const. Co., Bakersfield, \$12,923.55; F. W. Nighbert, Bakersfield, \$11,261.10; Square Oil Co., Inc., \$14,989; Oilfield Trucking Co., Taft, \$11,686; Stewart & Nuss, Inc., Fresno, \$9,568.70. Contract awarded to Granite Const. Co., Ltd., \$9,491.55.

**KERN COUNTY**—Dist. VI, Rt. 57. Between westerly boundary of Kern Co. and 2.7 miles west of Maricopa, 9.5 miles dust oiling. Stewart & Nuss, Inc., Fresno, \$4,422.60; Clyde W. Wood, Stockton, \$6,786; Oilfields Trucking Co., Taft, \$5,311.80; Basalt Rock Co., Inc., Napa, \$7,768.80; Hartman Const. Co., Bakersfield, \$6,154.20; P. J. Akmadzich, Los Angeles, \$6,318; Square Oil Co., Inc., Los Angeles, \$6,130.80; F. W. Nighbert, Bakersfield, \$6,154.20. Contract awarded to Granite Const. Co., Ltd., Watsonville, \$4,141.80.

**LASSEN COUNTY**—Dist. II, Rt. 29. Furnishing and applying asphaltic road oil on State highway in Lassen County between Nevada State line and a point 2 miles W. of Milford. Tiffany, McReynolds, Tiffany, San Jose, \$6,462.40; Basalt Rock Co., Inc., Napa, \$5,908.48. Contract awarded to Skeels & Graham Co., Roseville, \$5,539.20.

**LOS ANGELES COUNTY**—Dist. VII, Route 60. Near Temescal Canyon, about 1 mile NW. of Santa Monica, construct groynes. J. W. Terrell, Sacramento, \$11,867.60; Dimmitt & Taylor, Los Angeles, \$14,175.60; Merritt, Chapman & Scott Corporation, San Pedro, \$12,598; Kemper Construction Co., Ltd., \$21,270; Lynch, Cannon Engineering Co., Los Angeles, \$10,750; Mittry Bros. Const. Co., Los Angeles, \$13,825. Contract awarded to R. R. Bishop, Long Beach, \$9,867.40.

**MADERA COUNTY**—Dist. VI, Rt. 32. Between Merced-Madera County line and Califa, about 15.5 miles of oil treating earth shoulders. Fred W. Nighbert, Bakersfield, \$6,708; A. Teichert & Son, Inc.,

Sacramento, \$6,127.50; Granite Construction Co., Ltd., Watsonville, \$4,923.50; John Jurkovich, Fresno, \$4,515. Contract awarded to Oilfields Trucking Co., Taft, \$3,848.50.

**MARIPOSA COUNTY**—Dist. VI, Rt. 18. Between Pain Flat and Mariposa, about 7.6 miles to be graded. Meyer Rosenberg, San Francisco, \$243,010.25; S. H. Palmer and J. P. Holland, Inc., San Francisco, \$248,410.50; Mittry Brothers Const. Co., Los Angeles, \$240,863.35; MacDonald & Kahn Co., Ltd., San Francisco, \$228,673; Clyde W. Wood, Stockton, \$254,650.30; Contoules Const. Co., San Francisco, \$187,224.60; The Utah Const. Co., San Francisco, \$203,427.40; Gist & Bell, Arcadia, \$249,084.30; Nevada Contract Co., Fallon, Nevada, \$269,942.30; C. T. Malcom, Walnut Grove, \$297,673.30; Fredrickson & Watson Construction Co., and Fredrickson Bros., Oakland, \$215,691.75; Morrison-Knudsen Co., Los Angeles, \$210,360.40; Kern & Kibbe, Portland, Ore., \$278,756.20; Herbert M. Baruch Corporation, Ltd., and Robinson-Roberts Co., \$322,871.50. Contract awarded to Chas. Harlowe, Jr., Oakland, \$185,052.15.

**MENDOCINO COUNTY**—Dist. I, Rt. 1. Furnishing and stockpiling crushed gravel or stone and screenings near Longvale, Mendocino County. Tieslay Bros., Berkeley, \$11,350; Smith Bros., Co., Eureka, \$11,100; Hemstreet & Bell Co., Marysville, \$12,750. Contract awarded to Basalt Rock Co., Inc., Napa, \$10,100.

**MERCED, FRESNO, TULARE AND KERN COUNTIES**—Dist. VI, Rt. 4. Furnishing and installing railroad crossing floodlights at various locations on State highway. Curtis Hess, Fresno, \$2,297.75; Elec. Service Shop, Visalia, \$1,600; Merced Hdwr. & Impl. Co., Merced, \$1,870; Robinson Elec. Co., Fresno, \$2,159. Contract awarded to Sam Fingerhut, Bakersfield, \$1,864.

**MODOC COUNTY**—Dist. II, Rt. 73. Furnishing and application of asphaltic road oil on portions of State highway in Modoc County, between the California-Oregon line near New Pine Creek and the junction of Routes 73 and 28 near Alturas. Tiffany, McReynolds, Tiffany, San Jose, \$7,919.10; Basalt Rock Co., Inc., Napa, \$7,818.54. Contract awarded to Skeels & Graham Co., Roseville, \$7,164.90.

**MONO COUNTY**—Dist. IX, Rt. 23. Between 2 miles west of Bridgeport and Sonora Junction, about 14.2 miles to be surf. with cr. run base and bituminous treated crushed gravel or stone. Southern California Roads Co., Los Angeles, \$114,846.50; Clark & Henery Construction Company, San Francisco, \$128,349; Hemstreet & Bell, Marysville, \$111,505; Tieslau Bros. and A. Mitchell, Sacramento, \$108,106.60; Granite Construction Company, Ltd., Watsonville, \$111,969; South-west Paving Company, Los Angeles, \$103,762.90; Fred W. Nighbert, Bakersfield, \$125,570.60; A. Teichert & Son, Inc., Sacramento, \$104,129.20; Isbell Construction Co., Carson City, Nevada, \$129,913.26. Contract awarded to George Herz & Co., San Bernardino, \$85,854.50.

**MONTEREY COUNTY**—Dist. V, Rt. 56. Reinforced bridge across Rocky Creek about 17 miles south of Carmel. One 239-foot open arch span and six gird. appr. sps. 258 feet long. Schuler & McDonald, Inc., Oakland, \$117,777; M. B. McGowan, Inc., San Francisco, \$72,852; Porter Bros. Corporation, San Francisco, \$80,714; J. W. Terrell, Sacramento, \$66,539.50; George J. Ulrich Construction Co., Modesto, \$67,861.30; F. C. Amoroso and Sons, San Francisco, \$67,951.50; Barrett & Hill, San Francisco, \$69,096; Obera Bros., Los Angeles, \$79,604.50; Neves and Harp, Santa Clara, \$69,732.50; Rocca & Caletti, San Rafael, \$63,002. Contract awarded to Ward Engineering Company, San Francisco, \$62,165.50.

**ORANGE COUNTY**—Dist. VII, Rt. 60. Newport Beach to Corona del Mar, 4.8 miles to be paved with P. C. C. Sander Pearson, Santa Monica, \$115,841.80; George R. Curtis Paving Company, Los Angeles, \$117,008; L. A. Paving Co., Inc., Los Angeles, \$112,392.50; J. L. McLain, Los Angeles, \$106,284; United Concrete Pipe Corporation, Los Angeles, \$113,664.50; Kovacevich & Price, Inc., South Gate, \$104,698.50; Griffith Company, Los Angeles, \$105,581; Lee Moor Contracting Co., El Paso, Texas, \$105,300.50. Contract awarded to Jahn & Bressi Construction Co., Inc., Los Angeles, \$104,291.50.



# Oiling Contracts Let in Many Counties

(Continued from preceding page)

**PLACER AND EL DORADO COUNTIES**—Dist. III, Rt. 65. About 35.8 miles to be treated with asphaltic road oil as a dust palliative. A. Teichert & Son, Sacramento, \$4,882.50; Oilfields Trucking Co., Taft, \$5,782.50; Tiffany, McReynolds, Tiffany, San Jose, \$4,680; C. W. Wood, Stockton, \$4,905; Basalt Rock Co., Inc., Napa, \$4,612.50; E. F. Hilliard, Sacramento, \$4,702.50; Force Construction Co., Piedmont, \$5,850; Skeels & Graham Co., Roseville, \$5,287.50. Contract awarded to C. F. Frederickson & Sons, Lower Lake, \$4,477.50.

**PLACER COUNTY**—Dist. III, Rt. 3. Between Lincoln and Sheridan, about 6.7 miles to be gr. and surf. with bit. tr. cr. gr. or st. (plant mix). A. Teichert & Son, Inc., Sacramento, \$45,855; J. F. Johnston, Stockton, \$43,743; McMillivray Construction Co., Sacramento, \$45,860.90; C. W. Wood, Stockton, \$58,100.50; Larsen Bros., Galt, \$49,828; Southwest Paving Co., Inc., Los Angeles, \$48,377; L. G. Kipp, Sacramento, \$53,548; Clark & Henery Const. Co., San Francisco, \$46,918.50; United Contracting Co., Oakland, \$58,920; Fred W. Nighbert, Bakersfield, \$47,869; A. Mitchell, Sacramento, \$48,888.50; Lord & Bishop, Sacramento, \$47,126.50; Pacific States Const. Co., San Francisco, \$46,548.50. Contract awarded to Hemstreet & Bell, Marysville, \$39,172.

**PLUMAS COUNTY**—Dist. II, Rt. 21. Furnishing and applying asphaltic road oil on portions of State highway in Plumas County between Bucks Ranch and Quincy. Skeels & Graham Co., Roseville, \$5,332. Contract awarded to Basalt Rock Co., Inc., Napa, \$4,678.40.

**RIVERSIDE COUNTY**—Dist. VIII, Rt. 64. Between Blythe and Ehrenberg Bridge, about 3.7 miles to be graded and surfaced with oil treated crushed gravel or stone. Gist & Bell, Arcadia, \$139,338.50; H. W. Rohl Company, Los Angeles, \$159,187; S. H. Palmer and J. P. Holland, Inc., San Francisco, \$178,091.70; George Herz & Co., San Bernardino, \$149,573.10; Basich Brothers, Torrance, \$136,064.80; V. R. Dennis Construction Co., San Diego, \$147,534; Southern California Roads Co., Los Angeles, \$153,945.80. Contract awarded to Lee Moor Contracting Co., El Paso, Texas, \$131,866.15.

**RIVERSIDE COUNTY**—Dist. VIII, Rt. 26. Between Ave. 62 and Ave. 74, about 8.3 miles to be graded and paved with P. C. C. George Herz & Co., and Kovacevich & Price, San Bernardino, \$283,793.20; Thomas C. Rogers, Los Angeles, \$349,976.50; Griffith Company, a corporation, Los Angeles, \$278,002.80; Imperial Rock Corporation and Orange Co. Rock Co., and Match Bros., Anaheim, \$370,530.52; Jahn and Bressi Construction Co., Inc., and R. E. Hazard Contracting Co., Los Angeles, \$316,524; Southern California Roads Co., Los Angeles, \$321,569.40; United Concrete Pipe Corporation, Los Angeles, \$277,802.40. Contract awarded to Lee Moor Contracting Co., El Paso, Texas, \$257,391.30.

**RIVERSIDE COUNTY**—Dist. VIII, Rt. 26. Between Ave. 74 and S'y boundary grade and pave with P. C. C. about six (6.0) miles. Lee Moor Contracting Co., El Paso, Texas, \$307,874.25; R. E. Hazard Cont. Co., San Diego, \$306,616.20; Griffith Company, Los Angeles, \$302,235.63. Contract awarded to United Concrete Pipe Corporation, Los Angeles, \$286,806.35.

**SAN DIEGO COUNTY**—Dist. VII, Rt. 12. Between Bostonia and Chocolate Creek, about 7.5 miles to be graded and paved with P. C. concrete. Frederickson & Watson Const. Co., and Fredrickson Bros., Oakland, \$243,337.50; Sander Pearson, Santa Monica, \$249,735.50; Walter Treppe, San Diego, \$239,578.50; Sharp and Fellows Contr. Co., Los Angeles, \$248,037; V. R. Dennis Construction Co., San Diego, \$245,790; Daley Corporation, San Diego, \$249,885.15; Griffith Company, Los Angeles, \$231,861.75; L. E. Dixon Co., Los Angeles, \$236,452.50; Lee Moor Contr. Co., El Paso, Texas, \$242,198.50; Thomas C. Rogers, Los Angeles, \$273,251.50; United Concrete Pipe Corporation, Los Angeles, \$245,600. Contract awarded to Bodenhamer Construction Co., Oakland, \$219,535.25.

**SANTA CLARA COUNTY**—Dist. IV, Rt. 63. Across Stevens Creek, a rein. conc. gir. bridge: 1-30' span and 1-20'10" span on conc. bents and a conc. abut. with W.W's. The Utah Const. Co., San Francisco, \$21,767; John Doyle, San Jose, \$24,694; L. C. Seidel, Oakland,

\$20,418; Nelson Bros., Escalon, \$24,059; J. W. Terrell, Sacramento, \$21,808.75; J. P. Lawlor, San Francisco, \$22,461; Thermotte Const., Inc., San Jose, \$20,777; Force Const. Co., Piedmont, \$22,147.75; Whited & Whited, Santa Rosa, \$19,082.70; Lord and Bishop, Sacramento, \$23,890.25; George Ulrich Construction Co., Modesto, \$23,608.25; A. J. Kirsch Co., San Jose, \$37,654; John E. Branagh, Piedmont, \$24,684.60; M. B. McGowan, Inc., San Francisco, \$20,573; Wm. E. Lyons, Oakland, \$22,910; Frederickson & Watson Co. and Frederickson Bros., Oakland, \$21,252; R. L. Oakley, Palo Alto, \$28,367.50; Selmer and Kendall, San Anselmo, \$25,917.50. Contract awarded to Neves & Harp, Santa Clara, \$18,461.37.

**SANTA CRUZ COUNTY**—Dist. V, Rt. 5. Between Inspiration Point and Vine Hill Road 5.1 miles to be cleared and grubbed. Meyer Rosenberg, San Francisco, \$64,940; A. Mitchell, Sacramento, \$45,050; Moore & Washburn, Santa Cruz, \$39,015; Guy F. Atkinson, San Francisco, \$44,540; J. E. Ely, Oroville, \$25,075. Contract awarded to Fred W. Nighbert, Bakersfield, \$15,980.

**SHASTA COUNTY**—Dist. II, Rt. 28. Between Hat Creek Summit and Fall River Mills, about 8.7 miles to be graded and surf. with cr. run base and bit. tr. cr. gr. or stone, plant mix. Hemstreet & Bell, Marysville, \$349,679; A. Teichert & Son, Inc., Sacramento, \$373,543.50; Von der Heln & Pierson, Castaic, \$416,124.50; S. H. Palmer and J. P. Holland, Inc., San Francisco, \$445,401.15; A. Guthrie & Co., Inc., Portland, Ore., \$365,280; Hartman Construction Co., Bakersfield, \$449,317.50; Nevada Contracting Co., Fallon, Nev., \$413,213; Dunn & Baker, Klamath Falls, \$406,983; Isbell Construction Co., Carson City, Nev., \$479,529.25; Clark & Henery Construction Co., San Francisco, \$412,982.50; Kern & Kibbe, Portland, Ore., \$333,142.75; Morrison-Kausen Co., Los Angeles, \$461,407.20; Clarence Young & C. T. Malcom, Walnut Creek, \$468,507.75; T. E. Connally, San Francisco, \$479,881.50. Contract awarded to F. C. Coats, Sacramento, \$331,551.

**SISKIYOU COUNTY**—Dist. II, Rt. 46. Furnish and apply asphaltic road oil on portions of State highway between Route 3 and Walker. Oilfields Trucking Co., Taft, \$1,938.80; Basalt Rock Co., Inc., Napa, \$2,371.10. Contract awarded to Skeels & Graham Co., Roseville, \$1,801.25.

**SISKIYOU COUNTY**—Dist. II, Rt. 72. Furnishing and application of fuel oil and asphaltic road oil on portions of State highway in Siskiyou County, between Weed and State line near Calor. Basalt Rock Co., Inc., Napa, \$9,412; Oilfields Trucking Co., Taft, \$19,687. Contract awarded to Skeels & Graham, Roseville, \$8,567.50.

**SOLANO COUNTY**—Dist. X, Rts. 7 and 8. Between one-half mile W. of Cordelia and one-third mile E. of Fairfield about 6.4 miles to be graded and paved with P. C. C. Hein Bros., Basalt Rock Co., and J. V. Galbraith, Petaluma, \$213,758.30; Frederickson & Watson Construction Co., Frederickson Bros., Oakland, \$195,823.90; C. W. Wood, Stockton, \$189,563.75; Union Paving Co., San Francisco, \$203,473.65; Healey-Moore Co., Oakland, \$232,364.95; United Concrete Pipe Corporation, Los Angeles, \$209,837.85; Peninsula Paving Company, San Francisco, \$226,878.05; Hanrahan Company, San Francisco, \$195,124.25; Southern California Roads Co., Los Angeles, \$212,891.50. Contract awarded to D. McDonald and N. B. Ball, Sacramento, \$185,083.15.

**SONOMA COUNTY**—Dist. VI, Rt. 8. Furnish and place bituminous treated crushed gravel or stone surface between Fairville and Vineburg Junction, about 1 mile. Pacific States Construction Co., San Francisco, \$8,430; C. W. Wood, Stockton, \$8,320; A. Teichert & Son, Inc., Sacramento, \$7,542; H. A. Anderson, Sacramento, \$8,415; Helwig Construction Co., Sebastopol, \$7,430; J. V. Galbraith, Petaluma, \$8,375. Contract awarded to U. B. Lee, San Leandro, \$8,320.

**SONOMA AND MARIN COUNTIES**—Dist. IV, Rt. 1. Furnish and apply light fuel oil to earth shoulder each side of existing pavement between Windsor and Sausalito, about 51.7 miles. C. F. Frederickson & Sons, Lower Lake, \$5,206; The A. Helwig Const. Co., Sebastopol, \$6,612; Tiffany McReynolds, Tiffany, San Jose, \$6,270; A. Teichert & Son, Inc., Sacramento, \$6,840; Basalt Rock Co., Inc., Napa, \$5,296; Oilfields

(Continued on page 33)



## *New California Institution for Women Near Tehachapi Dedicated by Governor*

**G**OVERNOR JAMES ROLPH, Jr., dedicated the new building group of the California Institution for Women in Cummings Valley near Tehachapi in Kern County, at 2 p.m. on Sunday, May 22d. The Governor was assisted by State legislators and officials including Senator James I. Wagy of Bakersfield and Assemblywoman Eleanor Miller of Los Angeles; Daniel J. O'Brien, director of the Department of Penology; Colonel Walter E. Garrison, director of the Department of Public Works, and James I. Herz, deputy director; the Board of Trustees of the Institution, Mrs. Ernest Wallace of Alhambra, chairman, Judge T. N. Harvey of Bakersfield, vice chairman, and Miss Grace Barneberg of San Luis Obispo.

The Kern County Chamber of Commerce entertained Governor Rolph with a breakfast at the El Tejon Hotel at 10 a.m. and later a cavalcade of automobiles occupied by the Chamber of Commerce members and other distinguished citizens of Kern County escorted the gubernatorial party to the dedication ceremonies. Mr. Ernest Wallace, chairman of the Board of Trustees, acted as chairman of the day.

### IMPRESSIVE PROGRAM

The program opened with an invocation by Rev. Alonzo W. Reynolds of the First Methodist Episcopal Church of Bakersfield. Assemblywoman Eleanor Miller, introduced by Senator Wagy, told how the legislation creating the institution was formulated. Director O'Brien introduced Governor Rolph who delivered the dedication address and performed the dedicatory ceremonies. Monseigneur Philip G. Seher, Vicar General, Diocese of Monterey-Fresno, closed the impressive exercises with the benediction. Music was furnished by the Kern County Union Highway School Band.

The new institution is situated on a tract of 1682 acres in Cummings Valley about 9 miles north of the town of Tehachapi in the southern part of Kern County, at an elevation of about 4000 feet. The cost of the site was about \$100,000.

It is intended that the new institution shall be opened in July next, the women now

detained at the State Prison at San Quentin to be transferred from there thus releasing the present Women's Building at San Quentin for use as a hospital for males.

### FOUR BUILDINGS

The four new buildings to be dedicated are of reinforced concrete in Norman style erected at a cost of \$450,000, and consisting of an Administration Building, a Detention Building and two cottages. The Administration Building besides the administrative offices provides quarters for the superintendent, employees, dining rooms and kitchen; hospital unit with observation rooms and a chapel. The Detention Building provides for about 80 inmates in two separated groups of about 40 each, and each of the two cottages provides for about 40 inmates. The capacity of the institution at the outset therefore will be for about 170 inmates. The master plan for ultimate development is laid out to admit future additional buildings as required.

Temporary buildings only will be provided at the present time for poultry, dairy and hogs.

The opening of this new institution has a very special significance since it is California's recognition after many years of preliminary work on the part of the devoted women of the State of the thoroughly established fact that female law violators should not be detained in the same institution with male violators.

### MUCH MORE ROOM

Whereas the women prisoners now confined at San Quentin are required to develop all the activities of their lives on an area of less than two acres of ground which includes the building in which they are housed and the entire open space available for outdoor activities, at the new institution in Cummings Valley there will be available to them as already stated an area of 1682 acres so that all the activities both in and out of doors in which they can be advantageously engaged can be provided.

It is confidently expected that the proportion of women committed to the institution whose rehabilitation will justify their return to society with safety to society and to them-

(Continued on page 40)



**ART AND HEART** went hand in hand in planning this group of buildings for the California Institution for Women, located in Cummings Valley near Tehachapi, Kern County. Housed in these spacious, well equipped structures of Norman architectural design, women heretofore crowded in San Quentin will be rehabilitated for their return to society. The large Detention Building and two dormitory cottages are at the left of the group with the Administration Building at right. This air-view was taken by the 115th Photo Section, Fortieth Division Aviation, California National Guard, Griffith Park, Los Angeles.

## State Highway Link Gives View of Akron

(Continued from page 2)

in their endeavor to secure the Sunnyvale dirigible site for California.

### VISITORS INVITED

Concluding the dedication Admiral Cole stated it was desirable to have all civilians enter the air base and view the great ship, as it was the pride of the American people and they should have every opportunity to see the benefits of the Navy's activities in aeronautics.

The total expenditure in this Sunnyvale link has been approximately \$48,000. This amount, added to the total spent to date in constructing the Bayshore Highway between San Francisco and San Jose, approximates a total of \$4,000,000. In addition to this sum there is now being expended an additional \$636,000 to extend grading and paving of this important arterial highway from Redwood City to Palo Alto.

The Division of Highways will also contract, during the early summer, for further grading and paving of an additional unit of the Bayshore Highway from Palo Alto to the Lawrence Station Road in Santa Clara County.

## Architect McDougall Making a Study Tour

**G**EORGE B. McDOUGALL, A.L.A., Chief of the Division of Architecture of the Department of Public Works has been sent East to make a study of the largest penal institutions and hospitals for the insane in the country.

Mr. McDougall's trip comes as the result of the recent selection of a site near Camarillo, Ventura County, that will ultimately be expanded into the largest hospital for the insane in the State with a capacity for 5000 patients. Governor Rolph, Dr. J. M. Toner, Director of Institutions, and Colonel Walter E. Garrison, Director of Public Works, decided that such a trip was necessary to secure the latest ideas for the design and construction of such a building and Daniel J. O'Brien, Director of Penology, urged that the itinerary be extended to take in prisons for ideas to be incorporated in the prison for first offenders to be built in the South.

Accordingly, the State Architect will visit twenty-one institutions in eleven cities and eight states, including New York, Boston, Chicago, Washington, D. C.; Alderson, West Virginia; Stillwater, Minnesota, and Tacoma, Washington.



## Six Bridges on Major Project List

(Continued from page 16)

California and the northwest, will, when completed, replace the light 80-foot steel truss with its 21-foot roadway which was built some 16 years ago by the county and will provide traffic with a modern crossing at this point.

### SIX NEW BRIDGES

The six bridges included in the projects proposed for advertising during May include the following major structures:

Where the Coast Route of the State highway system crosses the Ventura River at the northerly city limits of Ventura, the Division of Highways plans the construction of a new bridge. The new structure will be at the same location as the existing 1160-foot concrete deck arch and deck girder bridge, with its 20-foot roadway, which was built by the county in 1912. The proposed bridge will be of the reinforced concrete girder type and will consist of 19 spans having a total length of 1233 feet; the roadway will be 44 feet wide with two sidewalks.

This modern structure, as an improvement to the heavily traveled arterial connecting Los Angeles and San Francisco, will tie in with the reconstruction of the route through the city of Ventura. It is planned to start the street work later this year as a cooperative project financed by the city of Ventura, the State and Ventura County.

This street improvement will follow Main, Garden and Meta streets. The State is to pay for a 30-foot width of pavement and a proportional part of the cost of grading and drainage structures while the city and county will bear the remaining cost of constructing the streets 56 and 76 feet between curbs. The citizens of Ventura voted \$100,000 in bonds this past winter for the project. The street improvement in Ventura together with the new bridge across the river will relieve one of the most congested traffic conditions in this section of the State.

### BEAUTIFUL STRUCTURE

Further improvement to the scenic San Simeon-Carmel Highway, which skirts the rugged bluffs along the shore of the Pacific in Monterey and San Luis Obispo counties, will be made by the construction of a bridge across Wild Cat Creek at "The Highlands," a few miles south of Carmel. This new reinforced concrete structure, while only 164 feet in length, will be a beautiful bridge composed of three arch spans faced with stone native to this scenic coast country. The graceful line and symmetry of these stone arches will give a pleasing effect in the rugged and rocky setting. The bridge will provide a clear roadway 34 feet wide with two 4-foot side walks and will replace the existing narrow timber trestle.

In San Joaquin County the old three-span steel truss bridge across Paradise Cut between Tracy and Stockton, on the Oakland-Stockton lateral will be replaced by a modern structure composed of 10 steel stringer spans on reinforced concrete piles. The new bridge will be 440 feet long and will provide a 34-foot roadway, as against the 18-foot roadway on the existing 24-year-old structure. The alignment upon which the proposed bridge is to be placed coincides with the alignment of the pavement which was recently constructed between Banta and Mossdale.

### WIDENING OPERATION

At the county line between Stanislaus and San Joaquin counties the State highway bridge across the Stanislaus River at Ripon, on the Los Angeles-Sacramento arterial, is to be reconstructed. The reconstruction includes the widening of the two 103-foot arch spans and replacing the timber approach spans with 23 reinforced concrete and steel girder spans, each 44 feet long, giving a total length of 1218 feet for the new structure. The new roadway width will be 21 feet.

Another unit in the reconstruction of the southerly end of the main highway between Los Angeles and San Diego will be the construction by the State of the overhead crossing over the tracks of the Atchison, Topeka and Santa Fe Railway in Sorrento Canyon, just north of the city limits of San Diego.

This overhead structure will consist of 13 reinforced concrete spans with a total length of 553 feet. It will provide a clear roadway width of 44 feet. This structure is located on the new alignment of the highway between Sorrento Creek and Del Mar which is now being constructed by the State and is a part of the general reconstruction of this entrance into San Diego which is being brought to completion by several projects under a general cooperative agreement between the State and the city of San Diego.

Projects involved in this reconstruction include the Rose Canyon Cut-off which was completed over a year ago, the reconstruction of the famous Torrey Pines grade and the placing of a one-way highway paralleling the existing road from the top of the grade to the northerly end of the Rose Canyon road and paving from the southerly end of the Rose Canyon road to Atlantic Street; also the construction of a bridge across the San Diego River and another, which is now under construction, across Sorrento Creek. This last structure is located about a quarter of a mile south of the proposed Sorrento Canyon overhead.

### APRIL ARCHITECTURAL AWARDS

Stockton State Hospital—Contract for general work on kitchen and bakery building, to Gath and Fox, Sacramento, \$85,514; for electrical work to Eddy Electric Company, Stockton, \$4,035; for plumbing and heating to Jos. C. Black, Stockton, \$25,200.

Industrial Home for Adult Blind, Berkeley—Contract for general work on superintendent's residence, to Gaubert Bros., \$8,385; for heating work to Pacific Heating & Ventilating Co., \$1,050; for plumbing work to Carl T. Doell, Oakland, \$1,492; for electrical work to Geo. Woolf, \$467.

Sonoma State Home, Eldridge—Contract for water tube boiler and accessories to California Steel Products Co., \$9,987.

Folsom State Prison—Contract for water tube boiler and accessories, to California Steel Products Co., \$9,137.

"Under the spreading chestnut tree  
The smith works like the dence,  
For now he's selling gasoline,  
Hot dogs, and orange juice"

"You say Mr. Peck is very patient with his wife?"  
"Didn't I just tell you that he explained the principle of free wheeling to her?"—*Borrow Pit.*





Due to the assurance generally of an ample water supply for the season, irrigation projects are in a somewhat more hopeful position than they were a year ago, but because of the difficulty and sometimes impossibility of many landowners financing crop production during the current season there is likely to be a considerable decrease in the acreage under cultivation. This is particularly noticeable in rice planting, and to a lesser extent in most other field crops, says the report of State Engineer Hyatt for April.

Details of irrigation projects, the outlook for summer stream flow, results of water basin investigations, flood control and dam projects are among the other activities of the Division of Water Resources covered in the report as follows:

In connection with obtaining information necessary to the State Engineer's office or required by the Districts Securities Commission, the following districts were visited: Anderson-Cottonwood irrigation district, Shasta County; El Camino and Deer Creek irrigation districts, Tehama County; Princeton-Codora-Glenn and Glenn-Colusa irrigation districts, Glenn County; Richvale irrigation district, Butte County; West Side irrigation district, San Joaquin County; East Contra Costa and Byron-Bethany irrigation districts, Contra Costa County.

#### DISTRICTS SECURITIES COMMISSION

On March 22, Commissioners Rainey, Vogel and Hyatt and Secretary Bonte, met at Merced with the directors and an executive committee of Merced irrigation district landowners for the consideration of district affairs, especially with reference to financial matters.

A regular meeting of the Districts Securities Commission was held at San Francisco on April 8, at which reports on Terra Bella, Anderson-Cottonwood, West Side, Paradise and Oroville-Wyandotte irrigation districts were given consideration.

#### DAMS

To date 802 applications have been received for approval of dams built prior to August 14, 1929; 93 for approval of plans for construction or enlargements and 255 for approval of plans for repairs or alterations.

#### Applications Received for Approval of Plans for Repair or Alteration.

Dam	Owner	County
Harold	Littlercck and Falmsdale Jr. Dist.	San Diego
Willow Hill	Natomas Company	Sacramento
Daly	Geo. Kyburz	Sacramento
Veterans' Home	State Veterans' Home	Napa
Detert Lake	Detert Estate	Lake
Ridenour	Ridenour Estate	Lassen

#### Plans Approved for Construction or Enlargement.

Dam	Owner	County
Antioch	Town of Antioch	Contra Costa
Irvine Conservation	The Irvine Company	Orange

#### Plans Approved for Repairs or Alterations.

Fourteen of such applications were approved during the period.

Routine inspections of dams reveal that many reservoirs are full, which fact permits the department to make observations of these structures under loading. This has not been possible for several years in a great many cases.

Office studies are nearing completion on old dams and certificates of approval will be issued shortly on those structures which meet the requirements; while orders will be issued on those dams which require repairs or alterations to place them in satisfactory condition.

Most of the alterations consist in enlargement of spillways to handle the excess waters expected in times of flood. Since the new law governing the supervision of dams went into effect on August 14, 1929, more than a third of the existing structures have been voluntarily repaired in accordance with suggestions of this office.

#### FLOOD CONTROL AND RECLAMATION

##### Maintenance of Sacramento Flood Control Project.

The maintenance headquarters near Sutter City has been completed and the work of transferring material and equipment is well under way and will be completed within the next month.

Flashboards have been placed in weirs Nos. 2, 3 and 4 and the water raised to full height, which is made necessary on account of the recent lack of rain. The regular annual repair to the earth dam in Gilsizer Slough is now being made so that water may be held in the east borrow pit between weir No. 2 and Willow Slough for the irrigation of the Willow levee protection.

The banks of the East Intercepting Canal have been reinforced to prevent caving at the crossing of the Sutter-Butte Canal Company flume.

## 240 Projects Listed for Inspection

(Continued from page 31)

### *Emergency Flood Protection and Rectification of Rivers.*

In cooperation with Riverside County and landowners, rectification work on Bautista Wash, a tributary of the San Jacinto River, has been completed at a cost of \$1,500.

Bank protection work on the left bank of the San Joaquin River between the Mossdale Bridge and the Banta Carbona intake, in cooperation with a group of landowners, has been completed at a cost of \$5,000. This work consisted of repairing and securing tree protection installed two years ago, and the construction of tree and brush protection at two other points, protecting about 600 feet of river bank. The larger section of about 400 feet consists of a log toe dam secured in place by 34 screw anchors with a levee facing of logs and brush.

### *Sacramento Flood Control Project—Bank Protection.*

No work of this class is under way at the present time. An examination has been made of the conditions of the banks on the Sacramento River above the Butte City bridge in connection with possible future work.

### *Naravro River.*

Approximately 200 tons additional rock have been placed on the jetty at the mouth of the Russian River. This completes the maintenance work contemplated for this fiscal year.

### *Russian River Jetty.*

Work was discontinued on the jetty at Jenner on April 6th, as it was considered that the steel trestle and the other portions of the structure were made sufficiently secure, so that further work can be safely deferred until good weather. It is proposed to commence work in the quarry on about May 10th, and to start placing rock in the jetty about June 1st.

### *Flood Measurements and Gages.*

On account of the lack of flood stages in the various channels of the Sacramento and San Joaquin Valley, no discharge measurements have been made. The routine work of maintaining the continuous water stage gages has been continued and the compilation of records has continued in the office.

### WATER RIGHTS

#### *Applications to Appropriate.*

Twenty-six applications to appropriate were received during the month of March, 7 were denied and 11 were approved, 1 permit was revoked and 35 licenses were issued.

The field season in connection with inspection of projects covered by permits and licenses began on April 4th and it is estimated will continue until November 1st. Some 240 projects are listed for inspection and the work will take engineers of the Division into all counties of the State.

### ADJUDICATIONS

*North Cow Creek (Shasta County)*—A decree defining the water rights on North Cow Creek, based upon the amended stipulation for judgment heretofore signed by all parties, has been prepared by the Division upon request of the Superior Court of Shasta County, and is being circulated among counsel.

*Clover Creek (Shasta County)*—Action on the case in the Superior Court of Shasta County is pending the outcome of negotiations for settlement by stipulation.

*Deep Creek (Modoc County)*—A schedule of allotments for trial distribution during the 1932 irrigation season was adopted by the water users at a meeting held on March 15, 1932 at Cedarville.

*Franklin Creek (Modoc County)*—At a conference held at Alturas on March 14, 1932, the water users agreed to a plan of distribution for the 1932 season.

*New Pine Creek (Modoc County)*—The stipulation for judgment submitted to the water users at a conference held at New Pine Creek on March 16, 1932, was signed by 80 per cent of the parties at interest, and is now being circulated among the remaining parties.

*Eagle Creek (Modoc County)*—The plan for trial distribution of the waters of the stream for the 1932 irrigation season, submitted to the water users at a conference held at Eagleville on March 15, 1932, was adopted.

*South Fork Pit River (Modoc County)*—Field work on the South Fork Pit River Reference was commenced April 1. A plan for the distribution of the waters of the stream during the 1932 season was adopted by the water users at a meeting held April 12, and distribution under the plan was started on April 15.

*Pine Creek (Modoc County)*—Adjudication by Agreement of the water rights on Pine Creek was discussed with the water users on that stream at a meeting held April 13. The water users were agreeable to such an adjudication, but desired that a plan of distribution be tried out during the 1932 season before effecting a final settlement. An agreement covering such a plan of distribution is being circulated among the water users for signature.

### WATER DISTRIBUTION

*Cedar, Davis, Deep, Emerson, Franklin, Mill, New Pine, Owl and Soldier creeks and South Fork of Pit River (Modoc County)*—Water master service on these streams for the 1932 season was commenced on the dates as follows:

Soldier Creek—March 19.

Deep Creek—March 20.

Cedar, Davis, Emerson, Franklin, New Pine and Owl creeks—April 1.

South Fork Pit River—April 15.



# Forecasts of Stream Flow Published

(Continued from preceding page)

## SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Office work in compilation of the annual report presenting all 1931 data on the diversions, stream flow, return flow, use of water, salinity, etc., for the Sacramento-San Joaquin territory has continued during the past month and is nearing completion. Work on the special report of damage in 1931 due to salinity and water shortage is also nearing completion.

Sampling at 19 permanent salinity stations in the Upper Bay and Delta region and operation of tide gages has been maintained. Tests of samples taken on April 10th were as follows:

## SALINITY—UPPER BAY AND SACRAMENTO-SAN JOAQUIN DELTA

Station	Salinity in parts of chlorine	
	per 100,000 parts of water	
Point Orient.....	1240*	
Point Davis.....	420	
Bullshead.....	130	
Bay Point.....	26*	
O. and A. Ferry.....	1**	
Collinsville.....	1	
Antioch.....	1	
Jersey.....	3	
Central Landing.....	3	
Middle River P. O.....	6	

\* April 14th  
\*\* April 6th

Irrigation has begun on many of the projects in the Sacramento Valley and the field work in checking and measuring all diversions, return flow, etc., was started on April 1st. From present indications the rice area in the Sacramento Valley will be considerably less than that of last year. The outlook for summer stream flow is somewhat disappointing from the standpoint of the earlier heavy snows and precipitation. Present estimates based upon all available precipitation and snow data place the seasonal run-off (October to September, inclusive) in per cent of a 40-year normal at 65 per cent for the Sacramento River at Red Bluff, 75 per cent for the Feather River at Oroville and 90 per cent for the Yuba River and American River at Smartsville and Fair Oaks, respectively.

### MINIMUM STREAM FLOWS

The combined run-off for Sacramento River and tributaries is estimated at 75 per cent and the combined percentage for the entire Sacramento-San Joaquin area is estimated at 90 per cent. Under these conditions minimum 1932 stream flows are estimated at follows: Sacramento River at Red Bluff 2700 second-feet; at Colusa 1800 second-feet; at Sacramento 2300 second-feet; Feather River at Nicolaus 500 second-feet; American River at Sacramento 210 second-feet; San Joaquin River near Vernalis 1500 second-feet; minimum combined flow of Sacramento and San Joaquin rivers to the Delta, 3900 second-feet. With these conditions, maximum salinity at Delta stations in 1932 is estimated at 650 parts of chlorine per 100,000 at O. and A. Ferry, 450 at

Collinsville, 330 at Antioch, 150 at Emmaton, 90 at Jersey, and 30 at Rio Vista.

The most important snow surveys as respecting predictions for spring and summer water supply were completed at the end of March and the monthly bulletin of snow survey and precipitation data, including also the seasonal forecast, was mailed early in April. The end of March surveys covered all of the snow courses throughout the Sierra and the data obtained furnished the basis for the forecasts of stream flow as published in the bulletin.

## IRRIGATION—FEDERAL COOPERATION

In connection with the Federal-State cooperation for irrigation investigations, an inspection trip was made in the week of March 14 to 19 to review the progress of investigations in the Santa Ana, Mojave, and Ventura areas. Present field and office work on these projects is directed to a determination of the penetration of rainfall and to the consumptive use of water by various irrigated and nonirrigated crops, by brush cover, and by noneconomic aquatic growths. Special studies include the losses by evaporation and transpiration from moist and seeped areas and along stream channels. The heavy rains of the past winter have offered a fine opportunity to complete the penetration of rainfall studies.

## WATER RESOURCES

*South Coastal Basin Investigation*—Investigational work has been continued in a normal way in this area. The major portion of the material for a bulletin on water levels in the South Coastal Basin area has been assembled and placed in the hands of the State Printer.

*Mojave River Investigation*—The discharge of the Mojave for the first time in several years was large enough to cause flow into the desert sinks where the water is disposed of. Water levels have risen near the stream. The data secured this year in this as in other investigations give a basis for more definite conclusions than any heretofore gathered in the course of the investigation.

*Ventura County Investigation*—Water levels have risen in this area and the investigation is proceeding along normal lines.

*Salinas Valley Investigation*—As in the Ventura County area, water levels have risen in this area and the investigation is being continued along normal lines.

*Pit River Investigation (Modoc and Lassen counties)*—Work has been continued during the present month on the report covering the three years investigation of the Pit River.

*Santa Clara Investigation*—During the month of March levels were taken in all wells of the Santa Clara Valley which are under investigation in connection with this study. The generous precipitation of December, January and early February has caused several of the streams to flow throughout the month, a

(Continued on page 40)



## Napa Bridge Formally Dedicated With Impressive Ceremonial Program

**T**HE new \$65,000 "G. M. Francis Bridge," spanning the Napa River in the city of Napa, was formally dedicated to highway traffic Saturday, May 14th, with colorful ceremonies and entertainments.

The dedication program and celebration features were arranged by a committee headed by Eugene Webber, President of the Napa Chamber of Commerce, Supervisor Thomas Maxwell, Chairman of the Board of Supervisors of Napa County and Vice President of the Redwood Empire Association, and Mayor Frank W. Alexander of Napa, together with the members of the city council and Charles Grady, Secretary of the Napa Chamber of Commerce.

It was a memorable occasion with high Federal, State, county and city officials in attendance from various parts of Northern California including State highway officials and engineers, county supervisors and other county officers, mayors and city councilmen, Chambers of Commerce leaders, newspaper publishers and a host of other principals.

Representing the State were Colonel Walter E. Garrison, Director of Public Works; Earl Lee Kelly, chairman of the California Highway Commission; Rolland A. Vandegrift, Director of Finance, and Timothy A. Reardon, Highway Commissioner.

### LUNCHEON FOR GUESTS

At noon a delightful luncheon was tendered the visitors by the Napa Chamber of Commerce in the Chamber's headquarters, where numerous principals present were introduced with brief remarks from some of them.

After luncheon a parade headed by the Boy Scouts' Band of Vallejo led the guests to the new G. M. Francis Bridge where the dedication exercises commenced with the national anthem led by D. G. Davis, and Supervisor Thomas Maxwell, as master of ceremonies conducted the following program after a word of welcome by Mayor Alexander and brief greetings by Harry Lutgens, President, Redwood Empire Association:

### PROGRAM OF EXERCISES

Address—Rolland A. Vandegrift, Director of Finance, State of California.

Address—Timothy A. Reardon, Highway Commissioner from San Francisco.

Address—Colonel Walter Garrison, Director of Public Works, State of California.

Greetings by Senator Herbert W. Slater of Sonoma County.

Address—Earl Lee Kelly, Chairman, California Highway Commission, representing Governor James Rolph, Jr.

Presentation of giant redwood plaque, designating Napa as "Southeastern Gateway to Redwood Empire," by L. J. Peterson, President of Redwood Empire Chambers of Commerce Unit.

Address—Honorable Frank L. Coombs in tribute to the memory of G. M. Francis.

The christening ceremony was performed by Miss Matilda Allison and the ribbon barricade was cut by Miss Iris Harrold, daughter of City Engineer H. A. Harrold.

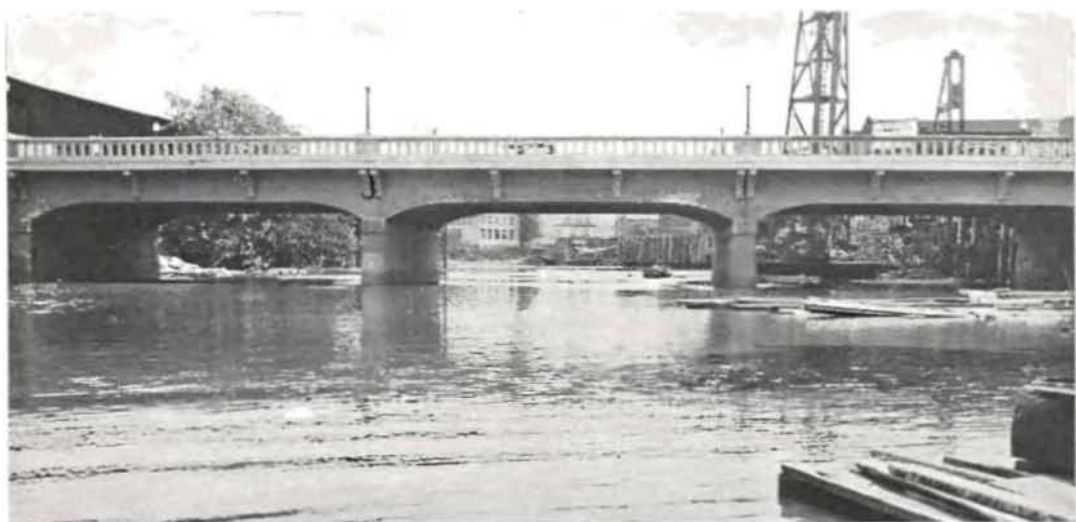
The bridge was formally named in honor of the late George M. Francis, dean of California publishers, former President of California Press Association and for many years publisher of the Napa Register.

One of the most beautiful phases of the program was the tribute to the memory of G. M. Francis, presented by Honorable Frank L. Coombs, and the christening of the bridge immediately thereafter by Miss Matilda Allison of Napa, Area President, American Legion Auxiliary.

### FESTIVITIES CONTINUED

Other State officials in attendance included: Hugh McKeivitt, Attorney for the California Highway Commission; John W. Howe, Secretary of the Commission; F. W. Panhorst, Acting Bridge Engineer; Mrs. Dr. Joseph M. Toner, representing Dr. Toner, Director of Institutions, who is in the east; T. E. Ferneau, Associate Bridge Construction Engineer, who was the resident engineer on the job, and others.

After the ceremonies, a band concert was held on the courthouse steps by the Lincoln School Band and Vallejo Boy Scouts' Band, and at 7.30 p.m. a spectacular night parade was staged under the direction of Sheriff J. P. Steckter of Napa as grand marshal. A ball at which the grand march was led by Mayor Alexander closed the day's festivities.



Giant sand-etched redwood plaque presented to the City of Napa by the Redwood Empire Association during the bridge dedication. This plaque is to be superimposed upon 8-foot cross section of giant redwood tree as marker for Napa, Southeastern Gateway to the Redwood Empire. Left to right: Harry Lutgens, President, Redwood Empire Association; Mayor Frank W. Alexander of Napa, who accepted the plaque; L. J. Peterson of Petaluma, President, Redwood Empire Chambers of Commerce Unit, who presented the plaque; Earl Lee Kelly, Chairman, California Highway Commission, and Supervisor Thomas Maxwell, Chairman of the Board of Supervisors of Napa County.

Enduring beauty is symbolized in this bridge carrying State Highway Route 8 across the Napa River into the City of Napa. Built as a cooperative project by State, City and County, it is 153 feet long, with a 44-foot roadway and a 7-foot sidewalk on each side. Of reinforced concrete construction the three uniform spans of 51 feet with arched girders give a pleasing side view, and an elaborate handrail and lighting system add to the impression of a structure solidly built for sheer utility yet not lacking in aesthetic proportions.

#### THEY COME IN ALL SHADES, MAN

"Hullo, Brown, painting the car again?"  
"Yes, the wife's been making innuendoes about a spring coat she says exactly matches the color of the car."—*Passing Show.*

Cop: "Say, young fellow, there's no parking here; you can't loaf along this road!"

Voice Within Car: "Who's loafin'?"  
—*Mississippi Highways.*

#### VOYAGE OF DISCOVERY

Employer: "Can you operate a typewriter?"  
Steno: "Yes, sir, I use the Biblical system."  
Employer: "I never heard of it."  
Steno: "Seek and ye shall find."

—*No. Dakota Bulletin.*

"Fill her up," said the absent-minded motorist to the waiter, as he parked himself in the restaurant with his sweetie.—*Lamplighter.*



# Vital Statistics on Dam Construction

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources during the month of April, 1932.

**SAN DIEGO COUNTY**—Corte Madera Dam No. 837. Corte Madera Corp., San Diego, owner; earth and rock, 14 feet above streambed with a storage capacity of 59 acre-feet, situated on Corte Madera Valley tributary to Pine Creek in Sec. 16, T. 15 S., R. 4 E., S. E. B. B. and M., for storage purposes for irrigation use.

**CALAVERAS COUNTY**—Maskus Dam No. 497. Fred Maskus, Ripon, owner; earth, 20 feet above streambed with a storage capacity of 25 acre-feet, located in Sec. 2, T. 4 N., R. 10 E., M. D. B. and M., for storage purposes for stock watering use.

**TUOLUMNE COUNTY**—Smith Dam No. 552. Smith Ditch and Mining Company, Jamestown, owner; rock, 30 feet above streambed with a storage capacity of 13 acre-feet, situated on Woods Creek tributary to Tuolumne River in Sec. 1, T. 1 N., R. 14 E., M. D. B. and M., for diversion purposes for domestic, irrigation and mining use.

**CALAVERAS COUNTY**—Copperopolis Reservoir No. 498. Calaveras Consolidated Mining Company, Ltd., San Francisco, owner; concrete wall and earth, 27½ feet above streambed with a storage capacity of 225 acre-feet, situated on Penny Creek tributary to Stanislaus River in Sec. 53, T. 2 N., R. 12 E., M. D. B. and M., for storage purposes for domestic and milling use.

**CALAVERAS COUNTY**—Copperopolis Tailings Dam No. 498-2. Calaveras Consolidated Mining Company, San Francisco, owner; earth, 28 feet above streambed with a storage capacity of 6 acre-feet, situated on Copperopolis Creek tributary to Stanislaus, located in Sec. 2, T. 1 N., R. 12 E., M. D. B. and M., for storage of tailings.

**LOS ANGELES COUNTY**—Johnston's Lake Dam No. 19-2. City of Pasadena, Pasadena, owner; earth, 9 feet above streambed with a storage capacity of 32 acre-feet, situated on a draw tributary to Arroyo Seco, located on Burling Drive., for storage purposes for recreation use.

**LASSEN COUNTY**—Round Valley Dam No. 228. Rees T. Jenkins Land and Livestock Co., Johnstonville, owner; earth and rock, 35 feet above streambed with a storage capacity of 2000 acre-feet, situated on Round Valley Creek tributary to Willow Creek in Sec. 30, T. 31 N., R. 12 E., M. D. B. and M., for storage purposes for irrigation and stock use.

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 April, 1932.

**SACRAMENTO COUNTY**—Willow Hill Reservoir No. 453-2. Natomas Water Company, Sacramento, owner; earth, located in Sec. 12, T. 9 N., R. 7 E., M. D. B. and M.

**SACRAMENTO COUNTY**—Dally Dam No. 452. G. O. and Jennie Kyburz, Folsom, owner; earth, situated on a draw tributary to Alder Creek in Sec. 21, T. 9 N., R. 8 E., M. D. B. and M.

**NAPA COUNTY**—Veterans' Home Dam No. 1-14. Veterans' Home, Napa, owner; earth, situated on Overhold Creek tributary to Napa River.

**LAKE COUNTY**—Detert Lake Dam No. 392. Richard Detert, Mills Tower, owner; earth, situated on Bucksport Creek tributary to Putah Creek in Sec. 9, T. 10 N., R. 6 W., M. D. B. and M.

**LASSEN COUNTY**—Ridenour Dam No. 259. S. D. Ridenour, Susanville, owner; earth, situated on unnamed drainage tributary to Susan River in Sec. 17, T. 29 N., R. 12 E., M. D. B. and M.

**SOLANO COUNTY**—Suisun Dam No. 21. Town of Suisun, Suisun, owner; earth, situated on unnamed creek tributary to Suisun Valley Creek in Sec. 12, T. 5 N., R. 3 W., M. D. B. and M.

**NEVADA COUNTY**—Pine Grove Dam No. 312-2. San Juan Ridge Mutual Water Association, Marysville, owner; earth, situated on unnamed creek tributary to South Yuba River in Sec. 19, T. 17 N., R. 8 E., M. D. B. and M.

**SAN MATEO COUNTY**—Filoli Dam No. 617. Filoli Inc., San Mateo, owner; earth, situated on branch of Laguna Creek tributary to San Mateo Creek in Sec. 30, T. 5 S., R. 4 W., M. D. B. and M.

**AMADOR COUNTY**—Bear River Dam No. 97-61. Pacific Gas and Electric Company, San Francisco, owner; rock, situated on Bear River tributary to North Fork Mokelumne in Sec. 9, T. 8 N., R. 16 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 April, 1932.

**SANTA BARBARA COUNTY**—La Patera Dam No. 751. The Sherman P. Stow Company, Santa Barbara, owner; earth, 14.7 feet above streambed with a storage capacity of 162 acre feet, located in Sec. 7, T. 4 N., R. 28 W., S. B. B. and M., for storage purposes for irrigation use.

**LOS ANGELES COUNTY**—Patrick Reservoir No. 778-4. Santa Catalina Island Company, Avalon, owner; earth, 46 feet above streambed with a storage capacity of 61½ acre-feet, situated on a small creek tributary to Grand Canyon in Sec. 32, T. 9 S., R. 14 W., S. B. B. and M., for storage purposes for domestic use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources, during the month of April, 1932.

**SAN DIEGO COUNTY**—Harold Dam No. 57-2. Palmdale Irrigation District, Palmdale, owner; earth, located in Sec. 3, T. 5 N., R. 12 W., S. B. B. and M.

**AMADOR COUNTY**—Henderson Dam No. 1-16. Preston School of Industry, Waterman, owner; earth, situated on Middle Fork of Mule Creek tributary to Sutter Creek in Sec. 9, T. 6 N., R. 10 E., M. D. B. and M.

**SAN DIEGO COUNTY**—L. Helix Dam No. 56-4. La Mesa, Lemon Grove and Spring Valley Irrigation District, La Mesa, owner; earth, located in Sec. 21, T. 16 S., R. 1 W., S. B. B. and M.

**SACRAMENTO COUNTY**—Willow Hill Dam No. 453-2. Natomas Water Company, Sacramento, owner; earth, located in Sec. 12, T. 9 N., R. 7 E., M. D. B. and M.

**SACRAMENTO COUNTY**—Daley Dam No. 452. G. O. and Jennie A. Kyburz, Folsom, owner; earth, situated on a draw tributary to Alder Creek in Sec. 21, T. 9 N., R. 8 E., M. D. B. and M.

**NAPA COUNTY**—Veterans' Home Dam No. 1-14. Veterans' Home, Napa, owner; earth, situated on Overhold Creek tributary to Napa River.

**LASSEN COUNTY**—Ridenour Dam No. 259. S. D. Ridenour, Susanville, owner; earth, situated on unnamed drainage tributary to Susan River in Sec. 17, T. 29 N., R. 12 E., M. D. B. and M.

**SOLANO COUNTY**—Suisun Dam No. 21. Town of Suisun City, Suisun, owner; earth, situated on unnamed creek tributary to Suisun Valley Creek in Sec. 12, T. 5 N., R. 3 W., M. D. B. and M.

**LAKE COUNTY**—Detert Lake Dam No. 392. Richard Detert, San Francisco, owner; earth, situated on Bucksport Creek tributary to Putah Creek in Sec. 9, T. 10 N., R. 6 W., M. D. B. and M.

**NEVADA COUNTY**—Pine Grove Dam No. 312-2. San Juan Ridge Mutual Water Assn., Marysville, owner; earth, situated on unnamed creek tributary to South Yuba River in Sec. 19, T. 17 N., R. 8 E., M. D. B. and M.

**SAN MATEO COUNTY**—Filoli Dam No. 617. Filoli Inc., San Mateo, owner; earth, situated on branch of Laguna Creek tributary to San Mateo Creek in Sec. 30, T. 5 S., R. 4 W., M. D. B. and M.

**AMADOR COUNTY**—Bear River Dam No. 97-61. Pacific Gas and Electric Company, San Francisco, owner; rock, situated on Bear River tributary to North Fork Mokelumne River in Sec. 9, T. 8 N., R. 16 E., M. D. B. and M.



# April Water Applications and Permits

Applications for permits to appropriate water filed with the State Department of Public Works, Division of Water Resources, during the month of April, 1932.

**SAN DIEGO COUNTY**—Application 7223. Andrew O. Lyall and H. N. Nelson, c/o A. O. Lyall, 1906 E. State St., Long Beach, for 1,875 c.f.s. from Pauma Creek tributary to San Luis Rey River to be diverted in Sec. 9, T. 10 S., R. 1 W., M. D. B. and M., for irrigation and domestic purposes (40 acres).

**MENDOCINO COUNTY**—Application 7224. Aulie M. Barnes, Dos Rios, for 0.087 c.f.s. from 2 springs tributary to Eel River to be diverted in Sec. 35, T. 22 N., R. 13 W., M. D. B. and M., for irrigation and domestic purposes (5 acres). Estimated cost \$400.

**SIERRA COUNTY**—Application 7225. Kanaka Mines Syndicate, c/o J. E. Lee, Mgr., 2744 Steiner St., San Francisco, for 20 c.f.s. from Kanaka Creek tributary to Middle Fork Yuba River to be diverted in Sec. 9, T. 18 N., R. 10 E., M. D. B. and M., for power purposes (91 H.P.).

**SAN BERNARDINO COUNTY**—Application 7226. Panamint Mining Co., c/o Peemster, Perkins & McCormick, Attys., Bank of America Bldg., Visalia, for 1000 g.p.d. from Natural Spring to be diverted in Sec. 21, T. 26 S., R. 45 E., M. D. B. and M., for domestic purposes. Estimated cost \$200.

**VENTURA COUNTY**—Application 7227. Ray La Valle, 1331 3d St., Bakersfield, for 0.125 c.f.s. and 5 acre-feet per annum from Sam Young Spring tributary to Cuddy Canyon to be diverted in Sec. 5, T. 8 N., R. 19 W., S. E. B. and M., for irrigation and domestic purposes (400 acres). Estimated cost \$2,000.

**LOS ANGELES COUNTY**—Application 7228. Dean A. Davis, c/o Geo. R. Castle, 431 Southwest Bldg., Los Angeles, for 2 gallons per minute from 4 unnamed springs tributary to Santa Clara River to be diverted in Sec. 25, T. 4 N., R. 13 W., S. E. B. and M., for domestic purposes. Estimated cost \$500.

**SHASTA COUNTY**—Application 7229. C. E. Limp-right, c/o Wm. L. Harris, 375 Mills Bldg., San Francisco, for 10 c.f.s. from Boulder Creek tributary to Clear Creek, thence Sacramento River to be diverted in Sec. 33, T. 32 N., R. 6 W., M. D. B. and M., for mining and domestic purposes. Estimated cost \$5,000.

**SHASTA COUNTY**—Application 7230. C. B. Limp-right, c/o Wm. L. Harris, 375 Mills Bldg., San Francisco, for 4 c.f.s. from Brandy Creek tributary to Clear Creek thence Sacramento River to be diverted in Sec. 28, T. 32 N., R. 6 W., M. D. B. and M., for mining and domestic purposes.

**SOLANO COUNTY**—Application 7231. Mrs. Clara Peck, c/o A. E. Morse, Cordelia, for 0.5 c.f.s. from Greenvalley Creek tributary to Suisun Bay to be diverted in Sec. 26, T. 5 N., R. 3 W., M. D. B. and M., for irrigation purposes (40 acres).

**YOLO COUNTY**—Application 7232. Rose Vargas Rose, 3709 Bigler Way, Sacramento, for 0.32 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 22, T. 7 N., R. 4 E., M. D. B. and M., for irrigation purposes (25 acres).

**EL DORADO COUNTY**—Application 7233. B. W. Stone, 161 Ellis St., San Francisco, for 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 S. Fork Rubicon River tributary to American River Drainage Area 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. 11, 31, 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.

**TRINITY COUNTY**—Application 7234. J. S. Rivers, c/o W. Ernest Dickson, 1st National Bank Bldg., Eureka, for 8 c.f.s. from Lake Creek and Hennessey Creek tributary to Trinity River to be diverted in Secs. 3 and 10, T. 5 W., R. 6 E., H. B. and M., for mining purposes.

**CALAVERAS COUNTY**—Application 7235. Comanche Mining Co., Comanche, for 3 c.f.s. from Mokelumne River tributary to San Joaquin River to be diverted in Sec. 5, T. 4 N., R. 10 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$2,000.

**INYO COUNTY**—Application 7236. American Potash & Chemical Corporation, Trona, for 0.00736 c.f.s. from Indian Joe Canyon tributary to Searles Lake to be diverted in Sec. 24, T. 24 S., R. 42 E., M. D. B. and M., for industrial and domestic purposes.

**HUMBOLDT COUNTY**—Application 7237. James Henry Hilton, Korb, for 1.0 c.f.s. from Jake Miller Gulch tributary to Klamath River to be diverted in Sec. 1, T. 9 N., R. 4 E., H. B. and M., for mining purposes.

**MENDOCINO COUNTY**—Application 7238. Curtis T. Orwick, Cummings, for 1.0 c.f.s. from Squaw Creek tributary to Rattlesnake Creek thence S. Fork Eel River to be diverted in Sec. 20, T. 23 N., R. 16 W., M. D. B. and M., for recreational and domestic purposes. Estimated cost \$200.

**PLACER COUNTY**—Application 7239. C. W. Earle, Rocklin, 0.1 c.f.s. from Secret Ravine tributary to Dry Creek thence Sacramento River to be diverted in Sec. 20, T. 11 N., R. 7 E., M. D. B. and M., for irrigation purposes (8 acres). Estimated cost \$500.

**HUMBOLDT COUNTY**—Application 7240. Fred Brace, Orleans, for 2 c.f.s. from Wilson Creek, tributary to Klamath River to be diverted in Sec. 17, T. 11 N., R. 6 E., H. B. and M., for mining purposes.

**EL DORADO COUNTY**—Application 7241. United States, El Dorado National Forest, c/o Edwin P. Smith, Supervisor, Placerville, for 1600 g.p.d. from Dartmouth Cove Creek tributary to Upper Echo Lake to be diverted in Sec. 2, T. 11 N., R. 17 E., M. D. B. and M., for domestic purposes. Estimated cost \$250.

**DEL NORTE COUNTY**—Application 7242. United States, Siskiyou National Forest, c/o G. E. Mitchell, Supervisor, Grants Pass, Oregon, for 0.017 c.f.s. from unnamed stream tributary to Middle Fork Smith River to be diverted in Sec. 32, T. 18 N., R. 4 E., H. B. and M., for domestic purposes.

**DEL NORTE COUNTY**—Application 7243. United States, Siskiyou National Forest, c/o G. E. Mitchell, Supervisor, Grants Pass, Oregon, for 0.017 c.f.s. from unnamed stream tributary to Smith River to be diverted in Sec. 29, T. 17 N., R. 2 E., H. B. and M., for domestic purposes. Estimated cost \$850.

**KERN COUNTY**—Application 7244. B. O. Bradshaw and W. I. Wyman, c/o W. I. Wyman, Isabella, for 2.5 c.f.s. from French Gulch Creek tributary to Kern River to be diverted in Sec. 20, T. 26 S., R. 32 E., M. D. B. and M., for mining purposes.

**SISKIYOU COUNTY**—Application 7245. C. Scott Greening, c/o Tebbe & Tebbe, Attorneys, Peters & De Witt Bldg., Yreka, for 25 c.f.s. from West Fork of Indian Creek tributary to Indian Creek thence Klamath River to be diverted in Sec. 23, T. 18 N., R. 6 E., H. B. and M., for mining purposes. Estimated cost \$150.

**SISKIYOU COUNTY**—Application 7246. George T. Ostrom, c/o Kilpatrick & Goodman, Attorneys, Latham Square Bldg., Oakland, for 7.5 c.f.s. from T Bar Creek tributary to Klamath River to be diverted in Sec. 13, T. 13 N., R. 6 E., H. B. and M., for power purposes (340.9 H.P.). Estimated cost \$10,000.

**SISKIYOU COUNTY**—Application 7247.—George T. Ostrom, c/o Kilpatrick & Goodman, Attorneys, Latham Square Bldg., Oakland, for 7.5 c.f.s. from T Bar Creek tributary to Klamath River to be diverted in Sec. 13, T. 13 N., R. 6 E., H. B. and M., for mining purposes. Estimated cost \$10,000.

**SIERRA COUNTY**—Application 7248. George W. Hallock, c/o R. E. Taylor, Downville, for 12.5 c.f.s. from Jim Crow Canyon tributary to north Fork Yuba River to be diverted in Sec. 15, T. 19 N., R. 11 E., M. D. B. and M., for mining purposes. Estimated cost \$3,000.

**MENDOCINO COUNTY**—Application 7249. Eugene Provost, Dos Rios, for 0.025 c.f.s. from unnamed creek tributary to Eel River to be diverted in Sec. 24, T. 22 N., R. 14 W., M. D. B. and M., for domestic and recreational purposes. Estimated cost \$300.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources, during the month of April, 1932.

**HUMBOLDT COUNTY**—Permit 3874, Application 7179. Thomas H. Selvage, Burck, April 4, 1932, for .022 c.f.s. from unnamed spring in Sec. 30, T. 2 S.,

## Water Permits and Applications in April

(Continued from page 37)

R. I. W., H. B. and M., for irrigation and domestic purposes on 8 acres. Estimated cost \$300.

**HUMBOLDT COUNTY**—Permit 3875, Application 7062. Arthur McBride, Winford Ottley and Ralph Peters, Orleans and George W. Smith of Etna, April 6, 1932, for 3 c.f.s. from Five Mile Creek in Sec. 16, T. 11 N., R. 6 E., H. M., for mining and domestic purposes. Estimated cost \$1,200.

**MENDOCINO COUNTY**—Permit 3876, Application 6936. Amanda P. Day, Cummings, April 9, 1932, for 0.087 c.f.s. from Big Dinn Creek tributary to S. Fork Eel River in Sec. 12, T. 23 N., R. 17 W., M. D. B. and M., for domestic and irrigation purposes on 5 acres. Estimated cost \$500.

**EL DORADO COUNTY**—Permit 3877, Application 7164. Verna W. Drake, Greenwood, April 9, 1932, for 1.0 c.f.s. from Jackass Creek and Orillo Creek tributary to Greenwood Creek and S. Fork American River in Sec. 7, T. 12 N., R. 10 E., M. D. B. and M., for mining purposes. Estimated cost \$25.

**SISKIYOU COUNTY**—Permit 3878, Application 7058. L. E. Hallford, Happy Camp, April 9, 1932, for 3.09 c.f.s. from Phillips Gulch tributary to Oak Flat Creek thence Klamath River in Sec. 30, T. 16 N., R. 7 E., H. B. and M., for mining purposes. Estimated cost \$2,000.

**NEVADA COUNTY**—Permit 3879, Application 7050. R. A. Chipman, Nevada City, April 13, 1932, for 0.50 c.f.s. from Dutch Flat Canyon tributary to Bear River in Sec. 34, T. 16 N., R. 10 E., M. D. B. and M., for mining and domestic purposes.

**SAN JOAQUIN COUNTY**—Permit 3880, Application 6748. Ralph and George W. Coffey, 1402 Oakland Bank Bldg., Oakland, April 14, 1932, for 3.72 c.f.s. from Lone Tree Creek tributary to San Joaquin River in Sec. 26, T. 1 S., R. 8 E., M. D. B. and M., for irrigation of 297.2 acres. Estimated cost \$2,000.

**SAN BERNARDINO COUNTY**—Permit 3881, Application 6916. Aubrey Wardman, Whittier, April 14, 1932, for 2.50 c.f.s. from underground water from unnamed canyon tributary to Santa Ana River in Sec. 16, T. 1 N., R. 6 W., S. B. B. and M., for domestic and irrigation purposes of 350 acres. Estimated cost \$25,000.

**PLUMAS COUNTY**—Permit 3882, Application 6728. W. H. Morrison, Indian Fall Lodge, Plumas County, April 20, 1932, for 0.20 c.f.s. from 2 unnamed springs tributary to Indian Creek and Feather River in Sec. 3, T. 25 N., R. 9 E., M. D. B. and M., for domestic purposes. Estimated cost \$3,000.

**SAN DIEGO COUNTY**—Permit 3883, Application 7035. Marion Webber, Palomar Mountain, Cal., April 22, 1932, for 0.05 c.f.s. from a spring tributary to Culca Creek and Temecula River in Section 29, T. 9 S., R. 1 E., S. B. B. and M., for domestic use and the irrigation of 40 acres. Estimated cost \$1,000.

**BUTTE COUNTY**—Permit 3884, Application 7192. Shelley E. Lee, Box C, Biggs, April 25, 1932, for 3.00 c.f.s. from Main South Canal of Reclamation District No. 100 tributary to Butte and Sacramento rivers in Sec. 14, T. 18 N., R. 1 E., M. D. B. for the irrigation of 149 acres. Estimated cost \$3,000.

**SAN JOAQUIN COUNTY**—Permit 3885, Application 6953. C. H. Wallace and R. A. Caswell, Route 4, Box 304, Modesto, April 28, 1932, for 8.94 c.f.s. from Stanislaus River tributary to San Joaquin River in Sec. 3, T. 3 S., R. 7 E., M. D. B. and M., for domestic use and the irrigation of 715 acres. Estimated cost \$4,000.

**SOLANO COUNTY**—Permit 3886, Application 7194. James McNully Est., c/o Lola Dodini, R. P. D. No. 1, Box 26, Suisun, April 28, 1932, for 0.87 c.f.s. from Ledgewood Creek tributary to Suisun Bay in Sec. 8, T. 5 N., R. 2 W., M. D. B. and M., for the irrigation of 70 acres.

It's all right for a woman to hold on to her youth—but not while he is driving.

"Where's old Bill been lately? I haven't seen him for months."

"What? Haven't you heard? He's got three years for stealin' a car."

"What did he want to steal a car for? Why didn't he buy one an' not pay for it, like a gentleman!"

—*The Outspan.*

## In Memoriam

**SAMUEL HERZ**, father of James I. Herz, Deputy Director of the Department of Public Works, died at the French Hospital in San Francisco May 10th from injuries sustained when he was struck down by a hit-and-run driver in that city April 21st. Mr. Herz and his wife were waiting to board a street car when the accident occurred. In a heroic effort to save her from injury, Mr. Herz pushed his wife out of the direct path of the onrushing vehicle and was himself struck down.

Born in Rumania, Mr. Herz was 60 years old. He had been a manufacturer in San Francisco for many years and was active in fraternal and community life of the city. He is survived by his widow, Mrs. Elsie Herz, two sons, James I. and Jay J. Herz, a daughter, Mrs. Milton Jellins, two grandsons and two granddaughters.

## OILING CONTRACTS LET IN MANY COUNTIES

(Continued from page 27)

Trucking Co., Taft, \$5,536. Contract awarded to Lee J. Immel, Berkeley, \$4,712.

**TRINITY COUNTY**—Dist. II, Rt. 20. The furnishing and application of fuel oil on portions of State highway between Weaverville and White's Bar Creek. Basalt Rock Co., Inc., Napa, \$8,751.04. Contract awarded to Skeels & Graham Co., Roseville, \$7,550.44.

**TUOLUMNE COUNTY**—Dist. X, Rt. 13. Between Stoddard Springs and Que de Porca, about 36.3 miles in length to be treated with fuel oil as a dust palliative. A. Telchert & Son, Inc., Sacramento, \$8,915; Basalt Rock Co., Inc., Napa, \$9,383.50. Contract awarded to Tiffany, McReynolds, Tiffany, San Jose, \$8,725.

**TUOLUMNE AND MARIPOSA COUNTIES**—Dist. X, Rt. 13-40. Between Mountain Pass and Yosemite National Park, about 32.2 miles. Furnishing and applying fuel oil and asphaltic road oil. A. Telchert & Son, Inc., Sacramento, \$12,379; Skeels & Graham Co., Roseville, \$10,740; Basalt Rock Co., Inc., Napa, \$9,636.20; F. W. Nighbert, Bakersfield, \$12,595.10; Oilfields Trucking Co., Taft, \$13,329; C. F. Fredericksen & Sons, Lower Lake, \$8,754.10. Contract awarded to C. W. Wood, Stockton, \$7,880.50.

**YUBA, NEVADA AND SIERRA COUNTIES**—Dist. III, Rt. 15-25. About 66.2 miles to be treated with asphaltic road oil as a dust palliative. C. W. Wood, Stockton, \$9,810; Basalt Rock Co., Inc., Napa, \$8,617.50; Skeels & Graham Co., Roseville, \$9,117.50; Oilfields Trucking Co., Taft, \$10,219.60; Tiffany, McReynolds, Tiffany, San Jose, \$9,462.30. Contract awarded to C. F. Fredericksen & Sons, Lower Lake, \$7,731.20.

Jack and Jill  
Sped down a hill  
And hit a curve quite sharp:  
The car turned turtle,  
Jack's wreath was myrtle,  
And Jill is playing the harp.

Just because the course of true love never did run smooth, don't think the detours run any smoother.  
—*Na. Dakota Highway Bulletin.*

"Animals," says a naturalist, "don't know how lucky they are." Does a family of rabbits, for instance, realize that they are running about in a beautiful sealskin coat?—*Psach.*

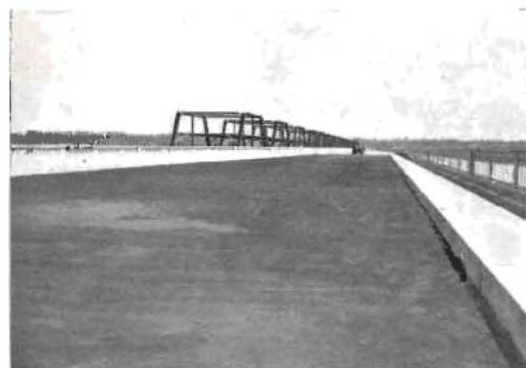


# Santa Clara River Bridge, Longest Steel Span in State, Dedicated May 13

By V. A. ENDERSBY, Construction Engineer, Bridges

**T**HE old Santa Clara River Bridge has been honorably discharged for disability in the service of the State of California by the construction of the longest steel bridge so far built on State Highway.

The original bridge was built in various sections from 1898 to 1916 and has long since been both weak from old age and dangerously narrow for present day traffic. It has been supported by underpinning for



**LONG WATER JUMP** is made by this new Santa Clara River bridge. Trusses of old structure show on left.

some time past, and during the floods of last winter was at times in serious danger of collapse. Undoubtedly, however, the original structure built in 1898 was very probably regarded as in excess of the needs of that day.

The new bridge is 1806 feet long, consisting of 21 86-foot deck plate girder spans on concrete piers resting on steel piling. The bridge has a concrete deck. This type of construction is extremely economical, first, because placing the main supporting members under the roadway permits a much lighter floor construction; second, rapid construction is possible because the steel can be built while the piers are under construction and can be rapidly placed when the piers are finished, many of these spans having been swung into place at the rate of one per day; third, the design of the steel being very plain and simple, the shop costs are low; fourth, the concrete deck can be supported while pouring upon the steel work so that expensive falsework is unnecessary.

The old bridge had a roadway width of 20 feet while the new structure will have a 42-foot roadway and one 5-foot sidewalk. It is to be noted that between the early part of 1924 and 1929, the maximum daily traffic rose from approximately 3000 vehicles per day to almost 12,000, or a four-fold increase. Study of traffic possibilities led the designers to provide for future additional widening on the north side of the bridge, even as constructed. This provision was made by constructing a detachable rail and curb and incorporating a connection in the steel work so that any

future widening will involve no junking of present structure.

A large part of the work of the State Highway Bridge Department during the past years has been widening, in some cases doubling or tripling the width of, relatively new structures.

The cost of this bridge was extremely low as compared with what it would have been a few years ago, or with the cost of a structure with old type high trusses. The allotment made for construction was \$296,400 and the actual cost will be \$280,500, which includes the making of approach fills and temporary oiled surfacing not contemplated in the original contract and which features enable the opening of the bridge long before it would otherwise have been available for public use, as the construction of pavement, which will begin shortly, will occupy some time. H. R. Lendecke was resident engineer for the State.

In August, 1898, Ventura County turned out in wagons and buggies to witness the ceremonies that opened the first bridge across the Santa Clara River. On May 13, thirty-four years later, citizens of Ventura County with State, county and municipal officials drove out in two processions of modern automobiles from Oxnard and Ventura to dedicate the new bridge.



**JUNK PILE** awaits this narrow old wooden structure with its unsightly overhead girder trusses built in 1898.

The caravans met at the center of the long steel and concrete structure where appropriate dedicatory ceremonies were held participated in by George C. Power, City Councilman of Ventura, the only living member of the group of county officials who built the first bridge; Jack Miller, Secretary of the Oxnard Chamber of Commerce; Mayor George Hartman of Ventura; Mayor E. R. Gill of Oxnard; Fred Smith, President of the Ventura Chamber of Commerce; E. R. Squires, President of the Oxnard Chamber, and A. F. Walden, President of the Ventura County Chamber; T. G. Gabbert, Chairman of Ventura Supervisors, and S. V. Cortelyou, District Engineer of the California Department of Public Works, Highway Division, representing the State.

## Forecasts of Stream Flow Published

(Continued from page 33)

condition which has not obtained for several years, and which has given an opportunity for tests of percolation which will be useful should the district proceed with the plan of development which has been proposed, and has afforded some data which will be useful in estimating the yield of the various watersheds tributary to the valley.

**Napa Valley Investigation**—The water level was taken during March in all wells which were under observation in connection with this investigation and a series of percolation measurements was taken on Conn Creek for the purpose of establishing the behavior of this stream during the early spring months. It is expected that this series of measurements will be repeated at an early date after pumping has started from the various wells in adjacent areas. Stream gagings were made on Napa River, Rector, Dry and Conn creeks and thereafter gages were regularly observed once each week.

### STATE WATER PLAN

Bulletin No. 28, Division of Water Resources, entitled "Economic Aspects of a Salt Water Barrier Below Confluence of Sacramento and San Joaquin Rivers," one of a series of reports prepared on the State Water Plan, was released by the State Engineer on March 24, 1932.

The report presents the results of a comprehensive investigation as to the economic aspects of a salt water barrier. This investigation has involved a survey and study of the upper bay and delta regions, with particular reference to manufacturing industries, industrial water front structures, irrigation, reclamation, flood control, navigation, fishing, municipalities, sewage and industrial waste disposal, and the effect of a barrier thereon. Estimates have been made of immediate future and ultimate water requirements for all purposes.

An essential feature of the investigation has been a study of alternate plans, with and without a barrier, to provide the basic requirements of salinity control and dependable fresh-water supplies for the upper bay and delta regions. The purpose of this study was to determine, if possible, the most practicable and economical means of supplying present and ultimate water demands and facilitating the development of industries, municipalities and agriculture in the area. Finally, consideration has been given to the necessity and economic justification of a barrier, not only as a means for serving the needs of the upper bay and delta regions but also as a unit for attaining the maximum conservation and utilization of the State's water resources.

On April 22, the California Water Resources Commission held a meeting in San Francisco to further consider the initial units of the State Water Plan proposed for immediate development of the State's water resources and the formulation of a constitutional amendment providing for its fulfillment.

"There is a job some excavating contractor abandoned once upon a time, probably long ago and before our time," said a contractor to his wife as they were driving along observing some mountains in the distance.—*Texas Highways*.

## In Memoriam

AGNES M. REARDON, wife of Timothy A. Reardon, California Highway Commissioner and Chief of the State Division of Labor Statistics and Law Enforcement, died of pneumonia at her home in San Francisco on May 17.

Born in San Francisco, Mrs. Reardon was the daughter of Captain John O'Neil, a distinguished soldier and officer who rode with General Phil Sheridan throughout the Civil War. Her whole life was devoted to charitable work. She took an active part in every patriotic campaign during the World War and was prominent in every public charitable drive in San Francisco.

Mrs. Reardon was the mother of two sons, William A. and Louis V., who survive her and two daughters, both deceased. One daughter, Eileen, wife of James A. Toner, died recently in San Francisco. Her other daughter, Agnes, died some years ago.

## INSTITUTION FOR WOMEN NEAR TEHACHAPI DEDICATED BY GOVERNOR

(Continued from page 28)

selves will be greatly increased beyond what it has been heretofore in this State.

The California Institution for Women constitutes the Division of Women's Prisons of the State Department of Penology of which Daniel J. O'Brien is Director. The institution is operated under the management of a Board of Trustees composed of five members, the present membership being Mrs. Ernest Wallace, Chairman; Miss Grace Barneberg, Judge T. N. Harvey and Mr. W. Kee Maxwell. Mrs. Wallace by virtue of her position as Chairman of the Board is the Chief of the Division of Women's Prisons. Miss Alicia Mosgrove is the Superintendent.

The Division of Architecture in designing and erecting the buildings and other structures has had the very important assistance of Mrs. Helen Van Pelt as Landscape Architect.

### SAFETY IN COLORS

Thousands of accidents, many of them fatal, occur each year to persons walking on highways wearing dark clothing which makes it practically impossible for drivers to see them, according to the public safety department of the Automobile Club of Southern California. In addition to facing traffic while walking on a motor road, pedestrians can add to their safety by wearing some piece of light colored clothing.

Open cars manufactured in the United States last year numbered only 160,000, as compared with 1,880,000 closed cars produced.



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Department of Public Works

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Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample



STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS

MAP  
SHOWING  
STATE HIGHWAY SYSTEM

1931

LEGEND

Primary Roads   
Secondary Roads 