

centimeters

0 1 2 3 4 5 6 7 8 9 10

inches

0 1 2 3 4

16 (M) 17 18 (B) 19 20 21 22 23 24 25 26 27 28 29 30

49.25 38.62 28.86 18.19 8.29 3.44 31.41 72.46 72.95 28.37 54.91 43.96 62.74 52.79 50.87
 -0.16 -0.18 0.54 -0.05 -0.81 -0.23 20.98 -24.46 16.63 13.06 -38.91 52.00 3.46 50.88 -27.17
 0.01 -0.04 0.00 0.73 0.19 0.48 -19.48 69.50 14.94 30.77 30.01 81.23 -14.72 -26.46 19

Golden Thread

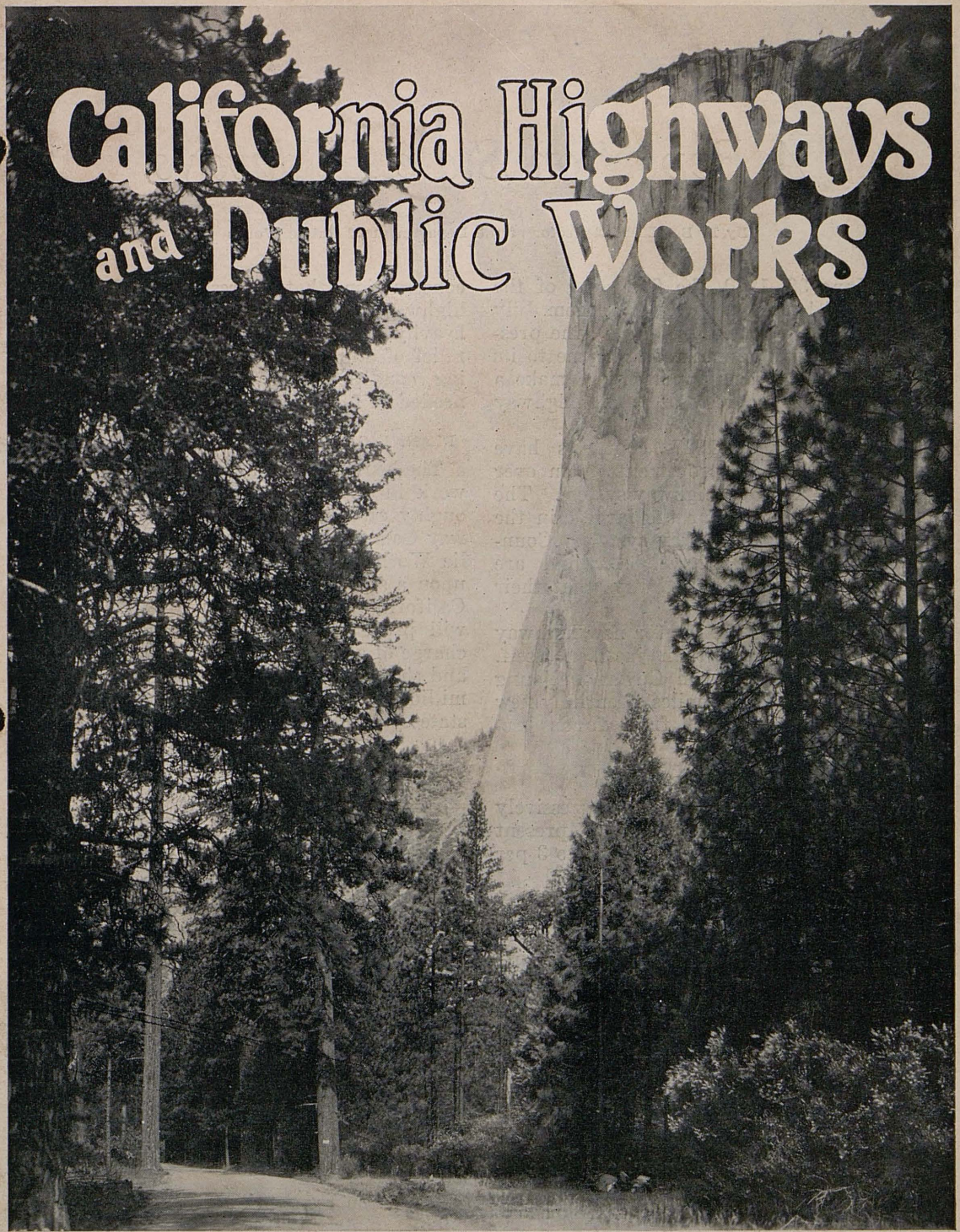
1 2 3 4 5 6 7 8 9 10 11 (A) 12 13 14 15

39.12 65.43 49.87 44.26 55.56 70.82 63.51 39.92 52.24 97.06 92.02 87.34 82.14 72.06 62.15
 13.24 18.71 -2.34 -13.80 9.82 -33.43 34.26 11.81 48.55 -5.40 -9.60 -0.75 -1.06 -1.19 -1.07
 15.07 16.72 -22.29 22.89 -24.49 -0.35 39.60 -40.07 19.51 1.13 0.23 0.21 0.43 0.28 0.19

Density → 0.04 0.09 0.15 0.22 0.36 0.51

D50 Illuminant, 2 degree observer

Colors by Munsell Color Services Lab



California Highways and Public Works

IN THE YOSEMITE VALLEY

Official Journal of the Department of Public Works
 JULY-AUG. State of California 1930

A Report on State Highways

By B. B. MEEK, Director of the Department of Public Works

ON June 30, 1930, the first year of the second biennium (extending from July 1, 1929, to June 30, 1931) of the present state highway administration came to its close. The time seems opportune to make a report on the progress of state highway affairs.

Since January 1, 1927, contracts have been let for major improvements upon over 2100 miles of the State highway system. The program has been by far the largest in the history of the State highway system. Counties and communities have been and are rapidly being given the highways that their development requires.

The one-cent gasoline tax for new highway construction has more than justified itself. Since May 26, 1927, when Governor Young signed this measure, 652 miles of entirely new highway have been built from funds provided by it.

OVERHEAD COSTS REDUCED

Overhead costs have been progressively reduced from 5 per cent when the present administration took charge of affairs to 3 per cent.

HIGHWAY PROGRAM ADVANCED TO MEET EMPLOYMENT NEED

Just how immediate has been the response of the State of California to the needs of public work in a period of depression is evidenced by the fact that on July 16, 1930, 80 per cent of the state's highway program for the present biennium (with eleven months of the biennium yet to come) is either completed, under contract or now being advertised for bids.

The care that has been exercised to secure the equitable distribution of these funds is shown by the fact that this figure represents 80 per cent of the budget allotment for work in the southern counties and 80 per cent in the northern counties.

BUDGET SYSTEM CREATES RESERVOIR OF PROJECTS

Through the carefully planned-in-advance building program that follows as a necessary result of the budget system, engineering on highway projects, both in the field and office, has been carried sufficiently ahead of actual

construction that a reservoir of available highway projects was created, which has been heavily drawn upon to assist both in the relief of unemployment and to better marketing conditions for materials and supplies needed in highway work.

PLANNING SYSTEM EXTENDED TO TEN YEARS

The benefit derived from planning highway work in two-year periods has been so thoroughly established that the California Highway Commission and the Department of Public Works are now compiling a report based upon a study of the probable traffic needs of California for a ten-year period. This study will prove of inestimable value to those in charge of administering state highway affairs, and should save the people of the state many millions of dollars in the ultimate cost of the state system.

SAFETY BEING BUILT INTO STATE HIGHWAYS

No state in the Union has a more ambitious program for building safety into its roads than is found in the California highways now being built or brought up to modern standards of alignment, design and construction.

Dangerous railroad grade crossings are being progressively eliminated at a rate which promises in a very few years to entirely free the state highway system of railroad grade crossings.

THREE CONTRIBUTIONS TO HIGHWAY POLICIES

It may be of interest to note that the four years that will close with the end of the present calendar year have seen three outstanding contributions to the administration of state highway affairs. These may be summarized as follows:

First, the resumption of new construction on the state highway system through the adoption of the one-cent gasoline tax measure;

Second, the application of the budget system to state highway expenditures, through which the public is informed of the manner in which it is proposed to spend state highway money in advance of and not after such expenditure;

Third, the adoption for the first time of a definite and orderly policy to govern extensions to the state highway system.

Synopsis of Report on Orderly Additions to State Highway System

Made to Governor C. C. Young in accordance with Assembly Concurrent Resolution No. 16, relative to the orderly addition of new roads to the state highway system, after engineering and economic studies by the California Highway Commission and the Department of Public Works.

Recommendation for the inclusion of twenty-two additional highways into the state highway system were made to Governor C. C. Young on July 24th by B. B. Meek, Director of the Department of Public Works, and the members of the California Highway Commission.

The report follows a fifteen months study of proposed extensions to the state highway system, a study ordered by the last legislature in a joint resolution of the Senate and the Assembly, unanimously adopted by both houses. This resolution directed that the report should be completed and transmitted to the Governor by August 1st.

Under the terms of the joint legislative resolution, all new highways recommended for inclusion in the state system were confined to roads that could qualify in at least one of three classes. These classes were:

1. Roads now carrying a large volume of state traffic;
2. Roads affording relief to heavy traffic on present state highways;
3. Roads serving as important interstate highway connections.

The legislative resolution also directed that the additional mileage recommended for inclusion in the state system should be limited to from 10 to 12 per cent of the 6590 miles now in the state system. It further directed the progressive equalization of the existing disparity in secondary highway mileage between the northern and southern counties (secondary highway mileage of the north is 1778 miles and that of the south 525 miles) by the addition of not less than three or four miles in the south to one mile in the north, without change, however, in the present equal allocation of secondary highway money as between the north and the south.

Under the rules laid down by the legislature, Director Meek and the California Highway Commission have recommended the inclusion of 804 miles of roads into the state system. This constitutes 12 per cent of the present state highway mileage. The mandate of the legislature relative to the distribution of these roads is also followed in that the ratio of mileage is 3.7 miles in the south to one mile in the north.

Governor Young stated today that he would recommend to the coming legislature that the report be adopted by that body. Ralph W. Bull, chairman of the California Highway Commission, stated on behalf of that body, that the California Highway Commission would avail itself of the right, granted to it by the legislative resolution, to include in the highway budget now being prepared provision for the betterment of the roads recommended for inclusion in the state system.

The roads that this report recommends that the coming legislature include in the state highway system are as follows:

IMPORTANT INTERSTATE CONNECTIONS

1. *Mecca-Blythe Highway connections.* (a) To the Arizona state line. The present state highway terminates at Blythe, 4 miles from the Arizona line. It is proposed to include this section in the state system, thus establishing a connection with the Arizona state highway system at the Colorado river. This project lies in Riverside County.

(b) Western terminus of present road to San Bernardino-El Centro Highway. The western end of this road also was without connection with the state highway system. It is recommended that 19.5 miles be added to the system connecting this road on the west with the San Bernardino-El Centro highway. This section lies in Riverside County.

2. *From a point on the present state highway near El Centro to Calexico on the Mexican border.* The northern terminus of this road is near the junction of three state highway routes and lies in the center of the intensely cultivated Imperial Valley Irrigation District. The southern terminus is an important

entrance from California to Mexico. The length of the road is 8.5 miles, all in Imperial County.

3. *Oasis to the Nevada state line.* The state highway (Route 63) from Big Pine to Oasis was added to the state system in the \$40,000,000 highway bond act. Terminating the route at Oasis, 2½ miles short of the state line, was obviously an oversight as the road was intended to afford a connection between the California highway system and that of Nevada. The addition of this section to the state system affords the desired connection and corrects an obvious error. The mileage lies in Mono County.

4. *National City to the United States-Mexico international boundary.* There is no state highway south of San Diego to the international boundary. The traffic between these points, a large percentage of which is state and international in character, is carried over a county road. It is believed that the international connection on the California side should be a state highway. The road down the Mexican coast now extends far, and will undoubtedly be continued much farther. The road classifies for inclusion both on its volume of state traffic and as an international road connection of importance. The length is 10 miles, all in San Diego County.

5. *Bishop to the Nevada state line via Montgomery Pass.* This road is of importance as an interstate connection which utilizes a mountain pass, the superiority of which has been established both by studies of the California and the Nevada state highway commissions. During the winter months it is the most direct winter route between southern California and Nevada. Nevada has been awaiting action by California in making a permanent adoption of the route before undertaking any large program of improvement on its side of the line. The road is 38 miles in length and lies in Inyo and Mono counties.

6. *Alturas to the Oregon line.* This road will connect the California state highway system with an improved highway built by Oregon to the California state line at New Pine Creek. It affords the only state highway connection between California and eastern Oregon. The road will constitute a link in the Yellowstone cut-off and will serve through its connections the various recreational highways in north-eastern California. The road lies in Modoc County and is 34 miles in length.

7. *Quincy to the Nevada state line.* This road forms a connection between the Feather River lateral and the Nevada state highway system. Without this connection full utilization can not be had of the all-year road up the Feather River. The highway from Quincy to Beckwith is being built from U. S. Forest funds and is nearing completion.

Lack of county funds will prevent further improvement between Beckwith and the Nevada state line. The length of the road is 58 miles. It lies in Plumas and Lassen counties.

8. *A connection from the Pacific Highway near Weed to the Oregon state line.* This route forms a connection between the Pacific Highway in California and improved Oregon roads which pass through Klamath Falls and points north thereof. The road classifies for state inclusion as an interstate connection of commercial and recreational importance and as an advantageous alternative and relief highway to the northern part of the state. It is now being built as a joint highway district. The road lies in Siskiyou County.

HIGHWAYS NOW CARRYING A LARGE VOLUME OF STATE TRAFFIC

1. *American Canyon Highway.* This road will make a state connection from the Sacramento, Yuba, Napa and Suisun Valley state highway near Cordelia

to state highway Route 14 in Contra Costa County. Traffic at present takes the county road through Vallejo to Napa junction. This latter road is 5 miles longer than the proposed route and has many railway crossings which will be eliminated by the relocation. The proposed road qualifies for state inclusion because it will be the logical routing supplanting a county highway which now carries a very large percentage of state traffic. The road is 14 miles in length and lies in Solano, Napa and Contra Costa counties.

2. *Walnut Creek to Oakland.* Alameda and Contra Costa counties have organized a joint highway district for the construction of a public highway and tunnel to supersede the present inadequate tunnel road in Alameda County and improve the Contra Costa County road from the tunnel to Walnut Creek. Travel on the present road shows less than 5 per cent local traffic. With the completion of the new tunnel the percentage of local travel to the total volume will be even less. It is proposed that the state take over the portion of this project which lies in Contra Costa County between the tunnel and Walnut Creek, a distance of 9.6 miles.

3. *A highway from Los Angeles to a connection with the San Bernardino-El Centro state highway near Colton.* This route is one of the intermediate routes in the territory bounded on the west by Los Angeles and on the east by San Bernardino and Riverside counties. It follows, in large part, county roads exceptionally well located. Traffic studies plainly show that the character of the travel is such that the importance of including it in the state system is self-evident. The length of this highway is 42.5 miles. The road lies in Los Angeles and San Bernardino counties.

4. *The Jack Rabbit Trail.* The county highway between Riverside and Beaumont, commonly referred to as the Jack Rabbit Trail, is used by many as a short cut between state highways. State traffic now constitutes 69 per cent of the travel on the road. The road is 19.5 miles long and is situated in Riverside County.

5. *Riverside to San Diego (Inland Route).* The Inland Route from Riverside to San Diego is an old established county routing. Riverside and San Diego counties have paved this route, making a serviceable road for light travel. Traffic counts show a very high percentage of state traffic on this highway. Its length is 95 miles, all in Riverside and San Diego counties.

6. *Pomona to Temecula.* The general course of this route shows that it establishes a very direct cut to the Elsinore Lake district and to the Inland Route from the Pomona territory. Traffic count shows that state traffic on this route runs as high as 82 per cent. It qualifies for inclusion in the state system both by reason of its present large state traffic and because of the relief that it would afford to the Coast Route. The road is 56 miles in length and is situated in Los Angeles and Riverside counties.

7. *Cambria to San Luis Obispo.* This road affords a connection between the Coast Route at San Luis Obispo and the Carmel-San Simeon highway at Cambria. The present connection between these two highways is a county road. The completion of the Carmel-San Simeon highway will throw a large volume of state traffic over this road and for this reason the inclusion of this connecting link between two state highways is recommended. The road is 36 miles in length and lies in San Luis Obispo County.

8. *Pomona to the Coast Highway near Fullerton via Brea Canyon.* This road is an established short cut between the territory east of Los Angeles and the beaches and area south of that city, and ultimately will provide a desirable route for truck traffic to the coast. Through traffic now predominates on the road, intercounty and state traffic constituting about 76 per

(Continued on page 27.)

Protection Against the Forces of Nature in California Highway Construction

By C. S. POPE, Construction Engineer, California Division of Highways *

THIS paper deals with some of the more unusual elements from which it is necessary to protect highways in the western states such as floods, cloud-bursts, sea waves, moving sand dunes, and earthquakes.

FLOODS

Floods may be of the type caused by the normal rise of large rivers due to rainfall or by sudden floods in normally dry streams due to cloud-bursts or heavy rainfall. In either case, the protection of highways against destruction is an important problem.

Some of the methods of protection which have been developed in this state include the construction of brush and wire fences, mats composed of wire mesh and gravel, deflecting



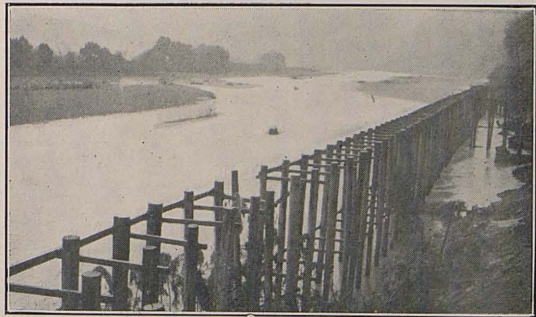
Slope paving and masonry walls.

jetties of stone or piling, and wire mesh, deflecting tetrahedrons of steel or reinforced concrete, sacked concrete riprap, hand laid stone riprap, random riprap, stone filled wire baskets, and slope paving.

CLOUD-BURSTS

Protective structures against cloud-bursts may consist either of a system of dips in pavements providing overflow over aprons and cut-off walls, or may be provided by a system of channels and deflecting dykes designed to pick up the broad but heavy flow occasioned by cloud-bursts and conducting the same through channels over which trestles have been constructed.

* A paper delivered before the American Society of Civil Engineers at its spring meeting in Sacramento.



Deflecting jetty made of piling.

WAVE ACTION

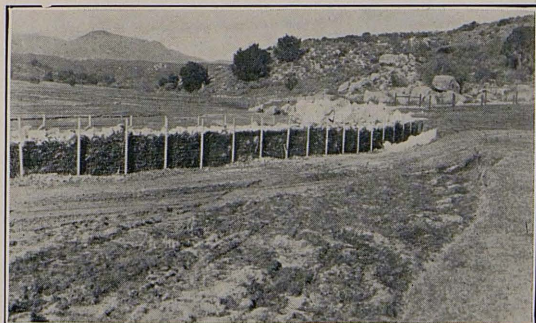
Protective structures for sea waves take the form of booms anchored to piles, heavy random riprap, hand placed riprap, sheet piling of wood or concrete or other bulkheads, groynes of wood or steel, jetties, wave breakers, and slope paving, and sea walls.

SAND DUNES

Protection against moving dunes is generally obtained by a study of their habits and movements. Some may be avoided by a change of location, others by a raise of grade, and others may be removed by wind action or with the use of equipment.

EARTHQUAKES

So far as we have observed, there is no known cure for earthquakes except good construction which includes the use of a suitable number of expansion joints in concrete paving, the clearing of all hillsides of hanging



Protecting banks by brush and wire fence.



Concrete cells.

rock, and solid construction of all fills in earthquake country.

FLOODS

Since a great many of our more destructive floods occur in arid regions and are accompanied by the transportation of considerable amounts of sand which not only prevent solid structures from being used but make them useless for the reason that stream beds are filled up and changed, there has been considerable use of structures of a type which are easily replaced.

BRUSH AND WIRE FENCING

A popular type of protection is the brush and wire fence dyke, which is constructed of two rows of galvanized iron pipe on which wire or fencing is fixed to retain the brush filler which is placed between the rows of fencing. The brush is weighted down with stones to insure its settlement into any washouts which might occur. There has been developed a very definite system of installation of this type of fencing.

STONE FILLED WIRE MATS

A second common practice is the construction of slope mats of wire mesh and cobbles. The slope is first dressed to an even surface and on it is laid a section of wire mesh. A

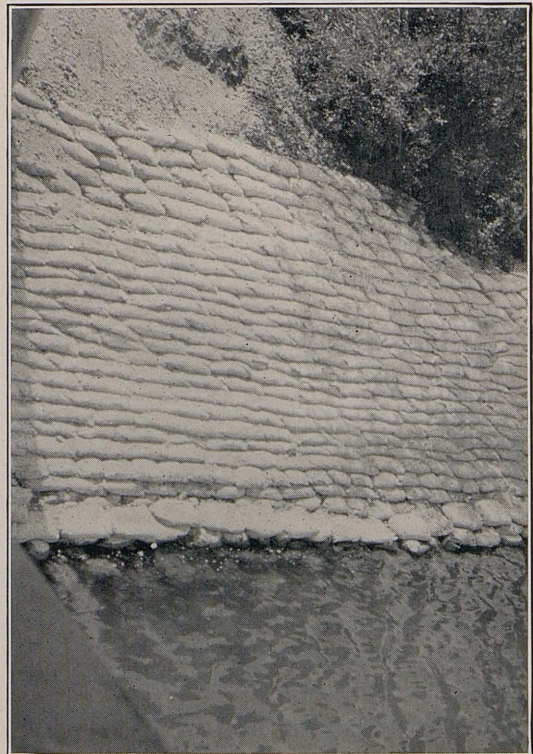


Tetrahedrons that saved the highway in the St. Francis flood.

coating of cobbles 6 or 8 inches thick is laid on the wire mesh and a second wire mesh panel is wired down on top of the cobbles. This construction gives a flexible mat which will, to a certain extent, follow any undulations which may occur due to washouts. It has been extensively used in storm protection work in Los Angeles County, but not to any great extent by the highway organization.

JETTIES

Deflecting jetties constructed of piles with wire mesh nailed to them were at one time considered the most satisfactory type of stream protection, but, at the present time,



Sacked concrete.

their use is confined largely to the northern part of the state where the character of the stream bed is usually more stable than is found in the south. When properly constructed, they prevent bank erosion and are of considerable value.

TETRAHEDRONS

Where the character of the detritus carried by the stream is rather light, such as the Colorado River silt or fine sand, the use of skeleton tetrahedrons of steel or concrete has been found very effective for stream deflection. These tetrahedrons are placed in line

at the location where bank erosion is taking place, completely closing the break, and they are usually anchored with cables to insure their being maintained in position. Their function is to interrupt the flow of the stream in such a manner as to cause silt to deposit in the eddies set up by the obstruction, and their use has been followed by very successful results in many locations. Those used on the Colorado River by private interests were constructed from steel rails 30 feet in length and were used successfully in deflecting this



Wind channels cut in sand dunes.

large stream where other means had not been successful.

On highway work a row of tetrahedrons which had been placed to deflect the stream on the Santa Clara River was the means of saving a considerable section of highway during the St. Francis dam disaster.

SACKED CONCRETE

In locations where large rock was not available, the state has used a considerable amount of sacked concrete placed as riprap in critical locations.

STONE FILLED STEEL BASKETS

In somewhat the same territory, we have also installed, under plans made by the Bureau of Public Roads, metal baskets having a volume of about $1\frac{1}{2}$ to $2\frac{1}{2}$ cubic yards which were filled with stone and placed by means of suitable equipment as bank protection.

SLOPE PAVING

Slope paving has been extensively constructed either by hand placing suitable stone or by constructing slope walls of concrete 4 inches to 6 inches in thickness which extended a sufficient depth below stream bed to be safe. On many streams the use of random riprap of considerable weight has been advantageous as a method of protection.

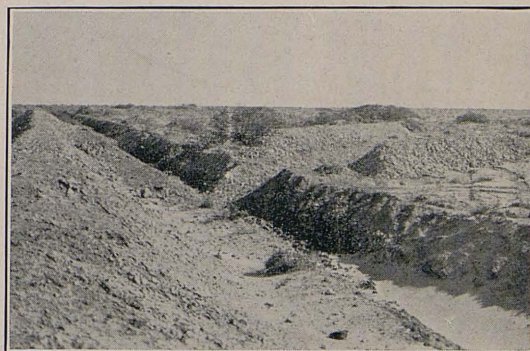
CLOUD-BURSTS

One of the most unusual problems we have

to face is the protection against cloud-bursts. Without having complete data on the subject, it is nevertheless the opinion of some of our engineers that these cloud-bursts occur in approximately the same areas within a reasonable range. Since in many localities the hills and mountains are entirely denuded of any verdure which would retard the flow of water the volumes of water to be handled are very large and the run-off very rapid. The water often appears without previous intimation that a cloud-burst had occurred. The first knowledge which the observer has of the approaching danger is the appearance of a wall of water and mud sweeping down the canyon. The method pursued in the past has been to construct paved dips across all locations where the profile indicated that cloud-burst run-offs were usual. This, however, proved unsatisfactory in many cases because of extreme scour which occurred at the overflow aprons. It seemed practically impossible to check the velocity of the water either by cut-off walls or water cushions.

DEBRIS CONES

The usual formation in sections where cloud-bursts are frequent show the presence of flat debris cones issuing from the canyons or other sources from which the water comes and spreading out fan-wise into the lower lands.



Dykes to protect desert roads.

Taking advantage of this condition, the state has adopted the system formerly used by the Santa Fe Railway in constructing pick-up channels or dykes along the line of the cones in such a manner as to secure greater velocity in the channels than is afforded by the general slope of the country. The channels, of course, must be located close enough to the highway to intercept any considerable amounts of water. The results so far obtained have been extremely satisfactory in restraining all of the water from crossing the highways except at certain designated points, where wooden

(Continued on page 24.)

Receiving Tourists to California

By P. T. POAGE, Assistant Architect

FOR MANY years the State of California, through its Department of Agriculture, has watched and studied the effect of plant pests in other states and in foreign countries. To prevent the disastrous inroad of such pests as the Cotton Boll Weevil, the Mediterranean Fruit Fly, and the Alfalfa Weevil, into this state, a careful quarantine service has been maintained with inspection



P. T. POAGE

stations at all entrances into the state. Millions of dollars are being saved annually through the prevention of such catastrophies as the recent fruit fly epidemic in Florida. Shortly after taking office, Governor Young recognized that the state had both an opportunity

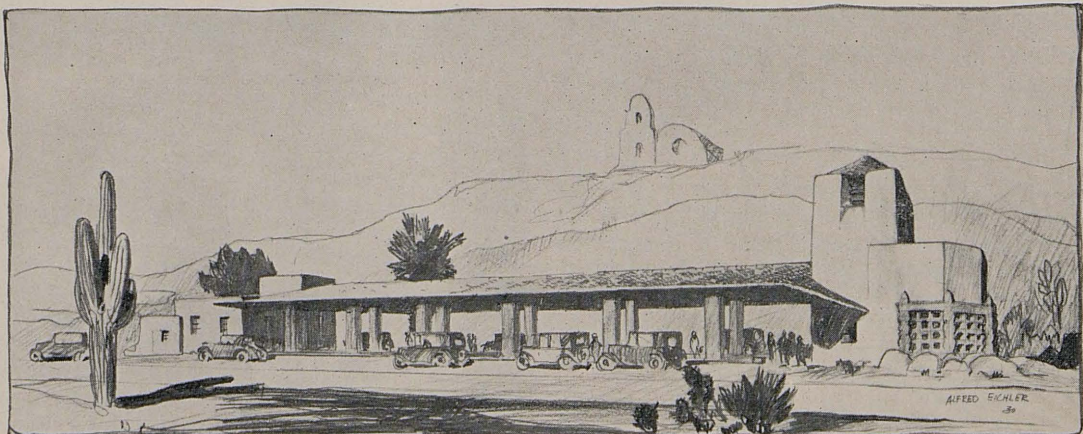
and an obligation to fulfill in this service—an opportunity to create in the mind of the incoming stranger a favorable first impression of California; an obligation to treat the tourist with the utmost courtesy, by explaining carefully the reason for the inspection, and by making the inspection courteously with entire absence of arbitrary authority.

It was apparent that the desired type of service could not be given without more adequate facilities. Thus, at Fort Yuma, Cali-

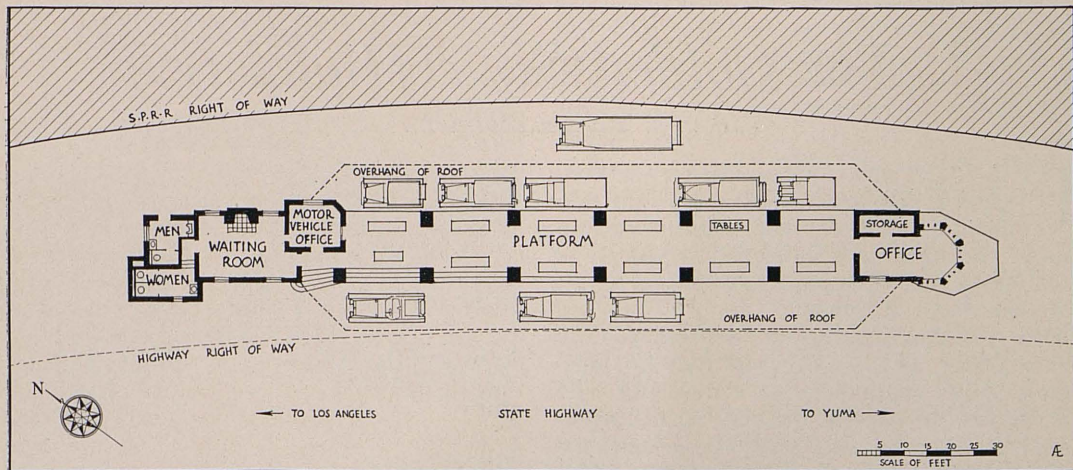
fornia (sometimes known as Winterhaven) immediately across the Colorado River west of Yuma, Arizona, we find, now under construction, the first of California's "Super-Service Stations." This station is being constructed jointly by the Department of Agriculture and the Division of Motor Vehicles, so that in addition to the quarantine inspection, registration of automobiles bearing licenses from other states will be handled, and a general information service will be made available to the traveler.

The selection of a site is of prime importance. No side road which would permit bypassing the station may be permitted to intersect the main highway between the station and the border. At Fort Yuma this has forced the selection of a restricted and difficult site requiring heavy cut and fill, and all but crowding onto the state highway right of way. Nevertheless, when completed there will be adequate room for parking and for handling all of the traffic which may be expected for some time to come.

The building will be long and low, reminiscent of the desert in which it is located. At the east end the horizontal feeling is broken by a tower forming an accent to attract the attention of the motorist. Under the tower is located the office of the agricultural inspectors arranged with windows giving full view of the highway in the direction of the border. This office opens onto a long concrete platform which will accommodate twelve cars lined up on the two sides. A wide tile roof



General view of State Plant Quarantine Inspection Station at Fort Yuma.



Layout of Border Station at Fort Yuma.

supported on steel trusses covers the platform and extends entirely over the cars on either side so that inspection may be carried on in the shade.

At the west end of the platform are quarters for the Motor Vehicle offices, a rest room for the public, and comfort stations for men and women. The rest room has a fireplace on one side and will afford a homelike comfort to the weary tourist while waiting for inspection.

The building walls will be of hollow cement brick, whitewashed to resemble the native adobe brick. The roofs will be covered with an insulating material, which, with the hollow walls will afford a maximum of comfort on the warm summer days of the desert.

Ice cold drinking water will be provided by an electrical refrigerating unit, conveniently located on the platform.

The construction of this station is a major step in the program for a gradual improvement of all border stations. When completed, this summer, California will be able to extend to its guests a real "Super-Service."

WELL, WHY NOT?

Identity of the young lady is withheld, but the memory of her answer lingers on with the instructor conducting a science course at a high school. One of the requirements in the written quiz was: "Define a bolt and nut and explain the difference, if any." The girl wrote:

"A bolt is a thing like a stick of hard metal such as iron with a square bunch at one end and a lot of scratching wound around the other end. A nut is similar to the bolt only just the opposite, being a hole in a little chunk of iron sawed off short, with wrinkles around the inside of the hole."

The startled professor marked that one with a large "A."

State Shows Big Increase in Auto Registrations

Additional evidence that California is the "white spot" of America in business was given in figures compiled by the Division of Motor Vehicles showing that motor vehicle registrations in the state gained more than 6 per cent during the first five months of 1930 over the same period for the previous year.

The net gain in vehicles was 110,828, the total in fee-paid registrations for the five-months period being 1,937,535, as compared with 1,826,707 for the previous year.

The division expects to equal the total for 1929 early in July when registration of many vehicles, held back for various reasons, will have been made.

At the present rate, the percentage of increase for 1930 over 1929 will be far greater than 1929 over 1928.

The gain in passenger cars for the five-month period was 95,071.

Registrations for the five-month period ending May 31st were reported as follows: Passenger cars, 1,804,331; solid tire trucks, 14,322; pneumatic tire trucks, 71,781; solid tire trailers, 8635; pneumatic tire trailers, 30,630; motorcycles, 7836.

Registration fees collected by the division for the period totaled \$8,620,756.

INSTALLMENT PLAN

Young Man—How much do I pay for a marriage license?

Clerk—Five dollars down and your entire salary each week for the rest of your life.

The Golden State Highway

By E. E. WALLACE, District Engineer *

THE PORTION of the California state highway between Los Angeles and Sacramento which traverses the central portion of the state and which is designated as U. S. Route No. 99, is popularly known as the "Golden State Highway."

This is the main artery for all central California travel and is supplemented by more than a dozen main laterals connecting with the centers of population and with various recreational areas, including three national parks. It traverses the San Joaquin and a portion of the Sacramento valleys, providing access to hundreds of thousands of acres of intensively irrigated and cultivated lands, and to vast oil fields. The valley produces great tonnages of supplies, considerable portions of which are hauled over this highway. New recreational territories are being opened in the Sierra region. The Kings River Canyon Highway is one of the larger projects of this kind.

The development of the "Golden State Highway" has been an interesting and important part of the growth of California.

To the early Spaniards and pioneers this was then the Great Interior Desert of California and because of its vastness and lack of transportation facilities, it was a thing to be avoided.

The first settlement of consequence was established at Visalia about 1835. Later, because of the discovery of gold in the Mother Lode country, numerous settlements developed along the pony express trail, which had been located in the foothill country on the easterly side of the valley in order to avoid the overflow lands farther to the west.

With the rush for gold and the accompanying development of agriculture and industries, the Fremont Trail was the next traffic development. This trail connected many of the old mining towns on the Mother Lode and gradually extended to other new developments.

A railroad was then built through the center of this great valley. Wagon roads were constructed paralleling the tracks and crossing them frequently and these same roads



Golden State Highway south of Bakersfield.

were the beginning of the present "Golden State Highway."

The automobile gradually displaced the horsedrawn vehicles and with this displacement the demand for better highways has grown more rapidly than finances could be provided.

These wagon roads were gradually widened and surfaced but the use of the automobile developed even more rapidly than the highways. It is of interest to note some traffic census figures which were taken in the vicinity of Fresno during 1913 in comparison with our traffic count at the same location last July.

Year	Horse drawn vehicles	Automobiles	Trucks
1923-----	657	451	21
1929-----	2	7978	727

Such development demands wider rights of way, higher standards of alignment, elimi-



Old store at Tuttle town, said to have been patronized by Mark Twain. This is on the Mother Lode Highway, which is served by the Golden State Highway.

* Between Sacramento and Turlock, the Golden State Highway lies in District Ten, R. E. Pierce, District Engineer; between Turlock and Lebec in District Six, E. E. Wallace, District Engineer; and between Lebec and Los Angeles in District Seven, S. V. Cortelyou, District Engineer. Data relative to the Golden State Highway in Districts Seven and Ten was furnished Mr. Wallace by District Engineers Pierce and Cortelyou.



Subway at Califa in Merced County.

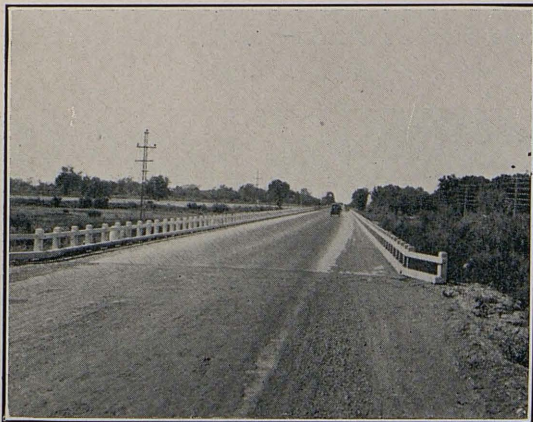
nation of railroad grade crossings, more substantial structures and much more modern types of pavement.

By concentrating all available finances on U. S. Highway No. 99, the State Highway Commission has accomplished much towards providing a modern highway which is adequately handling the traffic, but on which much is yet to be done in order to keep pace with the rapidly increasing traffic.

The original pavement on this route was only 15 feet wide and 4 inches thick. This has been resurfaced and widened to at least 20 feet until at the present time only about 30 miles out of the original 360 remain of the old narrow pavement.

FROM SACRAMENTO TO TURLOCK

The Golden State Highway from Sacramento to Turlock is the main north and south artery through the valley from which branch roads lead to the historic Mother Lode region and the famed recreational areas of the Sierra Nevada Mountains. At Salida the Sonora lateral leaves the Golden State Highway and



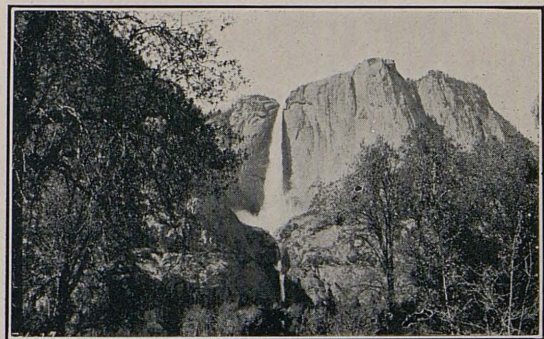
New trestle over Cosumnes overflow in Sacramento County.

about 10 miles west of Sonora the scenic Big Oak Flat road branches off reaching Yosemite Valley from the north and tying into the Tioga road, which lateral crosses the Sierra Nevada over Tioga Pass at an elevation of 10,000 feet.

The Sonora lateral meets the historic Mother Lode Highway at Sonora and continues through heavily forested country of great scenic interest and finally crosses the summit through Sonora Pass at an elevation of 9624 feet.

At Lodi the San Andreas lateral reaches the Golden State Highway and connects with the Mother Lode Highway at San Andreas, being the route through the historic Angels Camp and continues to the Calaveras Big Trees, over the Sierra Nevadas at Ebbetts Pass and into the scenic Alpine County.

North of Galt at Twin City the Jackson lateral leaves the Golden State Highway,



Bridal Veil Falls in the Yosemite Valley.

crosses the Mother Lode Highway at Jackson and continues past Silver Lake and Carson Pass. It crosses Carson Pass, which is famed as the point where Fremont crossed the mountains under the guidance of Kit Carson during the winter of 1844, and thence continues into Alpine County. The Mother Lode Highway extends from Auburn to Sonora and passes through many historic places such as Plymouth, Drytown, Amador City, Center Creek, Jackson, Mokelumne Hill, San Andreas, Angels Camp, Jack Ass Hill (made famous by Mark Twain's book "Roughing It"), Tuttletown and Sonora.

During the past few years many improvements have been made on the Golden State Highway, both in the matter of resurfacing, widening, and in the improvement of alignment. Between Manteca and Stockton the original route via French Camp was relinquished to the county, the state taking over a new route via Hogan and Mariposa roads. Considerable mileage of Portland cement

concrete paving, both north and south of Stockton, is planned for the next biennium work. Four concrete bridges are now under construction and approximately seven miles of concrete pavement in this vicinity.

North of Lodi contracts have been awarded for bridge and approaches to the Mokelumne River. In the vicinity of Arno, between Stockton and Sacramento, a line change eliminated a very poor portion of county road location. This is scheduled for cement concrete paving.

By July 1, 1933, it is expected that the entire Golden State Highway between Sacramento and Turlock will be widened and paved with a high standard 20-foot pavement.

FROM TURLOCK TO LEBEC

Between Turlock and Lebec the Golden State Highway is the main north and south artery through the San Joaquin Valley. There are numerous connecting laterals which lead to national parks in the high Sierras to the east and over the Coast Range and join the coast route on the west. Route 18, the Yosemite lateral, leaves the Golden State



Grading operations on the Newhall alternate line.

Highway at Merced and continues easterly and northerly via Mariposa and the Merced River Canyon. The Pacheco Pass lateral intersects the Golden State Highway at Califa and provides the most direct connection from the central San Joaquin Valley to coast points. At Fresno a county road leading easterly to General Grant Park forms the connection with State Highway Route 41, which is now being constructed as a future route into the Kings River Canyon.

The Sierra-to-Sea lateral crosses the Golden State Highway about one mile south of Goshen Junction. It connects with the coast route on the west and leads to Sequoia National Park on the east.

Route 33 provides a coast connection at Famoso, being a point on the Golden State Highway about 20 miles north of Bakersfield.



Highway tree planting in Stanislaus County.

At Bakersfield the Golden State Highway connects with Route 57, which proceeds easterly through the Kern River Canyon, crossing Walker Pass and intersecting the highway east of the Sierra Nevadas at Freeman, a point north of Mojave. About 20 miles south of Bakersfield, Route 57 leads westerly, passing a short distance north of Wheeler Ridge and leading to the oil fields and westerly through Maricopa, over Cholame Pass, to connect with the coast route.

RECENT IMPROVEMENTS

The Golden State Highway is rapidly being improved to a much higher standard than the old 15-foot by 4-inch concrete pavement of which only 30 miles now remain between Turlock and Lebec. The outstanding recent improvements include a 20-foot cement concrete and 20-foot asphaltic concrete paving between Berenda and the north line of Madera County, the cost of which, including the Califa subway, was approximately \$350,000. Two railroad grade crossings were eliminated in this improvement by locating west of the Southern Pacific and constructing a combined underpass for Routes 4 and 32 at Califa.

(Continued on page 28.)



Line change on present Ridge Route.

Brake Testing Activities

By ANDREW J. FORD, Inspector at Large, in Charge of Bureau of Brakes and Commercial Vehicles

BRAKE testing has become a part of the regular weekly duty of members of the California Highway Patrol and is proceeding in an orderly manner all over the state.

Thus far the campaign has not gone far beyond the "courtesy" stage. It is rapidly reaching the point, however, where actual citations will be issued to motorists whose brakes can not comply with the standards set up by the motor vehicle act.



ANDREW J. FORD.

During the last three months officers have stopped approximately 85,000 cars and examined the brakes. Of these between 10 and 12 per cent were found to be driving with brakes that did not meet the requirements of the law.

This does not represent the actual percentage of poor brakes among all cars operating inasmuch as the officers only stopped a small percentage of the cars on the roads to test their brakes in order to avoid holding up traffic. It is believed that the actual percentage of all the cars operating on the road is much less.

The brake testing campaign has been conducted without any lessening of other activities of the patrol. In most of the counties it has been the custom to set aside certain hours in the week to devote to this work.

The public has shown a marked appreciation of the need of good brakes and has cooperated well. Many have come to the patrol voluntarily and requested that their brakes be examined. Motorists stopped along the highways for the purpose of checking their brakes have, almost without exception, submitted to the tests without grumbling and have been courteous to the officers. Great care has been taken to impress the motorist that good brakes are necessary for his own

safety. Officers have taken care also to impress him with the fact that the state authorities do not care where he has his brakes repaired provided, that after the adjustments are made, the brakes will test up to the requirements of the law.

Along with the actual field work of inspecting brakes has gone the work of checking applications received from all parts of the state for designation as official brake testing stations.

Considerable misinformation was disseminated regarding the state's attitude on this matter which was corrected before the work progressed far. Among other things, the patrol administration has sought to impress the public that it is not recommending, suggesting or prohibiting any type of brake testing or adjusting machine or equipment and has no interest in the various persons who have applied for such designation except to see that they are honest and competent.

In designating such testing stations, the patrol has kept in mind the reputation of the applicant as a business man, the ability of the men employed to do the adjusting, the location of the garage, shop or service station, the demand for such stations in the community and similar qualifications.

Approximately 900 establishments have been designated as official stations to date. These designations were made after a careful personal check by the patrol. Approximately 2000 mechanics have been authorized as adjusters.

In carrying on our brake testing program, emphasis is being laid on the fact that the motorist is not required to have a brake certificate to drive a motor vehicle. It is only after his brakes have been tested and found not to comply with the law that he is required to have his brakes adjusted or repaired and to produce evidence that he has done so.

A motorist who has been cited for defective brakes may secure adjustment at an official brake testing station. He will receive from that station a certificate which he can mail with his citation card to the patrol officer in order to clear his record. If the motorist has his brake adjustment work done at a place other than an official brake testing station, he may satisfy the citation by appearing

(Continued on page 29.)

Important Progress on East Bay Highway

COLONEL JNO. H. SKEGGS, District Engineer

THAT section of state highway between Oakland and San Jose officially designated as State Highway, Route 5, was originally a county road known as the "Mountain road." With its adoption into the state highway system it has gradually assumed the importance to Oakland, San Jose and east bay territory which the Peninsula Highway bears to San Francisco, San Jose and peninsula territory.

The first improvements by the state on this important section of highway were made in 1915, at which time the standard from Hayward to San Jose was an 18-foot width pavement on a 24- to 30-foot graded roadway. The 5-mile section between Oakland city limits and Hayward was taken over by the state from the county already paved 24 feet wide.

By 1924 this highway had assumed such importance that a general program of widening and reconstruction to conform to the rapidly increasing traffic demands of the time, was adopted. Under this widening program the 3.8 miles between Milpitas and Coyote Creek was constructed that year.

In 1928 the 4.3-mile section between Warm Spring and Milpitas was widened in like manner to 30-foot paved width.

The most recent section of this major plan, the 8.7 miles between Hayward and Niles was completed in May of this year. This project called for widening the present right of way from its former width of 40 to 60 feet to a full 100-foot width throughout. Owing to the heavy urban settlements south of Hayward, where the property for 2 miles on both sides had been subdivided into city lots, right of way negotiations call for not only the purchase of highway frontage property, but included much construction in moving and rehabilitating the many residences and light commercial buildings involved. The balance of this section skirts the cultivated hills on the east with an intensively farmed valley floor, extending west to the bay. Right of way problems consisted of some 215 property negotiations in addition to moving and reconstructing about 80 buildings.

Three line changes were made on this section, one of which was more in the nature of a shift made necessary to avoid encroaching upon Holy Sepulchre Cemetery in widening right of way. A second line change bettered

alignment for approximately one quarter of a mile, and was more or less determined by right of way controls. The most important change was that made in the approach from the north to the Niles underpass, where a practically blind reverse curve entrance was eliminated.

Construction consisted of widening, in general on the east side only with an 11-foot width of 8-inch to 10-inch thickness of concrete, and resurfacing the old original 18-foot concrete pavement and 1 foot of the new concrete with a minimum thickness of 3 inches of asphalt concrete. On line changes or slight grade changes three 10-foot strips of 8-inch to 10-inch thickness of concrete were placed. However, where line change involved widening to variable width, 7-inch to 9-inch concrete was placed and 3-inch minimum thickness asphalt concrete 30-foot width or more to cover old and new concrete.

The project thus involved approximately $1\frac{1}{4}$ miles full width surfaced with asphalt concrete, including one-half mile through the business portion of Niles, $1\frac{1}{3}$ miles of 30-foot width concrete, and 6.1 miles of surfacing existing pavement with asphalt concrete and widening on the east with Portland cement concrete. Graded roadbed width is 47 feet with 6-foot shoulder on the east and 11- to 12-foot shoulder on the west preparatory to widening on that side in the future to an ultimate 40-foot paved width centering the 100-foot right of way.

The completion of this project is another step in the progress of the major plan of widening and resurfacing upon the best economic engineering alignment possible between Oakland and San Jose. Not only is this consistent with the traffic demands of this rapidly developing east bay territory, but design has been made with a vision of future construction requirements. Increased visibility has been secured at all intersecting roads and driveways, for this is a fast highway. The wide west shoulder gives the effect of a four-lane highway tending to diminish traffic hazards.

This section of highway holds a particularly important position with respect to east bay communities due to the excellently paved connections at many points leading to both the transbay bridges. Northbound travel is

(Continued on page 23.)

Salvaging Water Waste in the Los Angeles Coastal Basin

THE state-wide water resources investigation authorized by the 1929 legislature is being vigorously pressed through the cooperative efforts of three state and federal agencies, namely, Hoover-Young Commission on California Water Resources, Joint Legislative Water Resources Committee, and the Department of Public Works. Comprehensive engineering investigations are under way in nearly all sections of the state as follows:

One phase of the investigation of particular importance has to do with salvaging present water waste in the South Coastal basin of Los Angeles. This basin occupies an area 90 miles from west to east at its greatest length and 50 miles north and south at its greatest width. It contains 57 incorporated cities, numerous urban communities not incorporated and 2200 square miles of irrigable land or land suitable for residential development. About 2,800,000 people live in this basin or 50 per cent of the population of the state, although the area is less than one and four-tenths per cent of the total area of the state and only seven-tenths of one per cent of the water supply is found here. Population and irrigated area are rapidly increasing.

It should be noted that only seven-tenths of one per cent of the water supplies of the state are found in this region. To amplify the local supply, the City of Los Angeles has constructed its aqueduct for 250 miles to bring in Owens Valley water from the north and now proposes to extend this to Mono Basin still further north in order to reach additional supplies. The Metropolitan Water District is actively proceeding with its Colorado River project to bring in 1500 second feet. Despite the fact that it has been necessary to bring in these supplements from outside, local waters still go to waste in times of flood. There is also a constantly increasing discharge of sewage water into the ocean.

MANY ORGANIZATIONS ACTIVE IN WORK

Many organizations are working to the end of saving local wastes. Los Angeles County

Flood Control District is active in the San Gabriel and Los Angeles River watersheds with the dual purpose of salvage of waste and protection from floods. Orange County Flood Control District has laid out a similar program for Orange County. The Tri-Counties Conservation Association is actively engaged in conservation in the upper Santa Ana watershed. Many water companies, both singly and in groups, have made or are making their contribution to this end. But the matter is complex and the object costly to achieve. Many agencies for research and investigation have been busy on the matter for several years past securing data useful and necessary to final consummation of the salvage of local wastes. The U. S. Geological Survey is measuring stream flow from mountains and waste into the ocean. The U. S. Division of Agricultural Engineering is determining wastes of water by uneconomic plant life and contributions to the supply from rainfall on the valley floors. It is also beginning work looking toward increase in efficiency of spreading water on gravel cones. The U. S. Forest Service is organized to protect the watershed and is doing experimental work looking toward increase in efficiency of watershed cover. The City of Los Angeles is investigating the use of sewage water in industry and agriculture. The State Division of Water Resources has done a great deal of investigational work in gathering and analyzing data to determine amounts of waste, possibility of salvage and utilization of the underground reservoirs to better advantage.

PHYSICAL ASPECTS OF THE PROBLEM

The physical situation may be briefly reviewed: The region is supplied by three stream systems, Los Angeles, San Gabriel, and Santa Ana rivers. About 90 per cent of the water supply is secured from underground reservoirs which have captured and held a part of the wild and sudden floods of the region. The area separates into 29 more or

less definitely delimited underground reservoirs, each one of which is tied in with others so that what is done in one toward water supply affects, perhaps, several others. Each one of these is an individual study which must be combined with the whole to reach an answer. Any attempts at salvage resolve themselves finally into attempt at adding to the natural supply of one or more of these underground reservoirs and utilizing them to better advantage. The water plane in practically all of these has been falling for many years past. Into some, even, salt water is penetrating from the ocean. Water is being pumped from below sea level in 162 square miles of the Coastal Plain, according to recent surveys. Salvage of local waste will be available to some and not to others. An important step in investigation will be the determination of shortage in each basin if such exists, source of water available for it, and the effect of development in one basin on the supply to another.

Local wastes occur by floods, by outflow of sewage into the ocean and by evaporation from a high water plane. Only those flood wastes which originate above a reservoir site can be salvaged unless spreading works can be developed which will function in flood times. Salvage of flood waste and of sewage is a matter of public effort, but salvage of water evaporated from seeped lands may not be. It depends on the particular situation. In most cases reclamation of seeped lands will merely result in their cultivation. In other words a useful draft will be substituted for a waste but on the same land. It may not affect the general situation.

WASTES POSSIBLE OF SALVAGE

Only those wastes which it is believed possible to salvage in whole or in part are listed below. Estimates are as follows:

AVERAGE ANNUAL WASTE			
<i>Estimate of Flood Waste Possible to Salvage:</i>			
Los Angeles River	-----	10,000	acre-feet
San Gabriel River	-----	62,000	acre-feet
Santa Ana River	-----	33,000	acre-feet
		105,000	acre-feet 33%
<i>Measured Sewage Waste:</i>			
Los Angeles and south and west	-----	155,000	acre-feet
Santa Ana outfall	-----	6,000	acre-feet
		161,000	acre-feet 50%
<i>Estimate of Waste from Seeped Lands:</i>			
Los Angeles River	-----	Small	
San Gabriel River	-----	10,000	acre-feet
Santa Ana River	-----	45,000	acre-feet
		55,000	acre-feet 17%
Grand total	-----	321,000	acre-feet 100%

There is also a possibility of salvaging water originating from rain on the valley floor. Present information is not sufficient to determine whether this can be done or to estimate the amount which can be salvaged in this way.

As before stated, plans for salvage of waste flood water are made and actual construction is being actively prosecuted by the Los Angeles County Flood Control District. Plans for salvage have also been made by Orange County Flood Control District. Utilization of other wastes is a matter of study.

EIGHTEEN PHASES OF SALVAGE STUDY

The several lines of investigation which are thought to be necessary are outlined in the following statement. It should not be inferred from the fact that a particular line of investigation is not mentioned that nothing is being done in that line. In fact much work may be in progress. It is merely desired in this memorandum to outline all lines of endeavor which at present appear desirable in order that the matter may be fully presented:

1. Determination of erosion and silting rates, and survey of methods and areas for disposition of such materials.
2. Survey of additional reservoir sites both in mountain and valley.
3. Survey of check dam possibilities and benefits.
4. Investigations to increase efficiency of watershed vegetation.
5. Investigation and survey of spreading works.
6. Investigation of penetration of rainfall on valley floor to water plane.
7. Investigation of noneconomic use of water by plant life.
8. Determination of flood waste into ocean, its quantity and origin.
9. Stream gaging—additional program.
10. Investigation of underground waste into ocean.
11. Investigation of sewage waste into ocean and its utilization.
12. Investigation of intrusion of salt water from ocean and other sources into underground basins.
13. Investigation of shortages in each underground basin of the 29 in the region.
14. Investigation looking toward increased efficiency of operation of underground reservoirs.
15. Investigation of quality of water, both local and imported.

(Continued on page 35.)

Helpful Highway
"Cops"
Commended

Highway Crews
and Road
Beautifiers

Railroad Has
First Auto Crash

Clippings, Letters and Comment

Dealing with State Highways

Heavy Winter
Travel Into
Mother Lode

Redlands High-
way Beautification
Program

Good Road Build-
ing in California
Now on Business
Basis

East Sierras Highway Work Is Praised.

District Engineer F. G. Somner has received the following letter from Geo. M. Wills, general superintendent of the Southern Sierras Power Company:

In connection with my responsibility with the power company, I am required to make frequent trips over the northern end of our system. I begin to travel on the state highway in the vicinity of Inyokern and continue into Mono Basin in the course of my visit to the different hydro plants. Traveling conditions have so greatly improved in the last few years that I wish to take this opportunity of expressing appreciation of the fine work which is being done by the organization over which you have supervision. The work which is being done appears to be of a very high order from an engineering standpoint and the greatest consideration appears to be given to the traveling public while the construction is going on. It occurred to me at the time of my recent trip to Bishop, that the least I could do would be to send you this word of appreciation.

* * * * *

Helpful Highway "Cops" Commended.

Under the heading "Helpful Highway 'Cops'—They Give Assistance as Well as Tags," the *Oakland Post Enquirer* publishes the following editorial:

It isn't a strange and unusual sight these days along the California highways to see a state highway patrolman helping some poor motorist out of difficulty instead of getting him into difficulty with the traffic court.

If you break the law, the motorcycle cop is just as ready as ever to arrest you—only he is apt to do it a little more politely and graciously than in other days.

But if you break your car, or if you run short of gasoline or oil, he is ready to HELP you.

The other day, along the highway between Oakland and Sacramento, there were many speed cops on their white motorcycles. It was a holiday, and they were out in full force. They didn't seem to be very busy arresting people, but they did seem to be busy helping people—carrying a quart of oil, a can of gasoline to a stranded driver, giving a little friendly assistance and advice to lady drivers changing tires by the roadside.

You may say they aren't PAID for doing these things, and that is true.

Nevertheless, this kind of courtesy from the speed

cops probably DOES pay. It creates a more friendly feeling, gives motorists the idea that the state highway patrol is on the road to help them, not merely to pester them.

When Eugene Biscailuz took charge of the state highway patrol a year or so ago he said he would try to improve the relations between the motoring public and the speed cops—and he seems to have done a good job.

* * * * *

Highway Crews to Aid Road Beautifiers.

District Engineer Gibson is quoted as follows in the *Santa Barbara News*.

"If the people who plant flowers and shrubs along the highway, and their number is increasing," said Gibson while on a visit in Santa Barbara, "will notify the highway commission where these plantings have been made, state crews will not only protect the plantings but they will keep down the weed growth and do all in their power to make the plantings thrive. This is an order from the commission and will be carried out wherever the engineers in charge have information upon which to give instruction to his working crews."

Gibson said that the hollyhocks on Cuesta grade in San Luis Obispo County which have won much praise this year were so protected and weeded by state highway crews this spring. Hollyhocks are particularly recommended by the state commission for roadside planting because they bloom throughout the summer, do not die down and become a fire menace and reseed abundantly and widely.

* * * * *

Director Declares Polo Sport Not Social Event.

This from the dispatches of the *United Press*:

Bert B. Meek, director of the state department of public works, is a polo addict—in fact it is his hobby. But no one knew anything about it until recently, when Meek was reported as participating in a game between two teams in Sacramento. Asked why he had kept it a secret for so long, the public works director said: "Until you newspapermen recognized that polo was a he-man game and took mention of it off the society page and put it on the sporting page, where it belongs, I just kept my activities under cover. I don't mind seeing my name on the sport page in this connection, but I won't stand for it in the society column."

Narrow Gauge Railroad Has First Auto Crash.

The Sacramento *Bee* publishes the following dispatch from Grass Valley:

Despite the fact that the Nevada County Narrow Gauge Railroad has numerous grade crossings, crossing accidents up to yesterday had been nil since the advent of the automobile. At the Kress Summit crossing yesterday, however, an automobile driven by Mrs. Fred Bierwagen was struck and badly damaged. Mrs. Bierwagen abandoned the machine when it stalled on the rails and a train was heard approaching from around a curve.

The engineer of the train was able to reduce the speed to such an extent that the machine escaped destruction.

* * * * *

Heavy Winter Travel on Mother Lode Highway.

This is from the Stockton *Record*:

Put this one down in your collection of "Believe it or Not."

Week-end travel to the Mother Lode during the winter is nearly 2000 per cent greater than in the summer time.

H. H. Briggs, president of the Central Valley Council of the State Chamber of Commerce, estimates that winter travel is 20 per cent greater; E. E. Ginn, publicity director for winter sports committee, placed it at 200 per cent, and figures of the State Department of Public Works indicate a difference of 2000 per cent.

Here are the figures—judge for yourself: On a Sunday in the summer of 1929 a total of 120 automobiles passed over the Sonora-Mono Pass road, and on a Sunday last winter more than 2000 cars were checked on the same road. That shows a margin of nearly 2000 per cent.

Of course, winter travel in the mountains is usually confined to Sundays, while summer travel is constant throughout the week.

* * * * *

Redlands Highway Beautification Program.

A letter of appreciation from the Redlands Chamber of Commerce to the State Highway Department, carrying thanks of the district for the planting of palms along the Colton avenue highway, today brought reply from C. H. Purcell, State Highway Engineer, highly complimentary to the Redlands chamber, says the Redlands *Facts*. That organization, he maintains, is responsible for the beautification program.

Mr. Purcell writes as follows to Secretary Isham:

"Please accept my thanks for your letter of May 16 expressing appreciation of our efforts in the final planting accomplished by your community on the road entering Redlands.

We are very much interested in the beautification of our roads, and, while we can not initiate the original plantings, we do assume their maintenance after the first year.

I am very sure your efforts will be amply repaid by the appreciation of the motoring public."

The beautification program for this road was launched a year ago by H. Earl Cromas, chairman of the beautification committee of the local chamber. A conference was called in Redlands to which came representatives of civic organizations from Orange, Riverside and San Bernardino counties, and several members of the state highway commission. At that conference pledges of cooperation for planting of highways throughout the southland were made. The Colton avenue plan is among the first to be tackled. Later the Chamber of Commerce hopes to continue the work along the Ocean to Ocean highway between this city and Beaumont.

* * * * *

Good Road Building Now Permanent Investment.

This editorial is from the Los Angeles *Examiner*:

It has cost California millions of dollars to realign and relocate roads which were unwisely built.

It is very satisfying, however, to know that in the last several years the Department of Public Works, which is building our highways now, is locating them so well as to preclude any further expense excepting upkeep and widening as the traffic grows heavier.

Such careful attention means that our road money is a permanent investment, paying dividends to future generations of Californians, as well as to ourselves.

* * * * *

Highway Hoodlums to Be Punished.

The *Indio News* published the following article:

Traffic officers, deputy sheriffs and officials of the State Highway Commission are out to get a gang of hoodlums who have been stealing and destroying lanterns and barriers in the district where oiled shoulders are being placed on the state highway.

Within the past week more than fifty lanterns have been shot full of holes in the district under construction, thus endangering the lives of the traveling public. One lot of about 20 were brought to Indio and dumped on a vacant lot. Many barriers showing where dirt is piled have been deliberately tipped over.

The offenders are facing a stiff jail sentence if apprehended.

NEW YORK—The Lake Champlain bridge between this state and Vermont is proving an indispensable traffic facility judged by the numbers of automobiles and pedestrians which are using it daily.

PENNSYLVANIA—Paved surfaces tested by the "roughometer" in 1929 proved much smoother than those similarly tested in any previous year. Of 532 miles tested 276 reached the standard "excellent," a gain of 111 per cent.

NORTH DAKOTA—Traffic counts conducted on North Dakota highways show that year-around volume is more uniform on farm-market roads at right angles to railroads than on through highways that parallel the railroads.

Progress Report
of Water Study
Investigations

✦ ✦ ✦
Reports Made to
Joint Hoover-
Young Water
Commission

Review of Recent Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Many
Applications
for Dams Filed

✦ ✦ ✦
Irrigation and
Water Storage
Districts

WATER RESOURCES INVESTIGATIONS

MOJAVE RIVER INVESTIGATION

The principal field work for the season was concluded by June 1st and the results of the work are now being analyzed in the office. All records of the old Arrowhead Lake Water Company are being reanalyzed and will be made public in the final report. These have previously been inaccessible and are of considerable value.

SANTA ANA INVESTIGATION

A committee representing the Cucamonga and Pomona basins was appointed at a mass meeting of representatives of water users to cooperate with the state in investigation of flood control and conservation of Cucamonga, San Antonio, Deer and Day creeks. This committee is functioning efficiently and three meetings have been held.

On Lytle Creek a similar committee was appointed after a mass meeting of Lytle Creek water users at Rialto and one meeting has been held with this committee. This committee is acting in an advisory capacity to the state on these matters.

Some work is being undertaken on the small creeks from Twin City Creek and Lytle Creek which threaten the city of San Bernardino.

Complete analysis of flows in Santa Ana and Mill Creek is being made and also in Lytle Creek so far as possible, to determine whether reservoirs on these streams are justified.

LOS ANGELES BASIN INVESTIGATION

The report previously made by the division to the Los Angeles County Conservation Association was endorsed by the association in executive meeting. Representatives of the association are now making efforts to get the work financed and are preparing to interest the entire basin in the progress of the work when it is started. The matter of a definite program has been outlined by the association for this purpose.

VENTURA COUNTY INVESTIGATION

This investigation was continued on a routine basis during the month. A committee of water users met with the supervisors in regard to securing an appropriation to continue the work during the season 1930-31 on the same basis as heretofore and such support was pledged by the supervisors. The estimated cost of this investigation was \$15,000 per year to be met by equal appropriations from the state and from the county. In making up the budget of the division sufficient funds were included to carry the work forward during the season 1930-31 because it was apparent at

that time that investigation would have to run at least a year longer than estimated because of unfavorable weather conditions during the time of investigation which has made it impossible to get data which are entirely conclusive.

NAPA INVESTIGATIONS

Regular measurements were taken in Napa River and Conn Creek on May 5, 10, 19 and 25, and a special series of measurements was made on Conn Creek on May 11 for the purpose of determining the location and amount of losses and accretions between the dam site and the gaging station.

SANTA CLARA INVESTIGATIONS

Available data in the office of F. H. Tibbetts, consulting engineer, has been obtained with respect to wells common both to the present investigation and that made by Tibbetts and Kieffer in 1920. All wells of the present investigation have been located upon a map and the elevation of ground surface has been obtained for practically all of them.

On June 2d a meeting was held at Gilroy with representatives of water users in cities in the Morgan Hill-Gilroy area. This area is a northern valley of the Pajaro River system and is a continuation of the Santa Clara Valley. The water plane has been dropping alarmingly of late years and irrigation use of water is increasing very rapidly. The interests of these people also conflict with the interests of the Santa Clara Valley to some extent in the use of the waters of Coyote Creek. The meeting was well attended and a great amount of interest and apprehension over water supply is apparent. They were interested in being informed as to different phases of water law of the state and hope to get an appropriation for investigation of the water situation. They were advised that funds are not now available for such an investigation and that the usual practice was for the state to contribute half of the money needed for investigation if local interests would match state funds. They are now proceeding to organization and expect to request that the investigation be taken up at the next legislature.

They were informed by Senator Jones that his conception of the state-wide plan was that areas such as this could expect help in bringing in outside water supply only after they themselves had developed local sources.

PIT RIVER INVESTIGATION

Routine field work was continued throughout the month on this investigation.

SAN JOAQUIN VALLEY INVESTIGATION

Ground Water Investigation: Maps delineating the ground water level in Kern County area for the years 1920 and 1924 to 1929, inclusive, have been completed.

Similar maps for the three years of record covering the area from Kern County north to Madera County are about 50 per cent completed. Additional well observation records have been transcribed, bringing the total number of records up to 4900. A tabulation of intraseasonal fluctuations, high to low, have been completed for the period of record; four units in Kern County and in the Alta, Consolidated and Fresno Irrigation districts. A map has been prepared showing the concentration of pumping plants in the Fresno district.

Land Classification: Classification of minor foothill areas on the Merced, Tuolumne, Stanislaus, Calaveras and Mokelumne River has been completed.

Water Supply Studies: Five studies were made on the San Joaquin River to determine the irrigation yield from that stream utilizing only the waters that are now attached to the grass lands for capacities of diversion canal varying from 1500 to 3000 second-feet.

Main Supply Canals: A meeting of the Engineering Advisory Committee on the San Joaquin Valley investigations was held on June 12th followed by a field trip on the 13th and 14th. The purpose of the meeting was to review different proposed schemes of exporting water from the Sacramento and the San Joaquin Delta to Mendota on the San Joaquin River.

SACRAMENTO VALLEY INVESTIGATION

Water Supply: Tabulations setting forth the full natural run-off and the run-off as would be ultimately impaired by upstream use have been prepared for all the major streams in the Sacramento Basin. Preliminary estimates of the irrigation yields of the Kennett Reservoir on the Sacramento River, Oroville Reservoir on the Feather River, Upper and Lower Narrows Reservoir on the Yuba River, Camp Far West Reservoir on the Bear River, Monticello Reservoir on Putah Creek and Millsite Reservoir on Stony Creek have been made for an estimated maximum deficiency of a perfect seasonal supply.

Water Requirements: Data are being collected and compiled in conjunction with the land classification for the purpose of estimating ultimate water requirements in the Sacramento River Basin. These estimates correlated with the irrigation yields from the reservoirs on the various streams will determine the water surplus, if any, to the ultimate needs of the Sacramento River Basin.

Exploration Work at Kennett Dam Site: Topographic surveys of the Upper Narrows and Coloma dam sites have been completed during the past month. Exploration work at the Kennett dam site is progressing rapidly under the direction of the U. S. Army engineers.

SALINITY INVESTIGATION

Office work on salinity investigations during the past month has been continued on the preparation of final maps, diagrams, tables and compilations for the report. The analytical studies on the relations of salinity to tidal action and stream flow are practically completed, and the report of the results of these analytical studies is under preparation.

Field work on salinity investigations has been confined to the maintenance of the regular salinity observation stations and the automatic tide gage stations.

SALT WATER BARRIER INVESTIGATIONS

Work was continued during the past month on the field surveys of industries, public water supplies, industrial water front structures and agricultural development. The industrial survey, together with that of the public water supplies and industrial water front

structures is largely completed. Surveys have been made of 120 industries in the area extending from Brentwood and Isleton on the east to Richmond on the south and west. Of these, questionnaires have been completed on 65 and the remaining number have been completed except for final executive approval from head offices of the various companies. Sixteen public water supply systems have been surveyed and complete data obtained on 14. Surveys have been made on 221 industrial water front structures and data completed on about 75 per cent of this number. Work on the survey of the agricultural development, especially the reclamation features in the delta of the Sacramento and San Joaquin rivers has continued during the month in cooperation with Mr. George A. Atherton and other representatives of the delta reclamation districts.

The special studies on the geology of the various proposed sites of the salt water barrier have been continued in consultation with our Consulting Geologist, Prof. C. F. Tolman of Stanford University. In addition, another special study has been started during the month on evaporation and transpiration in the bay and delta area; this work is being done under the direction of Mr. Charles H. Lee, Consulting Engineer of San Francisco.

The cooperative work on the investigation by other state departments and the federal government has continued during the past month, including the intensive investigation of the U. S. Army Engineers on the problems of navigation and flood control, tidal and silt studies, and the studies of sewage and industrial waste pollution by the State Department of Public Health, and studies of the possible utilization of the barrier as a highway crossing by the Division of Highways.

MISCELLANEOUS INVESTIGATIONS AND ACTIVITIES

A report on water supply for a women's prison in Brite Valley has been completed and submitted to the Director of Finance and to the committee in charge of the work of selecting a prison site.

Considerable time has been spent in the preparation of a bibliography, history and resume of all cooperative investigations (engineering) in which the state has been interested since 1900. In addition, an outline of present cooperative projects is being made to show statutory authorization, appropriations, contracts or agreements, description of projects, supervision and reports, and budgets and accounting. This work is still in progress.

The collection and compilation of data for a report on Sacramento River riparian lands and use of water on them both for normal and flood flow conditions has been completed.

HOOVER-YOUNG COMMISSION

The seventh meeting of the Joint Legislative Water Committee and the Hoover-Young Commission convened at Hotel Oakland, Oakland, on June 10, 1930, with an excellent attendance by members of both the legislative committee and the commission. There were present in addition numerous interested individuals from the public.

Assemblyman Wm. P. Jost, chairman of the Legislative Fish and Game Committee, requested the support of the committee and commission for increased state and federal appropriations for migratory game refuges. He also presented and filed proposal and recommendation of the Wild Life Development League for Manley S. Harris, president.

Mr. Jas. P. Burke of Visalia submitted data showing increase of areas affected by receding ground water

levels in the San Joaquin Valley, and described the water situation as it affected the four northern San Joaquin Valley counties. Copies of his brief with maps submitted by the San Joaquin Counties Water Committee were filed with the commission and legislative committee.

Mr. H. F. Ormsby, secretary of the California Development Association, submitted a proposal that a representative be recommended to attend for California at the Salt Lake Conference of 11 western states to be held June 26-30, 1930. After a consideration of the request, it was decided that the commission should not be represented, but a motion was adopted instructing the secretary to communicate with the State Chamber of Commerce regarding the desirability of the chamber sending a delegate or delegation to the Salt Lake City conference.

A communication from Mr. Fred G. Stevenot, Director of Natural Resources, requested an appearance before the committee and commission at some future hearing, the date to be set at the convenience of the committee and commission.

Mr. V. S. Barber appeared for the Mining Association, stating that possibly they may later request a hearing on the "Relation of the state-wide plan to hydraulic mining."

SNOW SURVEYS

Work in this connection during the past month has been confined chiefly to office computations. All 1930 snow survey notes and computations were checked and results tabulated in proper form for later analysis. Tabulation of all available snow survey data for previous years has been completed. Curves and diagrams are in course of preparation for use in studying the relation between snow, precipitation, temperature, and run-off for each basin. In the field, certain courses in the Feather Basin have been relocated as shown to be necessary by the 1930 surveys. Supplies and equipment have been brought in for storage from certain of the shelter cabins now accessible by auto. Surveys were made in the latter part of May at the Mount Shasta course (elevation 8000) and at Kaiser Pass course (elevation 9200) in the San Joaquin Basin. These showed a melting of the April 1st pack of 27 per cent for the Shasta course and 69 per cent for the Kaiser Pass course.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

The regular field work is in progress with three engineers handling all measurements of stream flow and return flow and recording all diversions in the Sacramento-San Joaquin area. A fourth man is dividing his time between field and office work in bringing all necessary mapping, tabulations, files, etc., up to date. In studies of the San Joaquin Valley return water it appeared that more data were needed on the return in the early and late parts of the irrigation season. For this reason the San Joaquin return water measurements were started earlier this year and all gages were installed and in operation before June 1st.

On the investigation of the delta consumptive use of water (cooperative with Division of Agricultural Engineering, U. S. Department of Agriculture) one engineer is resident at King Island and gives full time to the work. Supervision is given by Major

Stout from the Berkeley office of the U. S. Department of Agriculture, who is also preparing a detailed and final office report on the delta consumptive use of water. This report is due in August and it is expected that the present season will see the completion of the delta investigation.

The field work of the salinity investigation has been continued with the maintenance of regular salinity observations at twenty-seven stations and sampling of drainage water at seven stations. Maintenance of the nine new stations established late in February in the north San Pablo Bay area has been continued. The encroachment of the salinity as the summer advances will be carefully observed by the establishment of all stations required to properly record the upstream movement. Six tide gages are being maintained by the Water Supervisor's force and fifteen by cooperating agencies.

On June 10th the discharge of the Sacramento River at Sacramento was 10,900 second-feet and the San Joaquin River near Vernalis was flowing 3600 second-feet, making a combined flow of 14,500 second-feet. The corresponding Sacramento, San Joaquin and combined discharges on June 10, 1929, were 7360, 3670, and 11,030 second-feet, respectively.

Bulletin No. 23, Report of the Water Supervisor for the five years, 1924 to 1928, should be received from the printer and be available for distribution early in August.

IRRIGATION, WATER STORAGE DISTRICTS

During the present month visits of inspection have been made to the following districts in connection with their construction progress, water supply, financing and economic problems:

Ladera Irrigation District	Riverside County
Fallbrook Irrigation District	San Diego County
Vista Irrigation District	San Diego County
La Mesa, Lemon Grove and Spring Valley Irrigation District	San Diego County
Palmdale Irrigation District	Los Angeles County
Little Rock Irrigation District	Los Angeles County
La Canada Irrigation District	Los Angeles County
Merced Irrigation District	Merced County
Hollister Irrigation District	San Benito County
So. San Joaquin Irrigation District	San Joaquin County
Linden Irrigation District	San Joaquin County
Richvale Irrigation District	Butte County

Under date of June 17, the State Engineer reported unfavorably to the Board of Supervisors of Butte County in the matter of the formation of the proposed Rio Seco Irrigation District, comprising approximately 8000 acres of land located in Butte County.

The State Engineer has reported favorably to the California Bond Certification Commission upon request of the El Camino Irrigation District for validation of \$7,000 par value of their bonds and authority for the sale of these bonds, and approval of an expenditure of \$7,000 for the purchase and installation of well equipment required in the development of the project.

The request of the Linden Irrigation District for authority to proceed with a bond election in the amount of \$140,000, the funds from the sale of which are to be expended in the development of an irrigation supply, is now under consideration of the State Engineer.

DAMS

Applications Received for Approval of Plans and Specifications for Construction or Enlargement:

Dam	County	Owner	Estimated cost
*Bear Gulch	San Mateo	Bear Gulch Water Company	\$73,000 00
**Benbow	Humboldt	Benbow Power Company	45,600 00
**Webber	Creek	El Dorado El Dorado Irrigation Dist.	300,000 00

An increased activity in dam construction is evidenced by this list of applications. The largest new project coming before the office during this period is that of the El Dorado Irrigation District, which proposes to build an earthfill dam on Webber Creek to replace their former structure. The new dam will be nearly 150 feet in height and have a storage capacity of 6000 acre-feet. This will materially increase their present storage and provide for the growing demands of this locality.

Plans were received and approved for repair and alteration of the following dams:

Dam	County	Owner
Hillside	Inyo	Hillside Water Company
Fuller Lake	Nevada	Pacific Gas and Electric Company

Orders authorizing use have been issued pending completion and issuance of approval for the following dams:

Dam	County	Owner
Salt Springs	Amador	Pacific Gas and Electric Company
Lyons	Tuolumne	Pacific Gas and Electric Company

Mulholland Report:

On November 15, 1929, the city of Los Angeles filed application for approval of the Mulholland Dam. Because of the widespread discussion of the safety of this structure, its location with respect to Hollywood and the many technical features involved, the State Engineer appointed a consulting board to advise on the technical considerations of the structure.

The final report of the board was received on April 18, 1930. On April 22, the city filed a new application, in lieu of the one made in November, for approval of certain proposed changes in Mulholland Dam: namely, to construct a spillway 35 feet lower than the present spillway, to construct an extensive earth and rock fill adjoining the downstream face of the dam, and to provide openings in the dam to limit the quantity of water that can be stored. These proposed changes, not requiring additional geologic information, the State Engineer requested the engineer members of the board to review and report upon the engineering features of the plan accompanying the new application.

Based upon the findings of the Consulting Board, supplemented by the report of the engineer members of the board, the State Engineer on May 6, 1930, approved the application filed by the city for modification and betterment of the existing structure.

The findings of the board may be best stated by quoting from the conclusions of the two reports. Concerning the existing structure the board concludes as follows: "In accordance with its purpose, the board has based its opinion entirely on engineering and geologic data and considerations. A favorable location in Weid Canyon was selected for this dam, and the precautions taken in construction were sufficient to meet the actual engineering needs. Although the foundation rock is affected by small fault slips, its physical condition is otherwise good, and there is no reason to expect that it will deteriorate appreciably due to the

*Enlargement.
**Construction

conditions imposed by water storage. In the opinion of the board, therefore, the Mulholland dam is safe."

Concerning the proposed alterations the engineer members of the board state, "The proposed embankment of mixed rock and earth, efficiently drained, placed against the downstream face of the Hollywood Dam to elevation 715 feet will increase the safety of the dam."

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

Flood control project maintenance work during this period has been mostly routine and consisted of repairs to structures, cutting weeds, making fire breaks and irrigating willows. No construction is under way.

Two dragline excavators have been engaged in cleaning the canals of the drainage system. One dragline excavator completed its work on June 11 and the work of the other machine will be completed in a few days.

FLOOD CONTROL PROJECT MAINTENANCE, BANK PROTECTION

The work of bank protection on the right bank of the Sacramento River near Princeton in cooperation with Reclamation District No. 2047, consisting of two tree current retards, has been completed at a cost of \$6,000.

Bids were opened on June 5 for the construction of a sand fill and river levee pavement at Isleton, in cooperation with the Division of Highways. The low bid was submitted by O. G. Richtie of San Jose and the contract has been awarded to him at a price of \$7,208.65.

Arrangements have been made for the repair and enlargement of six tree current retards on the right bank of the Sacramento River at Hamilton Bend, near Colusa, in cooperation with Reclamation District No. 2047, at a cost of \$7,000.

Arrangements are being made for additional bank protection work on the San Joaquin River at Tom Paine Slough in cooperation with the California Irrigated farms, to cost \$600.

SACRAMENTO FLOOD CONTROL PROJECT

Timber clearing work in the Sutter By-pass has continued with a force of approximately seventy men, and two camps are in operation. All of the money available for this work out of the Joint Navigation and Flood Control Project Fund for this fiscal year will be expended by July 1. Surveys of the area cleared are being made and mapped.

Of the five contracts for clearing timber in the Feather River overflow near Marysville one is completed and the others are well toward completion, except in some portions of the area where it is at present overflowed with water.

A number of reports on applications have been prepared for the Reclamation Board, and one meeting of the board was attended by the Deputy in Charge of Flood Control and Reclamation. The Deputy in Charge of Flood Control and Reclamation also attended two meetings of the Construction Committee of the Flood Control Association.

RUSSIAN RIVER JETTY

The construction of the timber and pile portion of the jetty has continued throughout the period with a

force of eleven men, and an additional force of five men operating the quarry and railroad depositing rock along the structure. The timber portion of the jetty has now been extended approximately 240 feet this spring, and it is planned to extend it 60 feet further. The channel through the bar is now open along the north side of the jetty.

NAVARRO RIVER JETTY

Bids were opened on June 5 for the construction of a rock jetty at the mouth of the Navarro River in Mendocino County and the low bid was submitted by Christie and Allen of San Francisco and Fort Bragg. The contract has been awarded to this firm at a price of \$4,575. Construction work will be commenced in a few days.

WATER RIGHTS

During the month of May there were 25 applications to appropriate water received, 13 canceled, and 22 approved. Fourteen permits were revoked and three licenses issued.

ADJUDICATIONS

Shasta River (Siskiyou County): The Long Bell Lumber Company's exception relative to water rights on Beaghan and Boles creeks was heard in the superior court of Siskiyou County on June 13, 1930. This was the final hearing on the exceptions filed in the Shasta River adjudication proceedings. The entire proceedings are now before the superior court awaiting the court's decree.

Whitewater River (San Bernardino and Riverside Counties): Still pending in the superior court of Riverside County awaiting developments in regard to the proposed All American Canal from Colorado River.

North Cow Creek (Shasta County): Submission of referee's final report still being withheld pending negotiations now in progress towards settlement of one of the important issues.

Oak Run Creek (Shasta County): Case still pending in superior court of Shasta County awaiting the entry of a decree in the North Cow Creek case.

Clover Creek (Shasta County): Case still pending in the superior court of Shasta County awaiting the court's pleasure in placing it on the calendar.

Butte Creek (Siskiyou County): Case still pending in the superior court of Siskiyou County awaiting action by the parties involved.

Los Alamos Creek (Santa Barbara County): Action by referee being deferred awaiting the outcome of the circulation of a stipulation for consent judgment among the parties involved.

Davis Creek (Modoc County): A stipulation for consent judgment is being circulated among the parties who were not present at the water users' meeting held at Davis Creek on March 18th.

Mill Creek (Modoc County): The trial schedule of distribution proposed by the Division of Water Resources was administered by a water master throughout the month.

Deep Creek (Modoc County): The field investigation of water supply and use of water was continued throughout the month. The plane table survey of the irrigated lands which was commenced on May 6th, was completed on May 24th.

Franklin Creek (Modoc County): The case of *C. E. Crowder vs. P. Indart et al.* involving the deter-

mination of the water rights on Franklin Creek, Modoc County, was referred to the division by the superior court of Modoc County by order of reference dated June 10, 1930.

WATER DISTRIBUTION

Davis, Emerson, Mill, Owl and Soldier Creeks (Modoc County): Water master service on these streams was continued throughout the month.

Little Shasta River (Siskiyou County): Water master service on this stream was continued throughout the month.

Pit River (Modoc and Lassen Counties): Supervision over diversions from Pit River in Big Valley was continued throughout the month by the resident engineer on the Pit River Investigation. The Big Valley Water Users Committee met with the resident engineer on May 31st. General river conditions were discussed and plans outlined for the following month's distribution.

Hat and Burney Creeks (Shasta County): Water master service on these streams was continued throughout the month.

North Cow, Oak Run and Clover Creeks (Shasta County): Water master service was commenced on these streams for the 1930 season on June 1st and involves the distribution of water to approximately 2900 acres of land.

IMPORTANT PROGRESS ON EAST BAY HIGHWAY

(Continued from page 14.)

afforded quick access to San Francisco via the San Francisco Bay bridge and the Bayshore Highway. Southbound traffic enjoys equally good connections with the Dumbarton Bridge leading to Palo Alto and adjacent peninsula territory.

Construction costs of this section between Hayward and Niles were approximately \$352,000, exclusive of engineering. The Hanrahan Company of San Francisco were the contractors. W. A. Rice was the resident engineer.

The trouble with
Our traffic rules
Is they're no good
At stopping fools.
—The Cincinnati Enquirer.

"Really, I can't play golf," the sweet young thing said. "I don't even know how to hold the caddy."
—Dreaverd.

"There's something wrong. This gear shift doesn't work."

"That isn't the gear shift, Jack. It's—er—it's my knee."

A colored agent was summoned before the insurance commissioner.

"Do you know," said the commissioner, "that you can't sell life insurance without a state license?"

"Boss," said the darkey, "you suah said a mouf-ful, I done learned I couldn't sell it, but I didn't know the reason."

PROTECTION AGAINST FORCES OF NATURE IN CALIFORNIA HIGHWAY CONSTRUCTION

(Continued from page 7.)

trestles are constructed along the highway for the passage of streams.

DYKES

In open valley locations where the cones are not so well defined or act only as feeders, it has been necessary to construct extensive dyke systems and to conduct the water under the highway by means of large culverts or trestle structures.

SEA PROTECTION

The sea has been a constant menace to construction in many localities but it is quite usual that highways may be located where this danger is averted. However, in a number of places considerable sections of highway have been located along the sea and it has been necessary to provide structures for its protection.

RIPRAP

Random riprap with the majority of stones weighing not less than five tons has been used to some extent on highway work, but the type of equipment makes the handling of heavy stones extremely difficult. This situation arose in connection with certain work in southern California along the rocky coast north of Santa Monica.

CONCRETE CELLS

It was decided that since large rock could not be handled at the site of the work that concrete boxes or cells should be constructed which could be lowered into place and afterwards filled with concrete to increase their weight. The shore line at this location consisted of rocky bluffs with a steep slope into deep water. It was possible to place the concrete cells along the low tide line but owing to the heavy run of the sea, it would have been impossible to have built slope walls without some protection. Accordingly, such leveling and draining as was possible was done at low tide and the concrete cells were then sunk into place on the prepared foundation and were filled with concrete and heavy stone between tides. Behind the protection of the concrete cells it was then possible to excavate for the construction of a toe wall on which the reinforced concrete slope wall could be placed. This slope wall was made 9 inches in thickness, heavily reinforced and was capped by a wave deflecting section intended to throw

the waves back on themselves. Previous to placing the slope paving, a bedding of stone was roughly laid on the earth slopes. The work could only be done during periods of calm weather and on this account was handled by day labor. It has now survived a number of heavy storms and the protective work may be said to be a success.

SHEET PILING

The use of sheet piling on state work has never met with much success and it has not been used extensively in sea protection.

GROYNES

Groynes have been extensively used along the south coast and the beach has been restored in many locations by their use. The state construction usually contemplates the use of wooden structures but some of the private beach owners have used steel sheet piling with considerable success. These structures are usually placed at slightly less than right angles to the drift of the current, carry sand and are placed at approximate high tide elevation. The most successful are built of two lines of sheeting properly braced and filled with rock.

SEA WALLS

In one or two locations, the state has constructed heavy sea walls of monolithic concrete of sufficient strength to withstand the action of the heaviest waves. These have been built with the usual throw back design of top which has proved effective wherever tried.

SAND DUNES

In a number of locations in this state we have been faced with the problem of control or elimination of sand dunes which have constituted not only a serious burden on our maintenance but have been extremely dangerous to traffic. It is quite usual for a sand storm to, within a few hours, place a dune across the highway several feet in depth which would require constant labor to remove. On one particular dune the state had an annual expense of about \$7,000 for keeping the road clear over a section of a few hundred feet. A study of the habits of dunes and their movements made over a number of years demonstrated that they could be conquered if proper means were used. It was found that in many given localities the majority of the dunes moved in a certain direction and attained a height which was seldom exceeded. By the construction of a high grade line over the worst section of dune, the engineer entirely eliminated all dangerous drifting and we now have a road which is clear at all times.

In another location a study of the dune indicated that it could be removed by wind action by cutting channels at suitable locations. This work was done and the dune was removed at a cost of a few hundred dollars and the removal of similar dunes has since been accomplished by the same method at a very low expense to the state.

EARTHQUAKES

As you are, no doubt, aware, certain parts of California are visited by earthquakes from time to time and these offer an unusual problem to the highway engineer. Some of us are of the belief that a number of our concrete highways have been shattered by these disturbances and we believe that the construction of proper expansion joints will eliminate this danger. We have also found it necessary to construct our fills in earthquake country to the greatest solidity and also to clean up slopes so that there are no hanging rocks in any location. On one of our jobs we suffered a loss due to combined earthquake and cloudburst of over \$30,000 in one storm which brought down enormous boulders on a section of highway some eight miles in length. During the Santa Barbara earthquake, we found that our highway had been shaken from side to side until there was a gap some four inches wide along each side of the highway in the vicinity of Santa Barbara. The highway had also buckled at a number of locations and had settled at bridge abutments. Generally speaking, however, the danger due to earthquakes is not serious so far as highways are concerned.

The foregoing outline of the problems which have been overcome by the engineers of the Division of Highways indicate only a few of the very interesting and important problems which they are given to solve in the routine course of highway construction.

A fraternity had sent its curtains to be laundered. It was the second day that the house had stood unveiled. One morning the following note arrived from a sorority across the street:

"Dear Sirs: May we suggest that you procure curtains for windows? We do not care for a course in anatomy."

The chap who left his shaving to read the note answered:

"Dear Girls: The course is optional."

"Has anyone ever been lost in crossing here?" asked a timid woman who had hired a boatman to ferry her across the river.

"No'm," was the reply, "Mah brother was drown'd heah las' week but they foun' him the nex' day."

Overheard as a somewhat flustered young thing descended from the sedan: "Say, Mayme, I see you been on the rumple seat."—*Boston Herald*.

A LEGAL RIDDLE

Udoxes contracted to instruct Harmonius in rhetoric. The arrangement was that Harmonius should pay a fee in two installments. The first was to be paid at once. The second was conditional on Harmonius succeeding in his first case; should he lose, then he could consider his instruction poor and the second installment canceled. He paid the first installment and was duly instructed, but failed altogether to practice. Becoming impatient at the delay, after two years had passed Udoxes sued him for the balance of the fee. He argued thus: "If I win this suit, then Harmonius must—by judgment—pay me. If I lose it, then he will have won his first suit and will still have to pay me." It seemed that he was in an unsailable position. Harmonius, however, argued otherwise. "If Udoxes wins the suit against me, then I shall have lost my first suit and need not pay him. If, on the other hand, I win the case, then by judgment of the court I need not pay him."

History does not relate the result of the suit.—*London Times*.

VACATION TIME

Warm days comin' back again,
Song birds singin' in de lane,
Sly ole turtle on de rock
Got his little eyes half cock
At ole 'gator crawlin out
On de bank to move about.
Warm day sun's a-shinin' hot—
Orter work, but 'druther not—
'Druther lay right down an' sleep
In de clover sweet an' deep.
Sky looks sich a pretty blue,
Cow gives sich a lazy moo.
Bees go buzzin' lazy by.
I kain't work, suh, ef I try,
Got to hit de woodland track—
Wid warm days a-comin' back.

—*Florida Times-Union*.

MICHIGAN—This state will be one of the first to establish an organized system of marking county highways in such manner that they will "key in" with the state system of numbering.

MASSACHUSETTS—A by-pass in Andover and North Andover to route traffic away from the main street is being contributed by a number of public-spirited citizens who are making a gift of the land required and are bearing the cost of engineering work involved.

QUEBEC—The coming winter will see many of Quebec's highways open to year-round traffic for the first time as the economic necessity of all-year motor communication is being realized.

"Gosh," exclaimed the young doctor, looking at that car he was thinking, thinking, thinking, of buying, "the mere sight of it sets up violent cardiac disturbances, superinduces dryness of the palate, epiglottis and larynx, brings on symptoms of vertigo and raises the diastolic blood pressure 20 centimeters."

Officer Seizes Severed Jugular; Saves Auto Victim

An almost superhuman bit of first-aid work by State Traffic Officer Chris Reed may have saved the life of Mrs. Helen Emrie, wife of the trainer for the Agua Caliente stables, whose jugular vein was severed in an automobile crash three miles south of Chula Vista, says a recent issue of the San Diego *Union*.

In the same crash two veteran jockeys, Eddie Taplin and Walter Martin, were less seriously injured.

Mrs. Emrie was thrown through the windshield in a collision between two cars, and her throat was cut literally from ear to ear. The jugular vein was severed, and there were lacerations of the forehead and temple.

STOPS BLOOD

Reed, who was first to arrive on the scene, gathered the spouting jugular between his fingers and pressed until he had stopped the blood. He held the severed vein while Mrs. Emrie was lifted into an ambulance and he held on during the six-mile race to the Paradise Valley sanitarium.

There, it was said, she has an even chance for recovery. Dr. A. D. Butterfield, after more than an hour's work in patching the severed vein, said that Mrs. Emrie would almost certainly have died had Reed not resorted to heroic emergency treatment.

Later news reported that Mrs. Emrie was fully recovering.

Heed Warning Sign "Men at Work"

J. N. Byers, while working on the state highway south of Madera, was struck by an automobile and suffered injuries from which he died the same evening. This unfortunate accident occurred on Saturday, July 12th. Another maintenance employee, M. Reta, was also severely injured, but will recover.

Both of these men were employed in spreading gravel on newly oiled patches on the pavement. "Men at Work" signs were displayed and the state truck carrying the screenings was standing in front of the men. Despite these precautions, the car crashed into the men, caromed from the rear of the truck, carried Mr. Byers 75 feet across the road and then collided with a tree.

Purcell is Named on International Highway Committee

State Highway Engineer C. H. Purcell has been appointed a member of a new committee organized by the American Association of State Highway Officials and to be known as the Committee on International Highway Relations. The chief purpose of this committee is to cooperate with the adjoining nations on all roads being constructed, meeting at the borders. These roads will be known as national highways without designation and no particular road will be given a title, as for instance—Pan American Highway, or Canadian-United States Highway. In this connection, several points of entry have already been designated by agreement with the Mexican officials and the officers of the association. It is hoped that definite agreements may also be secured with the provinces of Canada.

COMPLETE NUMBERING OF U. S. HIGHWAY ROUTES IN 1930

Reports received by the Bureau of Public Roads, U. S. Department of Agriculture, indicate that the work of erecting the standard markers for numbered routes in the United States System of Highways will be practically complete at the end of the construction period of 1930. The system was adopted less than five years ago by state highway departments, and comprises approximately 97,000 miles of the most important highways of the nation. Practically all of these routes are also in the federal-aid highway system.

All east and west highways, as well as their branches, have even numbers; all those running north and south with their branch lines have odd numbers.

Cop: Lady, don't you know this is a safety zone?
Woman Driver (in difficulties): Of course—that's why I drove in here.—*Missouri Pacific Magazine*.

A forest of 10,000 young trees was recently planted near Bolton, New York, in honor of the late Stephen T. Mather, former director of the National Parks Service. The trees, white pines, were furnished by the New York Conservation Department.

The driver, a girl 16 years of age, collapsed from the shock, necessitating her removal to a hospital. The motoring public can show no greater appreciation of the efforts of the maintenance crews to maintain the state roads in first-class condition than by careful driving and avoidance of injury to the men who daily risk their lives to contribute to the comfort of the motorist.

SYNOPSIS OF REPORT ON ADDITIONS TO STATE HIGHWAY SYSTEM

(Continued from page 4.)

cent of the total travel. The road is 15.5 miles in length and lies in Los Angeles and Orange counties.

HIGHWAYS AFFORDING RELIEF TO HEAVY TRAFFIC ON PRESENT STATE ROADS

1. *A highway from Lancaster to a connection with the San Bernardino-Nevada state line highway (Route 31) near Cajon.* This route will make possible a short cut from San Bernardino to the San Joaquin Valley or to the East Sierra highways that extend through Owens Valley and up into Tahoe and Nevada. This cut-off offers advantages in avoidance of congested areas which will develop a volume of traffic more than that necessary to justify construction and maintenance costs. The road is 49 miles long and is situated in Los Angeles and San Bernardino counties.

2. *Castaic Junction to a connection with the Coast Highway near Ventura.* This road qualifies for inclusion in the state system both by reason of the relief it affords alternative state highways and the volume of state traffic now using it. It is at present a well traveled county highway following the Santa Clara River drainage. Its length is 39.5 miles and it lies in Los Angeles and Ventura counties.

3. *A highway from the southern terminus of the San Bernardino County to Bear Lake highway (Route 43) to Newport Beach via the Santa Ana Canyon.* This route forms a logical unit of the state system without likelihood of being supplanted by parallel service of equal value. It also qualifies because of the large volume of state travel that it now carries. It connects state highways serving San Bernardino, Redlands and Riverside and the coast. By this route, traffic avoids the inconvenience and congestion of the longer and busier highways. Its length is 63 miles. It lies in San Bernardino, Riverside and Orange counties.

4. *An extension of the Arroyo Seco state highway (Route 61) from Red Box to a connection with the Azusa to Pine Flats highway (Route 62) near Big Pine Flat.* This road qualifies because of the relief that it will afford for congested state highways of a recreational character and as a necessary addition to make fully available the expenditures on the important Arroyo Seco recreational highway. It lies in Los Angeles County and is 37 miles in length.

5. *Mojave to Bakersfield via Tehachapi Pass.* This road forms an important through route between the San Joaquin Valley and a wide area south and east of the Tehachapi Mountains. It connects the Valley Route (Route 4) with the state highway running north and south between the San Fernando Valley and Owens Valley (Route 23). At Mojave it connects with the state highway which leads east to interstate connections via the Arrowhead Trail and the National Old Trail routes, and is the most direct route to central and northern California for eastern travel over these latter routes. It forms a passage over the Tehachapi range, supplementing and relieving the Ridge Route. It is 60 miles in length and lies in Kern County.

6. *A highway from Santa Barbara to a connection with the Coast Highway near Zaca via San Marcos Pass.* This is an alternative to the Coast Highway north of Santa Barbara, shortening the distance by 10 miles. It is recommended for inclusion in the state system as a first unit of a parallel route to the present coast road to be eventually extended. Its attractive scenic features and shorter distance will attract a large amount of traffic. It is 38 miles in length and lies in Santa Barbara County.

GOVERNOR YOUNG'S STATEMENT

Commenting upon the report, Governor Young had the following to say:

"I feel that this report formulates a policy and establishes a precedent that will govern future additions to the state highway system upon their ability to qualify as of state importance. Previously expert study has followed the addition of roads to the state system. Now we are studying the roads before they are made state highways.

"This is the third major construction that the present administration and the legislature have made to the state highway system. The other two are first, financing new highway construction by the one-cent gasoline tax, and second, the application of the budget to state highway expenditures. The budget gives notice to the public in advance of the expenditure of highway funds, just where and how it is proposed to make expenditures. It is this program coupled with funds from the gasoline tax that has made it possible for the state highway authorities to increase highway work in the splendid manner that they have during a period of unemployment.

"The establishment of a policy assuring orderly and proper extensions to the state highway system solves the last of the major problems connected with our state roads. It means that California can continue the wonderful stride at which its state highway system is now being completed, that the expansion of the system will be along proper lines and that this state should continue to enjoy the reputation for fine highways that has contributed so much both to its growth and the enjoyment of its people."

MASSACHUSETTS—To insure uniformity in the design, location and operation of traffic signals, the Department of Public Works has recently taken over complete statewide control of these signals.

NATIONAL—Announcement, early in May that the Red Cross will establish and maintain first-aid stations along the highways, is a step forward in mitigating the disastrous results of our huge annual automobile accident toll.

NEBRASKA—Interstate traffic on Nebraska's through highways has increased more than 63 per cent since 1926 when the daily average noted at eleven stations was 226.5 vehicles.

NEW YORK—Methods first employed by John A. Roebling in 1854 are being used today in spinning the aerial cables of the 3000-foot suspension bridge being constructed across the Hudson River at Poughkeepsie.

PENNSYLVANIA—Exterior decoration on the new state highway building at Harrisburg recognizes the roles played by men and machinery in modern road building. The archives show road machinery—tractors and rollers—and a survey party.

WYOMING—At the end of the present construction season Wyoming highways will have 311 miles of oiled surface. Two million gallons of oil, to be purchased from local refineries, will be used this year.

First Mr. Blank—How did you find the roads on your recent automobile trip?

Second Mr. Blank—Well, the roads they named after that President, Mr. Lincoln, they were fine, but the roads they named after the Frenchman, Mr. Detour, they were terrible.

THE GOLDEN STATE HIGHWAY

(Continued from page 12.)

At the point where the Golden State Highway crosses the San Joaquin River north of Herndon an improvement was completed last year which eliminated two main line crossings of the Southern Pacific Railroad and considerable poor alignment. This was accomplished by rerouting west of the Southern Pacific, between Herndon and Tharsa, and constructing a new modern bridge over the San Joaquin River. The cost of this improvement was slightly less than \$300,000. Besides eliminating the dangerous grade crossings, the alignment was greatly improved and the distance shortened approximately 900 feet in a total distance of less than 2 miles.

South of Fresno an improvement is planned including resurfacing and widening pavement to a width of 30 feet from Fancher Creek to Fowler, and resurfacing and widening to 30 feet from Fowler to Fowler Switch canal, a total length of 7½ miles. Bids for this work were opened on May 25th.

WORK IN TULARE AND KERN COUNTIES

In Tulare County from Kingsburg to Goshen, the existing pavement is the old 15-foot by 4-inch concrete base. It is expected that the Golden State Highway through this locality will be improved to 20-foot pavement in the next biennium. With the exception of 8 miles from Tulare to Tipton, the remainder of the Golden State Highway in Tulare County is now improved to a high standard 20-foot pavement. The old sharp curvature around railroad reservations and entering and leaving cities, has been eliminated on these new improvements by use of large radius curves. Improvements in this locality during 1929 and 1930 have required an expenditure of approximately \$540,000.

In Kern County the Golden State Highway is now improved to a 20-foot pavement with the exception of approximately 5 miles north of Bakersfield. South of Bakersfield, approaching the Tehachapi Mountains, is a 17-mile length of highway which is entirely without curvature. The contiguous land is barren and dry, but the highway is bordered on both sides by a row of trees which were planted many years ago and have been given constant attention to promote their growth. At the end of the 17-mile tangent at a point known as the Grapevine Station, the road begins the ascent of the Grapevine Grade, reaching a summit about 3 miles south of Lebec in Los Angeles County.

IMPROVING THE GRAPEVINE GRADE

Plans for improvement of the Grapevine Grade contemplate a standard of alignment and grade which will be equivalent to that being used for relocation of the old Ridge route. Much of the existing curvature will be eliminated by relocation and the 10-mile distance reduced about 1 mile.

Plans for improvement contemplate the widening of all existing 15-foot pavement to a new 20-foot width and high standard alignment during the next biennium, which will close July 1, 1933.

FROM LEBEC TO LOS ANGELES

Through Los Angeles County the Golden State Highway is also known as the "Ridge road" due to the fact that it follows in great part between Lebec and a point north of Saugus the higher ridges.

Prior to the beginning of state highway work under the California Highway Commission in 1912, all travel to Los Angeles from the great San Joaquin Valley had to go by way of the Tehachapi route or the

Fort Tejon-Antelope Valley route through Lancaster and Palmdale by way of the Mint Canyon road.

One of the first studies of the Commission was to determine upon the location of a shorter, more direct route into Los Angeles to take care of the even then rapidly increasing volume of traffic from the San Joaquin Valley. Preliminary surveys showed a feasible route from Fort Tejon over what is now known as the Ridge route (Golden State Highway), being about 50 miles shorter between Los Angeles and Bakersfield than the existing Mint Canyon route.

The Pacific Light and Power Company and the General Petroleum Company were then constructing their high power transmission lines and pipe lines in the general location selected for the new Ridge route, and had built narrow construction roads with very sharp curves and steep grades to enable them to deliver supplies, materials and equipment for their construction work. These roads, although entirely unsuitable and unsafe for public use, were of great assistance to the state in establishing survey party camps, and to the state highway contractors in getting in supplies and equipment for the construction of the new highway.

ROAD COMPLETED IN 1919

Grading on this road was begun in 1913 and the original paving finally completed in 1919. The Ridge road, from the bottom of the hill at Castaic post office to the Neenach road north of Sandbergs, 29.56 miles in length, had 671 curves with a total curvature of approximately 35,000 degrees. Of these curves, 261 were of 100-foot radius or less. None of the grades on this Ridge road exceeded 6 per cent, but there were nearly 4 miles of the maximum 6 per cent grade. With the great increase in traffic, including a considerable percentage of slow moving trucks and trailers hauling very heavy loads, the road as originally constructed became inadequate to handle the travel, and the hazard to travel was greatly increased by automobiles trying to pass these slow moving loads on the narrow roadway with so many sharp curves with so small a clear sight distance.

The Highway Commission appropriated funds for the improvement of this road, to reduce this hazard and to facilitate travel by grading on the inside of blind curves and widening the roadbed at dangerous locations. This work has been carried on continuously since it first started at a cost of over \$400,000, and has resulted in greatly facilitating the safer movement of travel. Except for this work, the conditions on this road, the main highway connection between southern and central California, would have become intolerable long ago.

HUGE DAILY TRAVEL

However, the topographical conditions are such that it is impracticable to ever bring the existing Golden State Highway up to the modern standards required for the main highway connection between two rapidly developing empires such as we have in southern California and central and northern California.

Present traffic over the Ridge road, as shown by recent traffic counts, amounts to approximately 3400 vehicles per day on Sundays and 2400 on week days, with a steady growth of traffic from year to year.

THE "ALTERNATE" ROUTE

For the past few years studies and preliminary surveys have been made to find the most direct and practicable route across these mountains, and a location has been made between Castaic school and Gormans, which will be 7.3 miles shorter, and will elim-

inate 1280 feet of adverse grade. It eliminates three summits on the present ridge which cause trouble in heavy snow storms, and has only about 7500 degrees of curvature, or approximately one-fifth of that on the original Ridge road. No curve on the new road will have a radius less than 1000 feet, whereas there were many on the original road with a radius of only 70 feet.

The road will be an expensive one to build, but on account of its great shortening of the distance and with the heavy travel steadily increasing, will more than pay for itself in a short time.

FIRST CONTRACT LET

A contract has recently been awarded for the construction of the first 7 miles of this new route of the Golden State Highway northerly from Castaic school. This is the largest grading contract yet awarded in this district, and probably one of the largest in the state. The estimated grading quantities on this contract are 1,230,000 cubic yards of roadway excavation and 8,530,000 station yards of overhaul. The allotment for this one contract alone is over \$603,000. This first section is being graded 40 feet wide.

The grading on the next section, 5.2 miles long, will be started as soon as funds are available; probably at the beginning of the next biennium.

The present Ridge road from Castaic school to Gormans will be taken over by Los Angeles County and maintained as a county road immediately upon the completion and opening to travel of the new relocated Ridge road.

Minor line changes are proposed between Castaic Junction and one mile northerly, including a relocation across Castaic Creek, which will require the construction of a new bridge. The cost of this improvement is estimated at approximately \$100,000. There will be no great shortening in distance, but considerable improvement in alignment.

NEWHALL TUNNEL ELIMINATION

Another improvement in the old road that is nearly completed is the relocation of the highway between Los Angeles city limits and the Santa Clara River. This realignment eliminates the Newhall Tunnel, which for years has been the "bottleneck" on this portion of the road. This tunnel was built by Los Angeles County about 20 years ago in the early days of the county highway work, and eliminated the old narrow Fremont Pass road with its 28 per cent grade. There is no tunnel on this new road, the saddle being crossed by an open cut nearly 130 feet deep on the center line of the road and about 185 feet deep on the high side.

The new alignment saves approximately one mile in distance, and is on a high type of alignment and grade, thus making a considerable saving in the running time for travel between Los Angeles and Bakersfield, and also between Los Angeles and the easterly end of the Santa Clara Valley. This improvement 8½ miles long has been graded 46 feet wide, and a 30-foot Portland cement concrete pavement will be opened to travel about the middle of July. The cost of this improvement will be nearly \$750,000.

The old Newhall Tunnel road through Newhall and Saugus will still be maintained by the state as a part of the Mint Canyon road, and within the next two or three years the construction of a second tunnel paralleling the existing tunnel is planned so as to adequately take care of the heavy travel on this road.

SANTA CLARA RIVER BRIDGE

The old bridge on the Ridge road over the Santa Clara River, which was built by Los Angeles County

**CALIFORNIA SPEEDS
ROAD PROGRAM FAR
BEYOND U. S. AVERAGE**

Highway construction throughout the country has been speeded up fully 100 per cent in 1930 as compared with the first three months of 1929, according to the Automobile Club of Southern California, which bases the statement on reports from the governors of 35 states, sent to Secretary of Commerce Lamont. Contracts awarded for the first three months of 1930 amounted to \$114,101,383 as compared with \$50,910,133 for the same period of 1929, a net increase of more than 124 per cent. California increased 181 per cent.

BRAKE TESTING ACTIVITIES

(Continued from page 13.)

before the state patrol officers at the place designated in the citation, together with his car, for a second test. If the second test shows his brakes to be efficient he may thus clear his record.

Motorists are required to comply with section 94 of the Motor Vehicle Act setting up definite standards for brakes. The tests are made with a decelerometer.

It is not the intention of the patrol to be harsh or arbitrary in the matter of brakes. Rather, we hope by persistent enforcement to educate the motorist to the necessity of having his brakes inspected regularly and frequently.

Section 94 of the Motor Vehicle Act makes it unlawful to operate a motor vehicle unless it can be brought to a stop when traveling at given speed in a given distance. The table of speeds and distances set up in the act is as follows:

Miles per hour	Stopping distance
10	9.3
15	20.8
20	37
25	58
30	83.3

W. E. Glendinning has resigned his position as director of tree planting for the State Highway Commission and has purchased a mercantile business in Fresno. His resignation became effective July 1.

in 1916, was washed out at the time of the flood resulting from the failure of the San Francisquito Dam. A new modern bridge over the Santa Clara River and an overhead crossing over the Montalvo branch of the Southern Pacific Railroad were constructed on the alignment of the Newhall cut-off last year.

LIST OF HIGHWAY BIDS AND AWARDS

For Month of June

AMADOR, EL DORADO COUNTIES—Timber bridge across Cosumnes River about 10 miles south of El Dorado. Consist 1-120' through tr. sp. on concrete piers and 9-19' approach spans on fr. bents with concrete pedestals and approximately 14 miles roadway to grade and surface with untreated crushed gravel or stone. Dist. X, Rt. 65, Sec. A, C. M. B. McGowan, San Francisco, \$32,191. Contract awarded to C. E. Force, Piedmont, \$21,795.

BUTTE COUNTY—Between Bardees Creek and Pulga, about 1.8 miles long to be graded. Dist. II, Route 21, Sec. C. The Utah Construction Co., San Francisco, \$293,280. R. H. Travers, Los Angeles, \$372,446.; J. G. Donovan & Son, Los Angeles, \$401,622; H. H. Boomer, San Francisco, \$396,802; E. C. Coats, Sacramento, \$359,367; J. F. Shea Co., San Francisco, \$344,087. Contract awarded to Granfield, Farrar and Carlin, San Francisco, \$248,528.

DEL NORTE COUNTY—In Del Norte County in vicinity of the head of Richardson Creek about 0.5 mile to be graded. Dist. I, Route 1, Sec. A. J. E. Johnston, Stockton, \$15,269; Hemstreet & Bell, Marysville, \$13,559; Smith Bros., Eureka, \$13,712. Contract awarded to Englehart Paving and Construction Co., Eureka, \$11,417.

FRESNO AND KINGS COUNTIES—Between Coalinga and Hanford about 45 miles in length, light fuel oil to be applied to shoulders. Dist. VI, Route 10, Secs. D, E, F, B, C. G. M. Duntley, Los Angeles, \$15,834. Gilmore Oil Co., Ltd., Los Angeles, \$18,322; California Road Oil Service Co., Wilmington, \$19,227. Contract awarded to Stewart & Nuss, Inc., Fresno, \$14,363.

IMPERIAL COUNTY—Between Holtville and Sand Hills, about 1.5 miles to have furnished and spreading fuel oil on shoulders. Dist. VIII, Rt. 27, Sec. A. Contract awarded to G. M. Duntley of Los Angeles, \$1,685.72.

KERN COUNTY—Between Grapevine and Delano, and between 7.7 miles and 2.7 miles west of Maricopa, about 69.1 miles of oiling. Dist. VI, Rts. 4 and 57. Fred W. Nighbert, Bakersfield, \$10,195; Gilmore Oil Co., Los Angeles, \$9,821; California Road Oil Service Co., Wilmington, \$10,479. Contract awarded to G. M. Duntley, Los Angeles, \$8,235.

LOS ANGELES COUNTY—Between Citrus Ave. and Glendora 1 mile to be paved with asphaltic concrete. Dist. VII, Rt. 9, Sec. H. P. J. P. J. Akmadzich, Los Angeles, \$50,115. Contract awarded to Griffith Company of Los Angeles, \$36,319.50.

LASSEN AND MODOC COUNTIES—Between Hillside and Alturas, about 57.2 miles long, furnishing and applying heavy fuel oil. Dist. II, Rt. 28, Sec. A, B. Contract awarded to D. McDonald, Sacramento, \$21,509.45.

MARIN COUNTY—Between San Rafael and Alto, 4.4 miles to be surfaced with bituminous macadam. Dist. IV, Rt. 1, Sec. C, M. J. Bevanda, Stockton, \$104,180; Fredrickson & Watson, Oakland, \$108,780; A. Teichert & Son, Sacramento, \$117,121; C. W. Wood, Stockton, \$98,607; Heavey-Moore Co., Oakland, \$11,570; Arrs-Knapp Co., Oakland, \$114,825. Contract awarded to Granfield, Farrar and Carlin, San Francisco, \$94,892.50.

MONTEREY COUNTY—Bridge across Salinas River at Bradley, consisting of six 140-ft. steel deck truss spans, concrete deck on concrete piers with pile foundations; and eighteen 45-ft. reinforced concrete girder spans on concrete bents with pile foundations. Dist. V, Rt. 2, Sec. I. Rocca & Calletti, San Rafael, \$257,380; R. H. Travers, Los Angeles, \$262,915; Ward Engineering Co., San Francisco, \$268,897; J. F. Knapp, Oakland, \$269,216; Geo. Pollock Co., Sacramento, \$265,328; Siems-Helmers, Inc., San Francisco, \$308,146; Jasper-Stacy Co., San Francisco, \$336,178; Healy-Tibbitts Const. Co., San Francisco, \$314,267; M. B. McGowan, San Francisco, \$267,967. Contract awarded to H. E. Doering, Yreka, \$256,563.

NEVADA COUNTY—Overhead crossing over the S. P. tracks near Yuba Pass on the Victory Highway. Dist. III, Rt. 37, Sec. A. Lindgren & Swinerton, Inc., Sacramento, \$59,458; Ward Engineering Co., San Francisco, \$59,308; M. G. McGowan, San Francisco, \$60,593; T. E. Connolly, San Francisco, \$65,564. Contract awarded to Bodenhamer Construction Co., San Diego, \$55,751.75.

NEVADA COUNTY—Reinforced concrete bridge across the South Fork of the Yuba River near Indian Springs on the Victory Highway. Dist. III, Rt. 37, Sec. A. Ward Engineering Co., San Francisco, \$17,355; M. B. McGowan, San Francisco, \$16,740; T. E. Connolly, San Francisco, \$18,110. Contract awarded to Alturas Construction Co., Sacramento, \$13,935.

PLACER COUNTY—Subway crossing under the S. P. R. R. tracks near Emigrant Gap, Victory Highway. Dist. III, Rt. 37, Sec. E. Ward Engineering Co., San Francisco, \$58,891; T. E. Connolly, San Francisco, \$61,764. Contract awarded to Lord & Bishop, Sacramento, \$57,816.

NEVADA-PLACER COUNTY—Between South Fork of the Yuba River and Soda Springs, about 10.8 miles to be surfaced with crusher run base and untreated crushed gravel or stone. Dist. III, Rt. 37, Sec. A, F, B. Hein Bros. and Basalt Rock Co., Petaluma, \$238,715; A. Teichert & Son, Sacramento, \$211,633; Isbell Const. Co., Fresno, \$245,786; Geo. Pollock Co., Sacramento, \$227,558; Charles Harlowe, Jr., Oakland, \$164,398; J. P. Holland, Inc., San Francisco, \$220,524; Englehart Paving Co., Eureka, \$205,246. Contract awarded to Hemstreet & Bell, Marysville, \$157,089.

RIVERSIDE COUNTY—Between Whitewater River Bridge and Indio about 29 miles long, furnishing and applying heavy fuel oil to shoulders. Dist. VIII, Rt. 26, Secs. D, E. Gilmore Oil Co., Los Angeles, \$45,934; G. M. Duntley, Los Angeles \$43,261. Contract awarded to California Road Oil Service Co., Wilmington, \$42,167.44.

SAN BERNARDINO COUNTY—Between Cronese and E. boundary, 71.8 miles furnishing and applying heavy fuel oil. Dist. VIII, Rt. 31, Secs. J, K, L, M, N, P. California Road Oil Service Co., Wilmington, \$24,501; G. M. Duntley, Los Angeles, \$22,979. Awarded to Gilmore Oil Co., Ltd., Los Angeles, \$18,484.95.

SAN JOAQUIN COUNTY—Between South Banta Road and East Banta Road, 1.9 miles to be graded and paved with asphalt concrete. Dist. X, Rt. 5, Sec. B. C. W. Wood, Stockton, \$58,484; J. E. Johnson, Stockton, \$57,638; Valley Paving and Const., Visalia, \$56,508. Contract awarded to Heavey-Moore Co., Oakland, \$51,144.30.

SAN JOAQUIN COUNTY—Between French Camp and Stockton, 1.8 miles grading and surfacing with crushed gravel or stone, untreated. Dist. X, Rt. 4, Sec. B. Fredrickson & Watson Const. Co., Oakland,

\$50,248; Gannon and McCarty, Stockton, \$53,629; George Pollock Co., Sacramento, \$43,201; C. W. Wood, Stockton, \$46,183; D. McDonald, Sacramento, \$54,086; Kennedy-Bayles Const. Co., Biggs, \$64,030; A. Teichert & Son, Sacramento, \$55,881; Pereira & Reed, Tracy, \$47,144; Lilly, Willard & Biasotti, Stockton, \$43,055; R. G. Le Tourneau, Stockton, \$49,465. Contract awarded to Larsen Bros., Galt, \$42,828.90.

SAN JOAQUIN COUNTY—Between Houston School and Forest Lake, 3.3 miles to be graded and widened with Portland cement concrete and crusher run base. Dist. X, Rt. 4, Sec. D. C. W. Wood, Stockton, \$38,960; T. M. Morgan Paving Co., Los Angeles, \$43,487; Heafey-Moore Co., Oakland, \$49,592. Contract awarded to Larsen Bros., Galt, \$38,726.65.

SAN LUIS OBISPO COUNTY—Between Estrella River and Sacramento Ranch, about 5.9 miles to have seal coat applied to existing bituminous surfacing. Dist. V, Rt. 33, Sec. B. A. Teichert & Son, Sacramento, \$5,780; M. J. Bevanda, San Luis Obispo, \$6,998. Contract awarded to Granite Construction Co., Watsonville, \$5,744.

SANTA CLARA COUNTY—Between San Antonio Ave. and Sunnyvale, 4.9 miles to be graded and paved with Portland cement concrete and asphalt concrete. Dist. IV, Rt. 2, Sec. A. N. M. Ball, Porterville, \$210,045; A. J. Raisch, San Jose, \$209,771; Union Paving Co., San Francisco, \$208,986; Central California Roads Co., Oakland, \$233,386. Contract awarded to Hanrahan Co., San Francisco, \$204,904.10.

SANTA CRUZ COUNTY—Between Waterman Switchback and Saratoga Gap, 2.6 miles to be graded and surfaced with bituminous treated waterbound macadam. Dist. IV, Rt. 42, Sec. A. M. J. Bevanda, Stockton, \$156,052; W. A. Dantonville, Salinas, \$178,033; Granfield, Farrar & Carlin, San Francisco, \$157,201; J. P. Holland, Inc., San Francisco, \$139,641; C. R. Johnson, San Francisco, \$166,729; R. H. Travers, Los Angeles, \$144,043; Geo. Pollock Co., Sacramento, \$167,964; Kennedy-Bayles Const. Co., \$179,893; Arris-Knapp Co., Oakland, \$153,484. E. C. Coats, Sacramento, \$130,258. Contract awarded to O. A. Lindberg, Stockton, \$127,229.10.

SHASTA COUNTY—Bridge across Salt Creek, consisting of one 60' pony truss span on concrete piers and six 19' approach spans on frame bents with concrete pedestals. Dist. II, Rt. 28, Sec. A. Alturas Const. Co., Sacramento, \$14,111; C. Emil Force, Piedmont, \$14,921; H. C. Whitty, Sanger, \$15,244; Smith Bros. Co., Eureka, \$14,539; J. P. Brennan, Redding, \$13,439; Contract awarded to R. B. McKenzie, Red Bluff, \$12,544.70.

SHASTA AND LASSEN COUNTIES—Between Fall River Mills and Big Valley, about 17.9 miles in length to be graded and surfaced with untreated crushed gravel or stone. Dist. II, Rt. 28, Sec. E, A. Granfield, Farrar & Carlin, San Francisco, \$351,531. Isbell Construction Co., Fresno, \$339,938; Jasper & Stacy Co., San Francisco, \$324,039. Contract awarded to Mathews Construction Co., Sacramento, \$278,250.80.

SHASTA AND TRINITY COUNTIES—Between Tower House and Greenhorn, 5.2 miles; between Ashers and Montgomery Creek, 12.3 miles; between Haynes Ranch and Fall River, 24.1 miles; between Grass Valley Creek and Weaverville about 17.1 miles—furnishing and applying heavy fuel oil to roadbed. Dist. II, Rts. 20 and 28, Secs. A, B, D and A, B, J. A. Casson, Hayward, \$20,080; D. McDonald, Sacramento, \$20,582. Contract awarded to Basalt Rock Co., Inc., Napa, \$19,126.20.

SISKIYOU COUNTY—Between Shasta River and Walker a distance of about 21 miles, heavy fuel oil to be furnished and applied as dust layer. Dist. II, Rt. 46, Sec. D. Contract awarded to Basalt Rock Co., Napa, \$6,547.20.

SONOMA COUNTY—Between Beltane and Shellville, 3.9 miles furnishing and applying asphaltic road oil. Dist. IV, Rt. 51, Sec. B. Geo. French, Jr., Stockton, \$2,420; Basalt Rock Co., Inc., Napa, \$2,550. Awarded to A. Teichert & Son, Sacramento, \$2,280.

SONOMA AND MENDOCINO COUNTIES—Between Cloverdale and Hopland, 12.5 miles to be furnished and applied with asphaltic road oil. Dist. IV, Rt. 1, Sec. A. Basalt Rock Co., Napa, \$7,350; Highway Builder, Ltd., San Anselmo, \$7,650. Contract awarded to A. Teichert & Son, Sacramento, \$6,975.

TEHAMA, PLUMAS AND LASSEN COUNTIES—Between Dales and Coppervale, 51.1 miles heavy fuel oil to be furnished and applied as dust layer. Dist. II, Rt. 29, Secs. A, B, C and A. Basalt Rock Co., Inc., Napa, \$14,250; D. McDonald, Sacramento, \$15,983. Contract awarded to A. Teichert & Son, Inc., Sacramento, Cal., \$13,727.50.

TEHAMA AND SHASTA COUNTIES—Between 1 mile south of Cottonwood and Cottonwood, an under-grade crossing and 0.9 of a mile roadway graded and paved with Portland cement concrete. Dist. II, Rt. 3, Sec. C, A. Fredrickson & Watson Const. Co., Oakland, \$149,565; Ward Engineering Co., San Francisco, \$136,006; Dunn & Baker, Klamath Falls, \$150,134; Jasper-Stacy Co., San Francisco, \$152,783; Rocca and Caletti, San Rafael, \$139,050; Lindgren & Swinerton, Sacramento, \$200,943. Contract awarded to C. W. Wood, Stockton, \$135,058.

TULARE, MADERA, FRESNO AND KINGS COUNTIES—Various portions amounting to 102.6 miles light fuel oil to be furnished and applied to shoulders. Dist. VI, Rts. 4 and 10. Visalia Transfer & Storage Co., Visalia, \$12,012; Gilmore Oil Co., Los Angeles, \$13,446; California Road Oil Service Co., Wilmington, \$13,695. Contract awarded to G. M. Duntley, Los Angeles, \$11,620.

WATER APPLICATIONS AND PERMITS

Applications for permit to appropriate water filed with the State Department of Public Works Division of Water Resources during the month of June, 1930.

TRINITY COUNTY—Application 6690. C. M. Salyer, c/o C. A. Paulsen, Weaverville, Cal., for 25 c.f.s. from Hawkins Creek tributary to Trinity River to be diverted in Sec. 15, T. 6 N., R. 6 E., H. M., for mining and domestic purposes. Estimated cost \$5,000.

PLUMAS COUNTY—Application 6691. J. W. McKay and Merritt J. Reid, Meadow Valley, Cal., for 13,000 gallons per day from Deadwood Creek tributary to Spanish Creek to be diverted in Sec. 29, T. 24 N., R. 8 E., M. D. M., for mining and domestic purposes. Estimated cost \$200.

MONO COUNTY—Application 6692. Henry Heyman, 222 West 25th St., Long Beach, Cal., for 200 gallons per day from Rock Creek tributary to Owens River to be diverted in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic purposes. Estimated cost \$300.

MODOC COUNTY—Application 6693. Robert O. Fink, Cedarville, Cal., for 0.62 c.f.s., from Thomas Creek tributary to North Fork Pit River to be diverted in Sec. 28, T. 43 N., R. 15 E., M. D. M., for irrigation

and domestic purposes on 50 acres. Estimated cost \$50.

HUMBOLDT COUNTY—Application 6694 Chas. E. Snider & Walter Wilson, c/o Chas. E. Snider, 812 Mills Bldg., San Francisco, Cal., for 300 c.f.s., from Slate Creek tributary to Klamath River to be diverted in Sec. 7, T. 10 N., R. 5 E., H. M., for mining purposes.

SAN BERNARDINO COUNTY—Application 6695. Robert S. Irwin, Lucerne Valley, Cal., for 0.5 c.f.s., from 2 unnamed springs tributary to unnamed waterway, thence Mojave Desert to be diverted in Sec. 10, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic purposes on 40 acres. Estimated cost \$3,000.

COLUSA COUNTY—Application 6696. J. W. Browning, c/o Thos. Rutledge, Colusa, Cal., for 5.95 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 6, T. 14 N., R. 1 E., M. D. M., for irrigation purposes on 476.2 acres. Estimated cost \$6,690.

BUTTE COUNTY—Application 6697. H. N. Dalley, c/o Polk & Robinson, Chico, Cal., for 2.0 c.f.s., from Middle Butte Creek tributary to Sacramento River to be diverted in Sec. 34, T. 23 N., R. 3 E., M. D. M., for mining and domestic purposes. Estimated cost \$500.

SISKIYOU COUNTY—Application 6698. Fred J. Blakeley, c/o Butler, Van Dyke, Desmond and Harris, Attorneys, P. O. Box 1114, Sacramento, Cal., for 25 c.f.s., and 4000 acre-feet per annum from Elliott Creek tributary to Applegate River to be diverted in Sec. 24, T. 48 N., R. 10 W., M. D. M., for irrigation and domestic purposes.

BUTTE COUNTY—Application 6699. Harvey C. Adams, Chico, Cal., for 17.5 c.f.s. from Drainage Ditch from Drainage District No. 2 tributary to Butte Creek and Sacramento River to be diverted in Sec. 27, T. 19 N., R. 1 E., M. D. M., for irrigation purposes, 700 acres. Estimated cost \$1,500.

BUTTE COUNTY—Application 6700. Harvey C. Adams, Chico, Cal., for 3 c.f.s., from Drainage Ditch from Drainage District No. 2, tributary to Butte Creek and Sacramento River to be diverted in Sec. 28, T. 19 N., R. 1 E., M. D. M., for irrigation purposes on 120 acres.

NEVADA COUNTY—Application 6701. Nevada Irrigation District, c/o Fred H. Tibbetts, Chief Engineer, 1320 Alaska Commercial Bldg., San Francisco, Cal., for (1) 15 c.f.s. (2) 5 c.f.s., from (1) Fall Creek, (2) S. Fork Fall Creek tributary to South Fork Yuba River to be diverted in Sec. (1a) 36, T. 18 N., R. 11 E., M. D. M., Sec. (1b) 6, T. 17 N., R. 12 E., M. D. M., for power purposes. Estimated cost \$450,000.

NEVADA COUNTY—Application 6702. Nevada Irrigation District, c/o Fred H. Tibbetts, Chief Engineer, 1320 Alaska Commercial Bldg., San Francisco, Cal., for (1) 15 c.f.s., and (2) 5 c.f.s., from (1) Fall Creek, (2) S. Fork Fall Creek tributary to be diverted in Sec. (1a) 36, T. 18 N., R. 11 E., M. D. M., Sec. (1b) and (2) 6, T. 17 N., R. 12 E., M. D. M., for irrigation purposes on 167,789 acres. Estimated cost \$450,000.

SHASTA COUNTY—Application 6703. Lambert Dost, 3835 S. Vermont Ave., Los Angeles, Cal., for 0.25 c.f.s. from 2 unnamed springs and unnamed creek tributary to Churn Creek, thence Sacramento River to be diverted in Sec. 12, T. 32 N., R. 5 W., M. D. M., for domestic and irrigation purposes on 20 acres.

LAKE COUNTY—Application 6704. Martin Judge, Jr., & Co., Crocker First Nat'l Bank Bldg., San Francisco, Cal., for 250 c.f.s., and 175,000 acre-feet per annum from North Fork Cache Creek tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for industrial and domestic purposes. Estimated Cost \$3,000,000.

LAKE COUNTY—Application 6705. Martin Judge, Jr., & Co., Crocker First Nat'l Bank Bldg., San Francisco, Cal., for 175,000 acre-feet per annum from North Fork of Cache Creek tributary to Cache Creek to be diverted in Sec. 4, T. 14 N., R. 6 W., M. D. M., for irrigation on 50,000 acres. Estimated cost \$1,000,000.

SAN BERNARDINO COUNTY—Application 6706. George Tillitt, Highland, Cal., for 0.003 (or approx. 1950 gallons per day) from unnamed spring tributary to Green Valley Creek, thence Deep Creek, thence Mojave River to be diverted in Sec. 23, T. 2 N., R. 2 W., S. B. M., for domestic purposes. Estimated cost \$560.

ALAMEDA COUNTY—Application 6707. East Bay Municipal Utility District, c/o T. P. Wittschen, Atty., 1406 Latham Square Bldg., Oakland, Cal., for 42 c.f.s. and 41,436 acre-feet per annum from San Leandro, Kiser, Redwood, Moraya, Kings, Reilly's and Perez Creeks tributary to San Leandro Bay to be diverted in Sec. 6, T. 2 S., R. 2 W., M. D. M., for municipal purposes. Estimated cost \$1,377,000.

VENTURA COUNTY—Application 6708. W. S. Dunshee, Edward M. & John L. Selby, Ventura, Cal., for 100 acre-feet per annum from Cayote Creek tributary to Ventura River to be diverted in Sec. 15, T. 4 N., R. 24 W., S. B. M., for recreational and domestic purposes. Estimated cost \$50,710.

VENTURA COUNTY—Application 6709. Edward M. & John L. Selby, R. D. No. 1, Ventura, Cal., for 0.067 c.f.s. from Mountain Spring tributary to North Fork Cayote Creek, thence Cayote Creek, thence Ventura River to be diverted in Sec. 15, T. 4 N., R. 24 W., S. B. B. & M., for domestic purposes. Estimated cost \$2,000.

GLENN COUNTY—Application 6710. Eugene K. REYNOLDS, Elk Creek, Cal., for 0.06 c.f.s., from Stony Creek tributary to Sacramento River to be diverted in Sec. 27, T. 21 N., R. 6 W., M. D. M., for irrigation 6 A. purposes. Estimated cost \$250.

STANISLAUS AND MERCED COUNTIES—Application 6711. Turlock Irrigation District, c/o R. V. Merkle, Chief Engineer, 117 West Main St., Turlock, Cal., for 800 c.f.s. from Tuolumne River tributary to San Joaquin River to be diverted in Sec. 16, T. 3 S., R. 14 E., M. D. M., for irrigation purposes.

SAN JOAQUIN COUNTY—Application 6712. Frank Piccardo, Carlo Morzone, Angelo Calcagno and C. Farani, 109 E. Weber St., Stockton, Cal., c/o L. B. Raab, for 0.92 c.f.s. from San Joaquin River tributary to Suisun Bay to be diverted in Sec. 5, T. 1 S., R. 6 E., M. D. M., for irrigation and domestic purposes on 73.7 acres. Estimated cost \$3000.

INYO COUNTY—Application 6713. Ada Norris, P. O. Box 2, Trona, Cal., for 0.50 c.f.s., from Spring in Pleasant Canyon tributary to Panamint Valley Watershed to be diverted in Sec. 12, T. 22 S., R. 44 E., M. D. M., for mining and domestic purposes.

SAN BERNARDINO COUNTY—Application 6714. Mary Francis Bird, B Bar B Ranch, Victorville, Cal., for 0.25 c.f.s., from Ruby Springs, Ruby Canyon tributary to Mojave Desert to be diverted in Sec. 5, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic purposes on 15 acres. Estimated cost \$20.

SHASTA COUNTY—Application 6715. J. J. Vokal et al., c/o Mr. Roscoe J. Anderson, Suite 25, P. O. Building, Redding, Cal., for 7 c.f.s., from Olney Creek including foreign and natural flow tributary to Sacramento River to be diverted in Sec. 27 of Rancho Bueno Ventura, P. B. Reading Grant, for power purposes. Estimated cost \$250.

SHASTA COUNTY—Application 6716. J. J. Vokal et al., c/o Mr. Roscoe J. Anderson, Suite 25, P. O. Building, Redding, Cal., for 0.50 c.f.s. from Olney Creek including foreign and natural flow tributary to Sacramento River to be diverted in Sec. 27 of Rancho Bueno Ventura, P. B. Reading Grant, for irrigation and domestic purposes. Estimated cost \$250.

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources during the month of June, 1930.

SAN BERNARDINO COUNTY—Permit 3492, Application 6435. Issued to J. F. Gore, Beverly Hills, Cal., June 5, 1930, for 0.1 c.f.s. from unnamed spring in Sec. 26, T. 1 N., R. 3 W., S. B. M., for irrigation on 40 acres. Estimated cost \$750.

TRINITY COUNTY—Permit 3493, Application 6564. Issued to A. J. Norcott and W. H. Dadley, Burnt Ranch, Cal., June 5, 1930, for 0.48 c.f.s. from unnamed spring in Sec. 34, T. 6 N., R. 6 E., M. D. M., for mining, water to be returned to Trinity River. Estimated cost \$500.

INYO COUNTY—Permit 3494, Application 6599. Issued to J. F. Chrysler and F. H. Cook, Lone Pine, Cal., June 6, 1930, for 0.025 c.f.s. from Carrol Creek in Sec. 31, T. 16 S., R. 36 E., M. D. M., for irrigation and domestic use on 20 acres. Estimated cost \$300.

INYO COUNTY—Permit 3495, Application 5073. Issued to H. W. Eichbaum, Avalon, Cal., June 19, 1930, for 0.008 c.f.s. from Lower Spring in Emigrant Canyon in Sec. 29, T. 17 S., R. 44 E., M. D. M., for domestic use. Estimated cost \$150.

INYO COUNTY—Permit 3496, Application 5336. Issued to H. W. Eichbaum, Darwin, Cal., June 19, 1930, for 0.001 c.f.s. from unnamed seepage water in Sec. 30, T. 16 S., R. 45 E., M. D. M., for domestic use. Estimated cost \$3,000.

DEL NORTE COUNTY—Permit 3497, Application 6453. Issued to E. F. Raymond, Crescent City, Cal., June 21, 1930, for 5 c.f.s. from Patrick's Creek in Sec. 9, T. 17 N., R. 3 E., H. M., for power. Estimated cost \$1,500.

EL DORADO COUNTY—Permit 3498, Application 6556. Issued to Arthur E. Rasor, c/o A. J. Harder, Atty., 518 Ochsner Bldg., Sacramento, Cal., June 23, 1930, for 34.2 acre-feet per annum from Rock Creek in Sec. 34, Lot 1, T. 13 N., R. 11 E., M. D. M., for mining. Estimated cost \$2,000.

EL DORADO COUNTY—Permit 3499, Application 6557. Issued to Arthur E. Rasor, c/o A. J. Harder, Atty., 518 Ochsner Bldg., Sacramento, Cal., June 23, 1930, for 34.2 acre-feet per annum from Rock Creek in Sec. 34, Lot 1, T. 13 N., R. 11 E., M. D. M., for irrigation of 10 acres. Estimated cost \$2,000.

EL DORADO COUNTY—Permit 3500, Application 6558. Issued to Arthur E. Rasor, c/o A. J. Harder, Atty., 518 Ochsner Bldg., Sacramento, Cal., June 23, 1930, for 34.2 acre-feet per annum from Rock Creek in Sec. 34, Lot 1, T. 13 N., R. 11 E., M. D. M., for Recreational and Domestic. Estimated cost \$2,000.

INYO COUNTY—Permit 3501, Application 5286. Issued to J. Irving Crowell, R. F. D. No. 1, Box 60, Van Nuys, Cal., June 24, 1930, for 0.025 c.f.s. from Keane Springs in SE $\frac{1}{4}$ projected Sec. 6, T. 30 N., R. 1 E., for mining, milling and domestic. Estimated cost \$7,000.

SUTTER COUNTY—Permit 3502, Application 6664. Issued to James R. Sutter Cranmore, Sutter Co., Cal., June 24, 1930, for 1.94 c.f.s. from Sacramento River in NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 14, T. 13 N., R. 1 E., M. D. M., for irrigation 154.967 acres. Estimated cost \$5,000.

RIVERSIDE COUNTY—Permit 3503, Application 4752. Issued to Palm Valley Water Co., c/o C. L. McFarland, Atty., Suite 3, 4 & 5, Evans Block, Riverside, Cal., June 25, 1930, for 1.5 c.f.s. from Snow Creek, in NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 33, T. 3 S., R. 3 E., S. B. M., for domestic use. Estimated cost \$81,000.

SISKIYOU COUNTY—Permit 3504, Application 6436. Issued to Charles Wilton Fay, 4131 Lincoln Ave., Oakland, Cal., June 25, 1930, for 3.0 c.f.s. from Mill Creek in SE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 25, T. 18 N., R. 6 E., H. M., for mining and domestic use. Estimated cost \$75.

SONOMA COUNTY—Permit 3505, Application 6512. Issued to Joe M. Fernandez, Box 490, Sonoma, Cal., June 26, 1930, for 0.22 c.f.s. from Sonoma Creek in SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 13, T. 5 N., R. 6 W., M. D. M., for irrigation. Estimated cost \$825.

MONO COUNTY—Permit 3506, Application 6129. Issued to Thomas H. McKee, Bishop, Cal., June 26, 1930, for 3000 gallons per day from unnamed spring in SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 14, T. 2 S., R. 26 E., M. D. M., for domestic use. Estimated cost \$350.

TUOLUMNE COUNTY—Permit 3507, Application 6129. Issued to Sierra and S. F. Power Co., c/o P. M. Downing, 1st V. P. and G. M., P. G. & E. Co., 245 Market St., San Francisco, Cal., June 27, 1930, for 5360 acre-feet per annum from South Fork Stanislaus River in SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 24, T. 3 N., R. 16 E., M. D. M., for power (3382 T. H. P.). Estimated cost \$380,000.

TUOLUMNE COUNTY—Permit 3508, Application 6130. Issued to Sierra and S. F. Power Co., c/o P. M. Downing, 1st V. P. & G. M., P. G. & E. Co., 245 Market St., San Francisco, Cal., June 27, 1930, for 5360 acre-feet per annum from S. Fork of Stanislaus River in SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 24, T. 3 N., R. 16 E., M. D. M., for irrigation and domestic, 3500 acres. Estimated cost \$380,000.

PLACER COUNTY—Permit 3509, Application 6540. Issued to Mrs. Eva Harness and R. Longley, Loomis, Cal., June 28, 1930, for 0.26 c.f.s. from Secret Ravine in SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 10, T. 11 N., R. 7 E., M. D. M., for irrigation, 37 acres. Estimated cost \$850.

DAM APPLICATIONS, APPROVALS AND PLANS

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 June, 1930.

SAN MATEO AND SANTA CLARA COUNTIES—Lagunita Dam No. 614-3. Leland Stanford Jr. University, Stanford University, California, owner; earthfill, 3 $\frac{1}{2}$ feet high with a storage capacity of 260 acre-feet, situated on no stream tributary to San Francisco Bay in Sec. 10, T. 6 S., R. 3 W., M. D. M., for storage purposes for irrigation and recreation use.

YUBA COUNTY—St. Louis Dam No. 331. Loftus Blue Lead Mines Company, Los Angeles, California, owner; arch, 55 feet above streambed, situated on Slate Creek tributary to North Fork of Yuba River in Sec. 11, T. 20 N., R. 8 E., M. D. M., for storage purposes for debris use. Estimated cost \$45,000.

SIERRA COUNTY—Huntington Flat A & B Dams Nos. 331-2. Loftus Blue Lead Mines Co., Los Angeles, California, owner; earthfill, 15 feet in height with storage capacity of 60 acre-feet, situated on no stream in Sec. 7, T. 21 N., R. 10 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Mose Emery Dam No. 331-3. Loftus Blue Lead Mines Company, Los Angeles, California, owner; earthfill, 20 feet above streambed with a storage capacity of 8 acre-feet, situated on a gulch tributary to Cedar Grove Ravine in Sec. 12, T. 21 N., R. 9 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Gardner's Point Dam No. 331-4. Loftus Blue Lead Mines Company, Los Angeles, California, owner; earthfill, 7 feet height with a storage capacity of 60 acre-feet, situated on no stream in Sec. 13, T. 21 N., R. 9 E., M. D. M., for storage purposes for mining use.

SACRAMENTO COUNTY—Alder Creek Dam No. 453. Natomas Company, Sacramento, California, owner; earthfill, 12 feet above streambed with a storage capacity of 20 acre-feet, situated on Alder Creek, tributary to American River in Sec. 15, T. 9 N., R. 7 E., M. D. M., for storage purposes for irrigation use.

PLUMAS COUNTY—Eureka Lake Dam No. 283. Plumas Eureka Corporation, Johnsville, California, owner; earthfill, 20 feet above streambed with a storage capacity of 400 acre-feet, situated on no stream tributary to Jamison Creek in Sec. 23, T. 22 N., R. 11 E., M. D. M., for storage purposes for power and mining use.

SAN DIEGO COUNTY—Harrison Dam No. 844. R. E. Harrison, San Diego, California, owner; earthfill, 14 feet above streambed, situated on McCain Creek in Sec. 22, T. 17 S., R. 7 E., S. B. M., for storage purposes for recreation use. Estimated cost \$2,500.

RIVERSIDE COUNTY—Stansbury Dam No. 819. Corona Heights Water Company, Los Angeles, California, owner; earthfill, situated on a pipe line tributary to no stream, located in Lot 316, Corona Heights for storage purposes for domestic and irrigation use.

SIERRA COUNTY—Lower Spencer Lake Dam No. 298. William Hood, Berkeley, California, owner; earth and rock fill, 24 feet above streambed with a storage capacity of 300 acre-feet, situated on Lower Spencer Lake tributary to Yuba River for storage purposes for power use.

SIERRA COUNTY—Upper Spencer Lake Dam No. 298-2. William Hood, Berkeley, California, owner; rock and earth fill, 4 feet above streambed with a storage capacity of 25 acre-feet, situated on Upper Spencer Lake, tributary to Yuba River for storage purposes for power use.

SAN MATEO COUNTY—Burlingame Dam No. 611. Pacific Water Company, San Mateo, California, owner; earthfill, 50 feet above streambed with a storage capacity of 91 acre-feet, situated on a dry creek, tributary to San Francisco Bay, located in San Mateo Rancho for storage and diversion purposes. Estimated cost \$30,000.

SAN MATEO COUNTY—Cowell Dam No. 615—I. M., H. E. & S. H. Cowell, San Francisco, California, owners; earthfill, 30 feet above streambed, situated on Denison Creek tributary to Pacific Ocean, located on Rancho Canal de Tierra for storage purposes for irrigation use.

MONTEREY COUNTY—Black Rock Creek Dam No. 643. Monterey Game and Stock Association, Monterey, California, owner; earth and rock fill, 30 feet above streambed with a storage capacity of 30 acre-feet, situated on North Fork of Black Rock Creek tributary to Carmel River in Sec. 32, T. 17 S., R. 2 E., M. D. M., for storage purposes for recreation use. Estimated cost \$23,000.

ORANGE COUNTY—North Lambert Dam No. 793A. The Irvine Company, Tustin, California, owner; earthfill dam, 12 feet above streambed with a storage capacity of 200 acre-feet situated on no stream, located in Lot 368, Irvine's subdivision for storage purposes for irrigation use. Estimated cost \$4,400.

ORANGE COUNTY—South Lambert Dam No. 793B. The Irvine Company, Tustin, California, owner; earthfill, 11 $\frac{1}{2}$ feet above streambed with a storage capacity of 200 acre-feet, situated on no stream, located in Lot 368 of Irvine's subdivision for storage purposes for irrigation use. Estimated cost \$3400.

CALAVERAS COUNTY—Moosehead Dam No. 493—Franklin Baldwin, Los Angeles California, owner;

arch, 23 feet above streambed with a storage capacity of 120 acre-feet, situated on McKinney's Creek tributary to Calaveritas Creek in Sec. 14, T. 4 N., R. 13 E., M. D. M., for storage purposes, for debris use. Estimated cost \$8,500.

SIERRA COUNTY—Poverty Hill Dam No. 296. 1. M. Stiles, Shreveport, Louisiana, owner; earthfill, 17 feet high with a storage capacity of 200 acre-feet, situated on no stream in T. 20, R. 9 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Cleveland Reservoir Dam No. 296-2. W. P. Stiles, Shreveport, Louisiana, owner; earthfill, 13 feet above streambed with a storage capacity of 150 acre-feet, situated on Rock Creek tributary to Canyon Creek in T. 20 N., R. 9 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Fairplay, Upper Dam No. 296-3. W. P. Stiles, Shreveport, Louisiana, owner; earthfill, 20 feet above streambed with a storage capacity of 50 acre-feet, situated on no stream in T. 20 N., R. 9 E., M. D. M., for storage purposes for mining use.

SIERRA COUNTY—Fairplay, Lower Dam No. 296-4. W. P. Stiles, Shreveport, Louisiana, owner; earthfill, 18 feet above streambed with a storage capacity of 12 acre-feet, situated on no stream in T. 20 N., R. 9 E., M. D. M., for storage purposes for mining use.

NAPA COUNTY—Napa Upper No. 3 Dam No. 1-9. Napa State Hospital, Imola, California, owner; earthfill, 32 feet above streambed with a storage capacity of 10 acre-feet, situated on an unnamed canyon in T. 5 N., R. 4 W., M. D. M., for storage purposes for irrigation use.

SIERRA COUNTY—Gold Run Dam No. 297. Judson Estate Company, San Francisco, California, owner; earthfill, 20 feet above streambed with a storage capacity of 20 acre-feet, situated on Gold Run tributary to Slate Creek and Yuba River in Sec. 29, T. 20 N., R. 9 E., M. D. M., for storage purposes for mining use.

MENDOCINO COUNTY—Mendocino Lower Dam No. 1-2. Mendocino State Hospital, Talmage, California, owner; concrete, 16 feet above streambed situated on South Mill Creek, tributary to Russian River in Sec. 25, for storage purposes for domestic use.

LOS ANGELES COUNTY—Clear Creek Dam No. 32-17. Los Angeles County Flood Control District, Los Angeles, California, owner; arch, 20½ feet above streambed, situated on Clear Creek tributary to Big Tujunga Creek in Sec. 1, T. 2 N., R. 13 W., S. B. M., for storage purposes for domestic use.

LOS ANGELES COUNTY—Lower Big Dalton Dam No. 32-18. Los Angeles County Flood Control District, Los Angeles, California, owner; concrete, 52 feet above streambed with a storage capacity of 31.5 acre-feet situated on Big Dalton Creek tributary to Walnut Creek in Sec. 15, T. 1 N., R. 9 W., S. B. M., for storage purposes for flood control and debris use.

Applications for approval of plans and specifications for the construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources during the month of June, 1930.

SAN MATEO COUNTY—Bear Gulch Dam No. 613. Bear Gulch Water Company, Menlo Park, California, owner; clayfill, 56 feet above streambed with a storage capacity of 672 acre-feet situated in depression in hills west of Menlo Park in T. 6 S., R. 4 W., M. D. M., for storage purposes for domestic use. Estimated cost \$73,000. Fees paid \$730.

HUMBOLDT COUNTY—Benbow Dam No. 106. Benbow Power Company, Benbow, California, owner; Ambursen, 17.5 feet above streambed with a storage capacity of 78 acre-feet situated on South Fork of Eel River tributary to Eel River in Sec. 36, T. 4 S., R. 3 E., H. M., for storage purposes for power use. Estimated cost \$45,000. Fees paid \$450.

EL DORADO COUNTY—Webber Creek Dam No. 53-3. El Dorado Irrigation District, Placerville, California, owner; earthfill, 147 feet above streambed with a storage capacity of 6000 acre-feet, situated on Webber Creek tributary to American River in Sec. 18, T. 10 N., R. 12 E., M. D. M., for storage and diversion purposes for irrigation use. Estimated cost \$300,000. Fees paid \$2,000.

MODOC COUNTY—Long Branch Canyon Dam No. 159. J. Householder, Davis Creek, California, owner; earth and rock fill, 12 feet above streambed with a storage capacity of 400 acre-feet, situated on Long Branch Canyon tributary to Goose Lake in Sec. 26,

T. 47 N., R. 12 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$1000. Fees paid \$20.

Plans and specifications for the repair or alteration of dams filed by the State Department of Public Works, Division of Water Resources during the month of June, 1930.

NEVADA COUNTY—Fuller Lake Dam No. 97-21. Pacific Gas and Electric Company, San Francisco, California, owner; earthfill, situated on Jordan Creek tributary to South Fork of Yuba River in Sec. 17, T. 17 N., R. 12 E., M. D. M. Nature of repairs: New outlet; gunite slab on upstream face.

SAN MATEO COUNTY—Emerald Lake No. 1, Lower Dam No. 612. Emerald Lake Country Club, San Mateo, California, owner; earthfill, situated in a small valley tributary to Redwood Creek, located 2½ miles southwest of Redwood City. Nature of repairs: Earth fill on downstream face and install new spillway.

SAN MATEO COUNTY—Emerald Lake No. 3 Dam No. 612-2. Leonard & Holt, San Francisco, California, owner; earthfill, situated on no creek, located 2½ miles west of Redwood City. Nature of replace: Install water tight core.

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 June, 1930.

SAN MATEO COUNTY—Bear Gulch Dam No. 613. Bear Gulch Water Company, Menlo Park, California, owner; rolled clay, 56 feet above streambed with a storage capacity of 672 acre-feet, situated in a depression in hills west of Menlo Park, located in Rancho Alameda de Los Pulgas for storage purposes for domestic use. Estimated cost \$73,000.

EL DORADO COUNTY—Webber Creek Dam No. 53-3. El Dorado Irrigation District Placerville, California, owner; earthfill, 147 feet above streambed with a storage capacity of 6000 acre-feet, situated on Webber Creek tributary to American River in Sec. 18, T. 10 N., R. 12 E., M. D. M., for storage and diversion purposes for irrigation use. Estimated cost \$300,000.

AMADOR COUNTY—Allen Dam No. 1-12. Preston School of Industry, Waterman, California, owner; reinforced concrete, 21 feet above streambed with a storage capacity of 2½ acre-feet situated on Downes Ditch in Sec. 27, T. 6 N., R. 10 E., M. D. M., for storage purposes for domestic use. Estimated cost \$10,120.

Plans and specifications for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources during the month of June, 1930.

NEVADA COUNTY—Fuller Dam No. 97-21. Pacific Gas and Electric Company, San Francisco, California, owner; earthfill, situated on Jordan Creek tributary to South Fork of Yuba River in Sec. 17, T. 17 N., R. 12 E., M. D. M. New outlet pipe and gate; gunite upstream face.

SAN MATEO COUNTY—Emerald Lake No. 1 Dam No. 612. Emerald Lake Country Club, Redwood City, California, owner; earthfill, situated on a small valley tributary to Redwood Creek, located 2½ miles southwest of Redwood City. Nature of repairs: Make earth fill on downstream side; install 30-inch pipe for spillway.

SAN MATEO COUNTY—Emerald Lake No. 2 Dam No. 612-2. Leonard & Holt, San Francisco, California, owner; earthfill, located 2½ miles west of Redwood City.

MONTEREY COUNTY—Black Rock Dam No. 643. Monterey Game and Stock Association, Monterey, California, owner; earth and rock fill, situated on North Fork of Black Rock Creek tributary to San Clemente Creek in Sec. 32, T. 17 S., R. 2 E., M. D. M. Nature of repairs: Repair drain pipe.

TENNESSEE—Completion of State Highway No. 100 will provide a shorter route between Nashville and Memphis and will tap the largest area in the state lying five miles from an existing trunk highway.

HIGHWAY PATROL APPOINTMENTS

For Month of June

The following officers have been appointed members of the California Highway Patrol in the following counties:

HUMBOLDT COUNTY—Thaddeus J. Douarin; Albert A. Nickols; Harold R. Down.

MONTEREY COUNTY—A. W. Martin, Jr.; Whitmer R. McGregor; Chas. E. Garcia.

SHASTA COUNTY—Raymond Larison; Marion P. Howard.

BUTTE COUNTY—Wm. J. Bathurst, Jr.

SAN LUIS OBISPO COUNTY—Jesse L. Urey; Cecil C. Dempsey.

COLUSA COUNTY—Archie G. Matzka; Jean Schilling Thayer.

EL DORADO COUNTY—R. P. Cornelison, Thomas V. Eisenhuth.

SAN JOAQUIN COUNTY—Merrill K. Harper.

ARCHITECTURAL AWARDS

For Month of June

PRESTON SCHOOL OF INDUSTRY, Ione: Contract for installation of refrigerating system, Refectory Building, awarded to Parker Ice Machine Company of San Francisco, \$7,992.

BORDER STATION at Fort Yuma: Contract for construction of same for use of Department of Agriculture and Division of Motor Vehicles awarded to Holland Construction Company of San Diego, \$18,734.

FOLSOM STATE PRISON: Contract for installation of passenger elevator in new Hospital Building awarded to Spencer Elevator Company of San Francisco, \$3,095.

CALIFORNIA SCHOOL FOR DEAF, Berkeley: Contract for wrecking Strauss Hall awarded to Symon Brothers of Oakland, \$2,500.

VETERANS HOME, Yountville: Contract for construction Guard House awarded to Gaubert Brothers of Oakland, \$15,750.

STOCKTON STATE HOSPITAL: Contract for construction of Crematory Furnace awarded to JNJ Firebrick Construction Company of San Francisco for \$1,888.

Against total exports of 835,527 motor vehicles from the United States and Canada there were but 750 motor vehicles imported into the United States during 1929.

FOILED THE COPS

"Coming home the other night at three o'clock our headlights burned out on us."

"How did you get home without getting arrested?"

"We just drove at full speed and all the cops thought we were bootleggers."

SALVAGING WATER WASTE IN LOS ANGELES COASTAL BASIN

(Continued from page 16.)

16. Investigation of locations for best utilization of water imported by Metropolitan Water District.

17. Study of organization for financing and distributing benefits.

18. Study of legal phases.

It will be seen that the work which is being done or which may be done toward salvage resolves itself into two general phases.

In one, actual construction is the main feature and the result will be immediate salvage of waste. In the other, research for a term of years is necessary to arrive at the more elusive wastes and the best methods of utilizing all wastes and imported waters.

OTHER PHASES OF INVESTIGATION

The various other phases of the water study of California are continuing.

DAM APPROVALS AND PERMITS

To date 673 applications have been filed with the Department for approval of existing dams and dams under construction.

OTHER ACTIVITIES DURING MONTH

There were the usual activities during the month in connection with flood control and reclamation, bank protection, adjudication of water rights, compilation of data secured by snow surveys, irrigation district matters, etc.

IRRIGATION AND RECLAMATION FINANCING

A meeting of the California Irrigation and Reclamation Financing and Refinancing Commission was held in the offices of the Attorney General at Sacramento on July 18th at 10 a.m. The following members of the commission were in attendance: Will C. Wood, Superintendent of Banks, chairman; Edward Hyatt, State Engineer, secretary; Charles L. Childers, attorney, Imperial Irrigation District, El Centro; Fred W. Kiesel, president California National Bank, Sacramento; Charles E. MacLean, vice president Anglo and London-Paris National Bank, San Francisco; U. S. Webb, Attorney General.

This meeting was called particularly for the purpose of hearing from those actively interested in reclamation districts and to consider the financial problems of these districts, especially those in the Sacramento Valley. The next meeting of the commission will be held in Stockton on Thursday, August 28th, at 10 a.m.

The red light is the place where you catch up with the driver who passed you at fifty miles an hour eight or nine blocks down the line.—*Detroit News*.

STATE HIGHWAYS IN CALIFORNIA SHOWING THE PRIMARY AND SECONDARY ROAD SYSTEMS AND THE DIVISION OF THE STATE UNDER THE BREED BILL.



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