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The new Feather River Highway Gateway Bridge which will be dedicated this month at Oroville

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State Moves to Aid Unemployed

MOVING swiftly to assure maximum aid from the state to relieve unemployment conditions in California, B. B. Meek, director of the Department of Public Works, announced to the Governor's Council on October 28th that plans had been perfected by the California Highway Commission and Division of Highways whereby from 2000 to 3200 additional men will be given work during the winter months with maintenance crews and at labor camps to be established on the state highway system.

The California Highway Commission at its meeting on November 6th formally ratified the plans of the Division of Highways for the unemployment relief work, and set up a fund of \$1,000,000 to finance the work.

Following immediately upon Mr. Meek's announcement, the machinery of the Division of Highways was put into motion arranging for the enlargement of maintenance crews and selecting sites for the new camps and building housing accommodations for the men to be employed there.

BASIS OF CAMP SITE SELECTION

The sites for the new camps were determined by the following conditions:

First, adaptability for profitable use of a maximum of hand work and a minimum of machinery;

Second, adaptability for operation during the winter months;

Third, advantages that the locations offer for an even distribution of employment between the northern and southern sections of the state.

MAINTENANCE CREWS

Crews engaged in maintenance work in various parts of the state will be enlarged and approximately 1200 men employed in this manner in addition to those now engaged in maintenance operations.

The enlargement of the maintenance crews will enable relief to be afforded over a large section of California without necessity of providing housing accommodations for the men thus employed.

Commenting upon his first announcement, Director Meek further stated that the new employment will be confined strictly to bona fide residents of California, and that labor



B. B. MEEK

will be employed through the free employment agencies operated by the State Department of Industrial Relations.

A wage of \$3 per day with board and lodging will be paid to the men in camps and \$4 a day to the men in maintenance crews who provide their own upkeep.

In working out the details of the plans for the new labor camps, the Division of Highways is having the full cooperation of Director Will J. French of the Department of Industrial Relations and his corps of assistants.

The Division of Highways will operate the camps in which the men will be housed and fed.

CAMP SITES

The camp sites thus far selected are as follows:

Feather River Lateral—Camp site at Rich in Plumas County; A. N. Lund, superintendent.

Carmel-San Simeon Highway—Camp site at Anderson Canyon in Monterey County south of the Big Sur; W. B. Albertson, superintendent.

Valley Route, Sacramento to Los Angeles—Camp site on Ridge Route alternate in Los

Angeles County; R. L. Thomas, superintendent.

Arroyo Seco Highway—Camp site at Arroyo Seco in Los Angeles County; A. N. George, superintendent.

Each camp will accommodate 250 men.

FOLLOWS POLICY

The operation of these camps is in accordance with the established policy of the administration to expand public works to the maximum during the present period of depression and unemployment. This policy during the past three years has been reflected in the largest state highway building program in the history of California. The new labor camps now being established are a further expression of this policy, and are intended to reduce distress from unemployment during the winter months as far as it lies within the ability of the state so to do.

The added work is being financed from savings made on contracts and money accumulated through the progressive reduction of overhead costs on state highway construction.

Commenting on the employment of these men as a means of assisting the labor situation in the state, Mr. Meek had the following to say:

"It is indeed gratifying to the Department of Public Works that it finds itself in a position to render substantial aid to the unemployed of California during the coming winter months. The fact that the work to be provided for this purpose is financed from the savings on contracts and from the reduction in overhead costs evidences the thrifty manner with which the Division of Highways has conducted its affairs.

"There is one further phase of this matter that will be of particular interest.

"Without the budget system governing state highway expenditures which was put in force for the first time during the first year of Governor Young's administration, it would be impossible to employ the 2000 additional men that it is now proposed to put at work on the state highway system. One of the by-products of the budget system, as it applies to state highways, has been the creation of a reserve of construction projects, capable of being drawn upon to provide employment in times of depression. The reason for this is that the budget is for all practical purposes a program for highway construction prepared in advance for a two-year period. The preparation of such a program requires that the basic engineering on projects, proposed for inclusion in the program, be completed in advance of the presentation and adoption of the budget. It obviates the long delays for engineering investigation that frequently makes public works unavailable for relief to labor and business in times of stress. By reason of the fact that this basic engineering has been completed in advance on a large number of highway projects, California has been able to expand its highway building program in the past two years and is now able to further expand it, and to offer work to the public at a time when this work is most needed."

Value of Tourist Industry Told by U. S. Commerce Department

We hear much about the "tourist industry" being one of the state's largest industries. But outside of a general notion that "lots" of people visit California every year, and spend a good deal of money here, we seldom get any definite idea of just what the "tourist industry" means to the state in dollars and cents, says San Francisco *Business*.

Dr. Julius Klein, Assistant Secretary of the United States Department of Commerce, has made an exhaustive study of the way in which tourist money is diffused through the community. He arrives at the conclusion that it is distributed in the following percentages:

Six per cent goes for confectionery and sweets; 11½ per cent for garage and accessories; 10 per cent for transportation; 17 per cent for hotels or lodging, while 25 per cent is spent in retail stores. Restaurants receive about 20 per cent, while 8½ cents of the tourist's dollar goes for amusements or theaters.

Californians, Inc., estimated early in the spring of this year that 760,000 tourists would come to northern and central California during 1930. This estimate has now been borne out by the reports of the various transportation and tourist agencies, and the check on visiting pleasure cars at the various points of entry to the state.

Californians, Inc., also finds that the average tourist stays 5½ days, and spends, conservatively, \$7.50 per day. Using these figures and applying them to Dr. Klein's percentages, the organization finds that northern California's 1930 tourist crop is contributing about \$30,400,000 to the community in the following manner:

For hotel rooms or lodging.....	\$5,528,000
For restaurant meals and groceries.....	6,080,000
For clothes, novelties and souvenirs.....	7,000,000
For transportation, train, bus, steamer, plane.....	3,400,000
For tires, tubes, gasoline and oil.....	3,740,000
For movies, resort concessions, etc.....	2,584,000
For soda fountains, refreshments and candy bars.....	1,824,000

From all of which it appears that the tourist industry is indeed a profitable one for business in California. To be sure, no way has yet been determined of ascertaining accurately and exactly just how many tourists come to the state, and just how much they spend here. In the very nature of things, estimates on the subject can only be approximations, but all the evidence indicates that the calculations of Californians, Inc., are well within the bounds of probabilities, and for that matter are more than likely even too conservative.

Mrs. Bindler—"Is there any difference, Thomas, do you know, between a fort and a fortress?"

Mr. Binder—"I should imagine a fortress, my dear, would be more difficult to silence."—*Utica Press*.

Irrigation in California

By A. N. BURCH, Engineer, Irrigation and Irrigation Investigations, Division of Water Resources

IRRIGATION has been practiced in California from the time of the first Spanish settlements in 1769. However, the practice was not looked upon as of special importance until after the admission of California into the Union in 1850. In fact, for fifteen years after that period no striking progress in irrigation was recorded, but from 1865 to 1880 remarkable development was shown, particularly by the settlers in the southerly arid regions of the state. The area irrigated in 1880 is estimated at 300,000 acres, nearly all of which was located south of Madera County. All irrigation water was then supplied by private companies, by small mutual organiza-

difficulties which beset the irrigators. Many solutions of these problems were suggested. Among other things it was proposed that the federal government should purchase all water rights and canals in the state, construct storage and other necessary works and operate them for the sale of water to the landowners; or, if not the federal government, that the state should do all of these things. There were proposals to abolish riparian rights without compensation to riparian owners; and later it was contended that the state should adopt some comprehensive plan for developing all of the waters of the state and so adjust the rights to use such waters that the people as a



An irrigation scene in the Turlock Irrigation District

tions or by individually-owned works. Although diversion works and canals were generally crude and the use of water wasteful, the great benefit of irrigation in the production of crops was apparent. Even at that early day it was realized that the water supply was inadequate for the lands in the regions of the state where it was most needed, and there occurred rivalry and litigation and sometimes armed conflict over the rights to divert water and over the use of the water once it was taken from the streams.

Through all this contention the riparian doctrine, with the ukase that water should be allowed to remain in the streams "unpolluted in quality and undiminished in quantity," loomed large among the multitude of other

whole would derive the greatest possible benefit therefrom. However, it took about forty years to get this idea over, and it was not until 1921 that the legislature made funds available for beginning investigations definitely looking toward the working out of such a plan. Meantime, while the status of water rights has not greatly changed, legislation has been enacted which has served to materially facilitate the irrigation movement and has resulted in a very large development of the irrigation resources of the state, until now over half of the cropped land in the state is irrigated and our irrigated land represents 23 per cent of all of the irrigated area in the United States.

While many water conservation measures have been passed, no other legislation has

(Continued on page 18.)

The Feather River Gateway Bridge

THE largest concrete arch bridge span in California will be opened to travel when on November 28th, the Feather River Gateway Bridge will be formally dedicated.

The new bridge, of which the great concrete arch is the dominating feature, is situated on the Feather River lateral, a short distance above Oroville. Its location is one of surpassing beauty. The bridge itself was designed to take full advantage of the commanding scenery of the Feather River at this point. Massive concrete piers with battered sides and recessed buttresses, together with the graceful sweep of the arch, so harmonize the bridge with its setting that the structure gives the impression of having grown there.

The people of Oroville have planned an impressive ceremony to mark the dedication of the structure in connection with the annual Orange and Olive Exposition held there. Dignitaries of both California and Nevada have been invited to be present upon the occasion,

THE COVER PAGE PICTURE

The picture on the cover page of California Highways and Public Works is that of Miss Florence Johnson, formerly of Oroville and now employed in the Division of Motor Vehicles, Department of Public Works. The picture is that of the Feather River Highway Gateway Bridge, which will be dedicated on November 28th at Oroville.

the importance of which is enhanced by the fact that the ceremony will mark not only the dedication of one of the most important bridges on the state highway system, but will also mark the opening to travel of the first link in the Feather River Highway. This highway when completed will be an all-year route over the Sierras into California, and will open up to travel one of the most interesting and scenic recreational areas of the state.

The bridge itself crosses both the Feather River and the tracks of the Western Pacific Railroad at a point four and one-half miles east of Oroville. The over all length of the bridge is 757 feet 6 inches. The main arch, now the largest concrete arch in California, has a span 270 feet in length, and 145 feet in height above the river. A twelve story building could be placed beneath the struc-



Scene on the Feather River lateral above the new bridge. This portion of the highway was built by convict labor.

ture. On either side of the main bridge are two 84-foot spans. The river gorge proper is of solid rock with a sheer drop of over 50 feet on the south bank. The two largest piers are 108 feet in height.

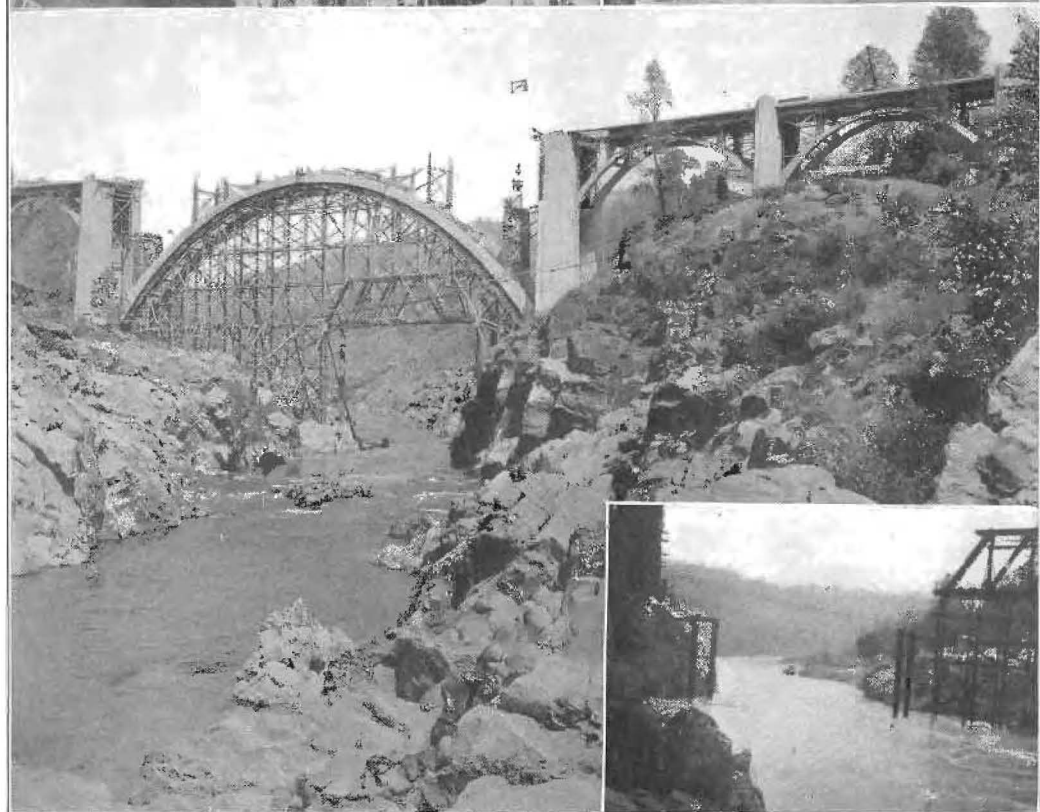
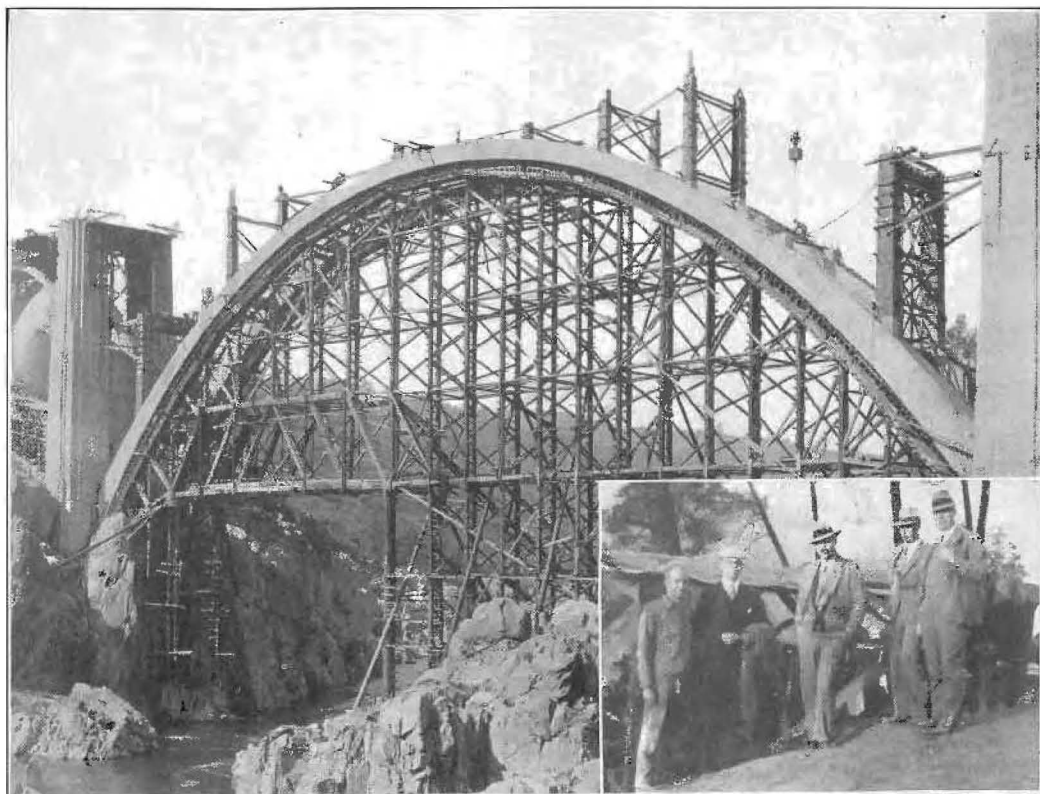
Approximately 6000 cubic yards of concrete and 283 tons of reinforcing steel went into the structure. Excavation of earth and rock amounted to 2400 cubic yards. Material was handled by a high line, set on 80 foot towers, 840 feet apart, carrying a movable carriage with which material could be lifted and placed at any part of the bridge. The structure cost \$170,000. Paul M. White of Santa Monica was the contractor, and I. O. Jahlstrom was the resident engineer for the Division of Highways. The bridge was designed by the Bridge Department of the Division of Highways.

The bridge connects with 4.06 miles of highway connecting the structure with the state highway system at Oroville. On its northern end it connects with 5.6 miles of highway built by a convict highway camp.

VIEWS ON OPPOSITE PAGE

Top picture, the concrete arch in the making. Inset, the men who built the bridge, left to right, Paul M. White, contractor; V. A. Endersby, Construction Engineer, Bridges, Southern Section; F. W. Panhorst, Construction Engineer, Bridges, Northern Section; H. D. Stover, office engineer, Bridge Department, and Chas. E. Andrew, State Bridge Engineer.

Bottom picture, view of bridge showing overpass of Western Pacific Railroad at extreme left. Inset, view of Feather River at bridge site.



How the State Secures Stability, Durability and Economy in its Buildings

By D. C. WILLETT, Associate Structural Engineer, Division of Architecture

IN THE design of a building, the first and foremost factor is utility, that is, designing the building for the purpose for which it is to be used. Another very important factor is the esthetic. These two are products of the architect. The mechanical



D. C. WILLETT

comforts of the building are supplied by the mechanical and electrical engineers. Stability and durability are dependent upon the structural engineer, and upon the economy with which these are obtained, his efficiency is determined. In the past, mathematics played but little part in design. What had been found by experience to be safe practice was handed down from one generation to the next. Progress through trial and error from one innovation to the next was necessarily slow; but scientific research has developed more or less accurate data on the properties of material, so that with our mathematical knowledge and skill the design of a structure is now an almost exact science, which takes into account all of the stresses to which the building may subsequently be subjected.

Approximately \$4,000,000 per year has been allotted to provide for the new buildings required by California's some sixty institutions. Between 40 and 50 per cent of this amount is spent in assuring the structural stability of the buildings.

The architect provides the structural engineer with plans and elevations of the proposed

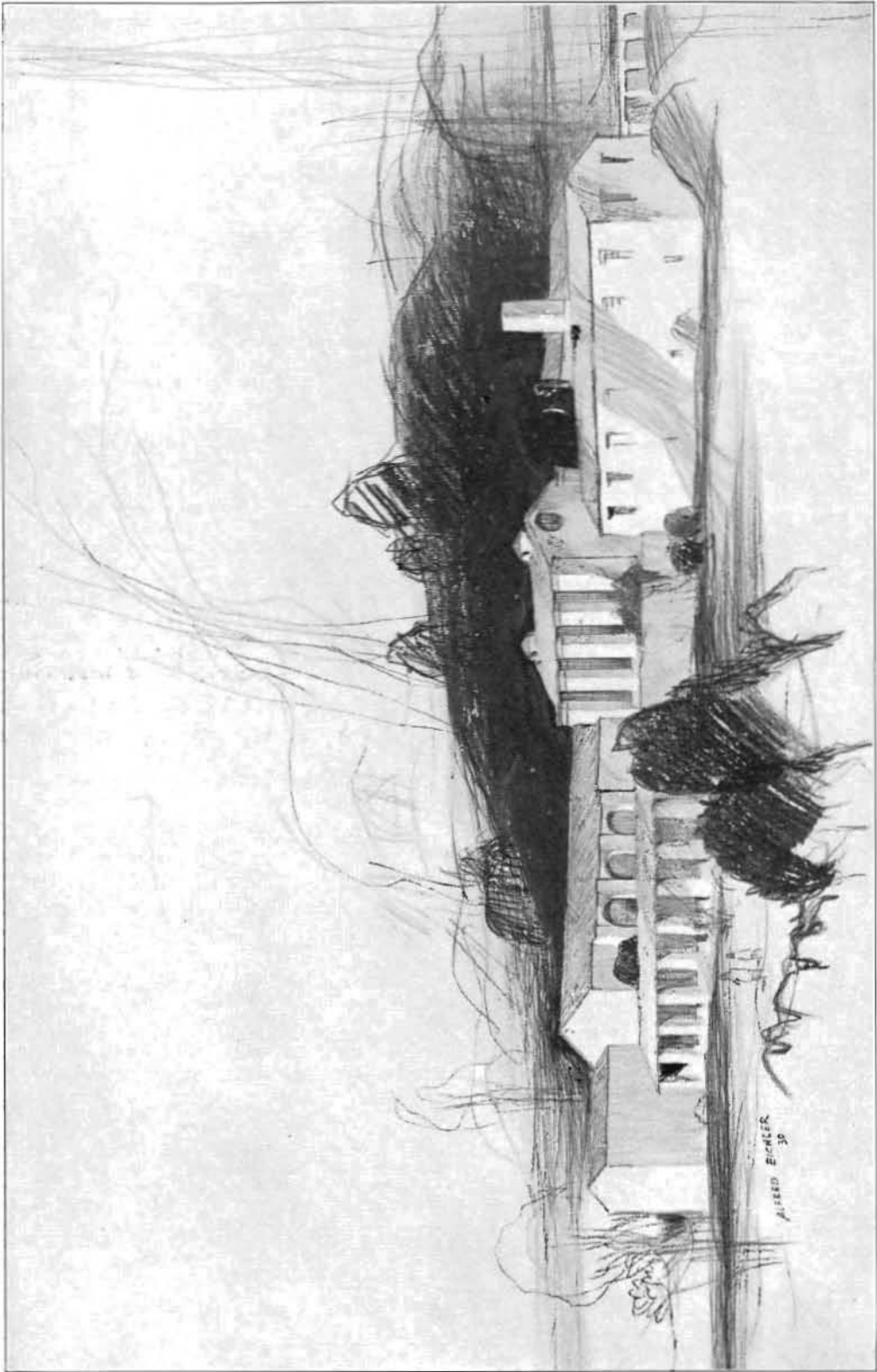
building. In providing for the structural stability of the building, the engineer attacks his problem in the reverse. The builder starts from the foundation, while the engineer begins from the roof and works down, providing for the loads as they accumulate from the roof and from floor to floor.

The first problem is: What are the requirements laid down by the architect? Knowing these, what is the most economical material to use that will give the stability and durability required? Determined upon the materials, the engineer first provides for the actual load of the materials, known as dead load, a constant load that must be carried. To this he adds the varied loads that are intermediately applied, such as wind, snow, and other applied loads, known as live loads. The next and important problem is: What is the deflection or permissible sag allowed in the various structural members?

Knowing the load and the permissible deflection, size of the structural members can be obtained. The limitation of deflection, and not the loads, determines the size of a structural member in many cases. In this way, the size of each structural member of the building is determined until the footings are reached. Knowing the loads from the structure above, and by predetermining the bearing value of the soil on which the building is placed, the size of the footings can be determined. In designing a foundation, it is important that the loads be equally distributed over the entire area so that unequal settlement will not occur to crack the building.

Not only is it important that the most economical material be used, but the most economical layout and use of materials must be had. An engineer may be able to design and properly provide for the superimposed loads that are to be carried, and at the same time be far from an efficient engineer. To this the state is always on its guard. There are many ways in which the structure can be framed, but some are more economical than others. An economical design should also be a balanced design; that is, a design in which the strength of the various units is equal, considering the loads carried. A chain is no stronger than its weakest link. So it is

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California's School for the Deaf, Berkeley. Kitchen and dining room of the primary unit is shown on the above picture. The building will be a reinforced concrete structure and will be erected in 1931.

Patrol Officers' Duties Cover Range From Saving Purses to Saving Lives

THE WIDE and varied service that the California Highway Patrol is called upon to give motorists of California is reflected in scores of appreciative letters received during the month by the Division of Motor Vehicles.

Excerpts from just a few of these letters follow:

Woman Saved From Drowning.

Captain J. E. Blake reports a summer occurrence as follows:

About 5.30 p. m., Officer Francis (Tony) Beard was hailed on the Donner Lake highway about three miles from Truckee by a man named Brown.

Officer Beard stopped his car and found that there was a woman drowning in Donner Lake. He immediately jumped from the car, dived into the lake and swam about 40 yards to the woman, Mrs. Leida Brown of Reno, who was going down for the second time. He grasped her and swam safely to shore.

This rescue was made by Officer Beard while in uniform, as he did not have time to remove any clothing.

Lost Purse Found.

From Santa Monica comes the following letter:

In July, 1926, I was journeying northward to Berkeley with my infant son and about nine miles north of King City I encountered engine trouble and also discovered I had left my purse at King City. Fortunately for me, Mr. Reinhold came along and not only made three attempts to phone to King City trying to locate my purse, but went two miles out of his way to procure water for the radiator of the car (which lack of water was causing the trouble). At the fourth farmhouse he visited he located a phone and succeeded in locating my purse.

Caution Brings Commendation.

An attorney of Los Angeles writes as follows:

I was stopped on the highway by your Traffic Officer No. 385, yesterday. He cautioned me for what he said was a trivial infraction of traffic law. On this point I disagreed with him, but that is not the purpose of writing this letter.

This officer was unusually courteous and gentlemanly. This so impressed me and the passenger I had in the car that I decided to let your office know that at least one motorist will take the time and trouble to compliment your traffic department and encourage your office and particularly Officer No. 385 in its policy of true law enforcement.

Hit and Run Driver Captured.

This letter is from a Hayward autoist:

I wish to commend the promptness with which Officer George Nardi, No. 242, of Sonoma, captured a hit and run driver who damaged my car on July 6th, endangering the lives of my passengers, the efficient manner in which he acted during the time, held the above driver in custody, and also the manner in which he officiated at the trial of those concerned.

Tire Change Brings Praise.

The following letter from Riverside is self-explanatory:

I was driving with another woman on the lonely road leading to San Juan Capistrano from San Juan Hot Springs. It was about 7 o'clock and very dark. We had a blowout, and while we were waiting there without either equipment or skill to fix it, and miles from a garage, two men came along. We asked them to send back help for us, but instead they stopped and changed the tire. They refused to take any money for the service, and when I asked their names one of them said he was Captain Meehan of Orange County.

Officer Proves Expert in Repairs.

A San Francisco attorney writes in as follows:

On Sunday, July 6, 1930, about 2.15 p. m., between Placerville and Folsom, about eight miles from Folsom, a party of four of us were traveling in an automobile, and by reason of motor trouble, were unable to proceed any further, and were unable to locate our trouble. The officer of the State Highway Patrol in that vicinity on duty, patrolling on a motorcycle, within a few minutes located and cured the motor trouble which had developed. The trouble was of an unique nature and something that would probably happen once in a lifetime.

Unfortunately, in the excitement of getting away, we neglected to obtain the officer's name or badge number, and can only describe him by his location at the particular time above mentioned.

Stolen Car Recovered.

A Long Beach autoist makes the following report:

Your patrolman, Mr. Geo. W. Peterkin, recently did such a wonderful job of recovering my automobile for me and catching the thieves that I want to send you a note telling you that he is a real fellow and understands his business thoroughly. He caught these fellows entirely on suspicion, having no report at all that the car had been stolen, and my car was returned to me immediately.

High School Cooperation.

The following letter is from G. J. Badura, principal of the Fortuna High School, to Mr.

(Continued on page 19.)

Auto License Renewal Period Approaches

BY FRANK G. SNOOK, Chief of the Division of Motor Vehicles

WITHIN a few days the Division of Motor Vehicles will be engaged in its annual task of renewing the licenses of more than two million motor vehicles.

The stage is all set for the task, which promises to be greater than in any previous year. Best available estimates at this time indicate there will have been from 80,000 to 100,000 more cars registered in California in 1930 than in 1929.

In order to provide faster service to the public as well as to "get the jump" on the job we will start receiving applications by mail, as we did last year, on December 1st. These applications will come directly to Sacramento where a large staff of clerks will sort them, type the certificates and put the plates in shape for mailing right after the holidays.

On December 15th we will throw open our counters at Sacramento and at our branch offices, located in Los Angeles, San Diego, Long Beach, Fresno, Oakland and San Francisco, and will receive direct applications for new plates.

Motorists making application in person will receive their license plates at once while certificates will be forwarded to them by mail at a later date.

During the height of the renewal season as many as 2000 persons will be employed. Fortunately for us we do not have to depend entirely on green help as past years have served to train a large number of persons who come in each year and assist us for the short period they are needed.

The task of handling so many license renewals in so short a time is one of great magnitude and must, of necessity, be attended with some confusion because the human element is involved.

It is our hope, however, to get through with a minimum of mistakes and if delay occurs in an occasional case we ask the indulgence of the public.

Under our law all licenses expire at midnight December 31st. Motorists are required to apply for a new license within fifteen days after that time.

January 15th will, therefore, be the "deadline" in making applications although those who can show they have made application are permitted by law to operate fifteen days more.

In addition to the service we ourselves will give, some 120 branch offices of the automobile clubs will assist us by distributing plates to their members. This work on the part of the clubs saves the state many thousands of dollars in overhead expense annually.

During this renewal period we probably will collect in excess of \$6,000,000, the major part of which will go back to the motorists in the form of better roads. California motorists certainly have little to complain of as our fees for registration are cheaper than any other state and the moneys collected all go for building and patrolling the roads and in paying the expenses of the division.

Fees for both pleasure and commercial vehicles are exactly the same as last year.

It is important to remember that all vehicles under 3000 pounds unladen pay a straight fee of \$3 whether used for pleasure or commercial purposes, this change having been effected by legislation which became effective last year.

Owners who have for any reason decreased or increased the weight of their vehicles are required to state the change in making application for license renewal.

We are encouraging the motorists to forward their applications by mail to Sacramento instead of appearing in person. We find it is not only easier and cheaper for us to handle such applications because of their volume but that it is a great accommodation to the motorist inasmuch as it saves him the time and annoyance of a special trip to a branch office where he may be required to stand in line for some time before he can receive service.

The importance of getting the applicant's present proper address is stressed constantly. The only application we require is the white certificate of registration mailed along with the fee. If the applicant has changed his address during the year and does not make the change on his certificate when he sends it in, his plates will go to the wrong address and he will be subjected to delay.

This point can not be stressed too much for every year thousands of motorists fail to observe this instruction.

Another point we have trouble over is getting the motorist who has paid off the contract on his car during the year to have the legal owner sign over the pink certificate to him.

In such cases we require a fee of \$1 for the transfer, in addition to the regular fee.

A few figures on our registrations may be interesting at this point. At this writing the only totals available are those of October 1st. These show a total of fee-paid registrations for the year to that date of 2,048,131 divided as follows: Automobiles, 1,897,807; solid tire trucks, 15,299; pneumatic tire trucks, 79,774; motoreyes, 8973; solid tire trailers, 9321; pneumatic tire trailers, 36,957.

Fee-paid registrations for 1929 totaled 2,026,868. Thus there was a gain for 1930, up to October 1st, of 21,263. Our estimate of 60,000 more for October, November and December would make the year's gain about 81,000.

This is not as large a gain as in previous years but considering general business conditions we regard it as very good.

THE HIGHWAY

From the trail I was but yesterday,
From jog and wiggle and hollow and hump,
From mud and dust and chuck and bump,
I've smoothed my form to the great Highway.

With a graceful sweep of line and grade,
With cut and fill to a figured plan;
Or leaping the gorge with a magic span
I challenge the best that man has made.

I glide through fields aglow with flowers—
Cheery fields where the warm sun smiles.
I thread the maze of forest aisles
Where Wood Nymphs dance in elfin bowers.

I climb the peaks where lone crags dim
To purple mists with the Evening Star.
I crawl where the broad Stream gleams afar
From my eerie ledge on the canyon's rim.

I explore wide wastes of desert lands
Where the Rulers of Silence dwell
In grandeur more weird than the Lords of Hell
Could mould with myriad Demon hands.

I follow the shore of the majestic Sea,
Where a restless surge chafes the mighty bowl;
And all things merge with an Oversoul
In the vast dim sweep of Infinity.

I call men away from the toiling throng
And bear them afar on humming wheel,
That rings with a message all men feel
Where the open space breathes a wordless song.

It may be the thundering tread of War,
Or wheels of Pleasure, or wheels of Trade,
But there's no rival yet of things man-made
For a good Highway and a motor car.

—ANON.

DRAINAGE SUMPS

By E. EVANS, District Maintenance Engineer

In the San Joaquin Valley, traversed by the Golden State Highway, or State Route 4, are many sags or pockets with no natural drainage outlets, or regions of very slight gradient where irrigation systems have long been in operation, where a condition obtains by reason of which it would be very expensive and difficult to drain the highway by utilizing natural drainage channels.

In Tulare and also in Madera counties, a large measure of relief has been obtained by



View of sump.

constructing dry wells or drainage sumps. The standard sump is eight feet by four feet in plan, and in depth varies from eight feet to twenty-three feet. The depth to which they are carried depends on the tightness of the soil. It is very desirable to reach a coarse sand or gravel stratum which will be pervious. If satisfactory pervious material is not reached at a reasonable depth, the bottom is loosened with powder.

When a depth is reached which shows satisfactory material or beyond which it seems impracticable to excavate, the hole is filled with boulders or broken concrete of approximately uniform size ranging from first size to about twelve inches maximum dimension. The top may be finished off with crushed rock or gravel. In certain cases it is desirable to convey the water from the ditch to the center of the sump by pipe or other means, to prevent caving in of the sides and consequent sealing.

Of those installed in District VI, it is estimated that 10 per cent are complete failures, 40 per cent give results which are worth while, and the remainder give complete satisfaction.

Roadside Clearing on State Highways Pays Big Dividends in Fire Prevention

By M. B. PRATT, State Forester

THE roadside clearing program of the Division of Highways paid big dividends to the State of California this year. It was instrumental in preventing scores of fires in the state and in saving property owners many thousands of dollars in



M. B. PRATT

potential property damage to forests, grain fields and range.

This has been determined by means of a statewide survey just completed by the Division of Forestry through its rangers in all parts of the state.

Each ranger was requested to relate the benefits of roadside clearing in his particular district, the benefits that could be derived if other areas were cleared up, the number of fires that have started along the highway where roadside clearing has not been done, and the number of fires started where it has been done.

The replies were very enlightening. In 22 out of the 28 counties reporting there had not been a single fire this year along highways that had been cleared. In the remaining five counties there had been only seven fires along highways that had been burned.

COUNTIES WITH CLEAR RECORDS

The counties reporting no fires along cleared highways were: Mendocino, Sonoma, Yuba, Trinity, San Benito, Lassen, Tuolumne, San Diego, Siskiyou, Lake, Riverside, Amador, Madera, Tehama, Fresno, Butte, Napa, Santa Clara, Orange, San Luis Obispo, San Bernardino and Santa Cruz.

The five counties reporting fires along areas that had been burned were: Santa Barbara 2, Shasta 2, Tulare 1, Colusa 1, and Monterey 1.

ON UNCLEARED HIGHWAYS

In the counties reporting, a total of 89 fires swept over land adjoining highways that had not been cleared, as follows: Mendocino 1, Shasta 2, Sonoma 5, Yuba 7, Trinity 3, San Benito 6, Lassen 3, Tuolumne 4, Lake 6, Amador 2, Madera 1, Tehama 14, Colusa 8, Fresno 6, Butte 1, Monterey 1, Santa Clara 5, Orange 8 and San Luis Obispo 4.

This is a record of which not only the Division of Highways but the entire State of California may well be proud. To estimate the fire damage prevented by this method in dollars and cents would be an impossibility. But it is sufficient to say that the property saved was worth many, many times more than the state outlay involved in clearing the highways.

STATE PROTECTED

The writer can remember only a few years ago when California's State Highway Commission refused to do any roadside burning



Logging in the older days.

on the ground; that if a fire should get away from a crew the state didn't want to be held responsible for any damage it might do.

The present system of obtaining the consent of the owner before any burning is done along his property has proved to be a protection both to the state and to the owner.

FIRES CAUSED BY CARELESSNESS

Virtually all roadside fires are caused by cigarettes or matches carelessly tossed out of automobiles by motorists or their passengers. The roadside clearing program has nearly eliminated fires from this cause. It has also made it much safer and more convenient for



A highway slope cleared of inflammable material.

campers to park their cars along the roadside for lunch. In Colusa County ranger Charles D. Wilcher says the clearing of roadsides "is keeping down the star thistle, which is fast becoming a nuisance to crops in this valley."

SAN BERNARDINO FIGURES

Before the roadside clearing in San Bernardino County, there was approximately one fire to every 10 miles of highway in grass land, ranger A. T. Sharp reported. This year there has not been a single fire in that county where the highway was properly cleared, and this includes the Waterman canyon road, where more than 100,000 cars travel annually.

"One of the Motor Transit trucks was completely destroyed by fire," Sharp wrote, "on the Waterman Canyon road. This was within a high brush-covered area and no fire equipment was handy. Due to the clearing along

the highway the fire did not escape. Without the clearing it would have spread into the brush and caused considerable damage to the watershed."

TEHAMA COUNTY REPORT

In Tehama County, ranger R. H. Gossett reported, there have been no fires on either the west side highway south of Red Bluff or on the east side highway to the Butte County line. On other uncleared roads in the county there have been 14 fires to date.

EL DORADO COUNTY

Out of a total of 111 fires in El Dorado County, only one was started along state highways that were cleared, according to ranger W. C. Austin.

KERN HAS GRAPHIC STORY

Another outstanding example of the effectiveness of this clearing work may be found in Kern County, on the Bakersfield-to-Tehachapi lateral. In 1928 there were at least 12 roadside fires on this highway, reported ranger Harold P. Bowhay. In 1929 and 1930 the road was cleared, and thus far this year there has not been one fire reported.

ALONG REDWOOD HIGHWAY

How the giant redwoods along the famous Redwood highway have been protected from destruction was told briefly by ranger A. A. Wilkie of Sonoma County, who said: "Clearing that has been done on the Redwood highway in this county has held the fires down 100 per cent."

Before roadside clearing was done in Mendocino County, at least 25 per cent of the fires started along the highways, from campfires or discarded cigarettes. Since this work has been carried on, Inspector R. E. Roach reports the number has been reduced to almost nothing.

TESTIMONY FROM TAIHOE-UKIAH ROUTE

The importance of continuing the highway clearing work on the scenic Tahoe-Ukiah route was stressed by ranger W. F. Sharp.

"This highway runs through a very dense growth of timber of about an average age of 40 years," he said. "This area has been logged off in the last few years and a great deal of the old slash is still on the ground, together with a very thick stand of small cedar understory which is about 6 to 8 feet high.

"I understand that the right of way along this highway is 600 feet wide for most of the way, so if we were able to clear only part of the roadside this winter it would be a still

(Continued on page 13.)

HOW THE STATE SECURES STABILITY, DURABILITY AND ECONOMY IN ITS BUILDINGS

(Continued from page 6.)

with a structure. In other words, it is a waste to design or build one unit stronger than necessary or twice as strong as another carrying corresponding loads.

STRUCTURAL MATERIALS

The many structural materials now used can be classed in four general groups, which are, timber, masonry, steel and concrete.

In the determination of the material that will be used in any building, consideration is given to the relative merits and demerits of the various materials named above, with particular reference to the use to which the building is to be put and any peculiar condition that may characterize the site. It is these conditions that determine the real cost of the material, and the economy of its use.

Without entering into the discussion of the relative strength or weakness of these materials, it might be well to add a word relative to concrete.

CONCRETE

Concrete differs from most of the other structural materials in that it must be manufactured at the job. Reinforced concrete has become a universal material in construction and is proving a very durable one even with the careless methods of construction. From a financial standpoint, speed is of prime importance to construction; but this demand for speed and time saving has resulted in careless working methods, thus reducing the strength of concrete. Physical characteristics of concrete are determined not only by the quality of the several materials which enter into it, but perhaps to a greater degree by the proportions in which the materials are mixed; for the proper proportioning of fine and coarse aggregates may double the strength. It is a matter of common experience that the old method of arbitrary selection in which fixed quantities of fine and coarse aggregates are mixed without regard to the size and grading of the individual materials, is far from satisfactory. Not only is it essential that the aggregates be properly graded and proportioned, but the proper amount of mixing water must be used. Tests have shown that "an increase of 13 per cent in the mixing water caused the same reduction in strength as if 33 per cent of the cement is omitted."

The aggregates, which form about 85 per cent of the structural material of a concrete building, are in cases obtained at or near the institutions. This tends to a greater economy of concrete.

The proper placement of the reinforcing in the concrete is another very important feature in concrete construction. Allowing the reinforcement of the average floor slab to be dropped one-half inch from the figures shown is equivalent to a reduction in the strength of the slab of approximately 30 per cent.

By the proper selection of the structural materials, the economical use of these materials, providing properly for the loads to be carried and by proper and intelligent inspection, eliminating the carelessness in construction, is the state provided with stable, durable and economical buildings.

ROADSIDE CLEARING ON STATE HIGHWAYS PAYS BIG DIVIDENDS IN FIRE PREVENTION

(Continued from page 12.)

greater step in the reduction of the present fire hazard, say about 100 feet on each side of the pavement, and another time by clearing another strip."

Dead trees and snags present another problem in highway clearing that deserves careful attention of everyone concerned, because they constitute not only a traffic hazard, but also an extremely dangerous fire menace.

NEED FOR SNAG REMOVAL

Through the courtesy of T. H. Dennis, maintenance engineer, it has been brought to our attention that there are some 2836 snags, by actual count, in Highway District Two.

It would cost approximately \$20,000 to dispose of the snags in this district, Mr. Comley estimates, and an additional \$30,000 to clean up slash and other debris in connection with this snag disposal along the highway.

The condition in the rest of California in the timbered areas is very similar to that of District Two. Although great strides are being made in cleaning up the highways, I am convinced that this is a phase of the work that should be given early attention.

It is hoped that funds may be made available for the purpose of cleaning up dead trees and snags as a further step in the splendid work that has thus far been completed by the Division of Highways in its roadside clearing program.

Tunneling for Highway Under Town

By RICHARD H. WILSON, Office Engineer, District III

ONE'S FIRST association with the word "tunnel" is a hole through a hill through which a railroad train may pass. However, with the present-day standards of highway improvement, the construction of tunnels has become a necessity to accommodate modern road traffic problems.

The latest highway development of this character is now under construction at Newcastle, in Placer County, where a tunnel, 531 feet long, is being driven under a portion of the town and incidentally under the main east-west line of the Southern Pacific Railroad.

Newcastle is located between Roseville and Auburn on State Route 17 and Government Route 40, which road, aside from its local importance, is a portion of one of the main trancontinental highways.

Newcastle is one of the original small towns established in California's early days when high speed automotive traffic was not even a dream. Situated on a high knoll as it is, its tortuous narrow streets lend themselves to most anything else than the condition expedient for boulevard construction, and the necessary widening and straightening would have practically wiped out the small city.

As the Southern Pacific Railroad must be crossed at this point, and is of such height as to allow the construction of an underpass, all other tentative locations, after careful weighing of such factors as cost, alignment, grade, and public convenience and safety, were abandoned in favor of the more direct route through the hill under the town and the railroad. A few of the salient features of a comparison between the present traveled way and the new location may be readily visualized by scanning the tabulation given below:

Comparison of present highway and highway under construction:

	Highway under construction	Present highway	Difference favoring new route
Length	6182 ft.	7600 ft.	1418 ft.
Total rise	148 ft.	219 ft.	74 ft.
Adverse grade	None	74 ft.	74 ft.
Minimum radius curve	1500 ft.	50 ft.	---
Maximum grade	5.12%	*8.00%	---
Minimum width roadway	46 ft.— 30' in tunnel	21 ft.	---
Total central angles in curvatures	71°	670°	599°

*2260 feet of present grade is 7.80% or greater.

In addition to the problems stated, the new location involved many local problems which necessitated a great deal of care and planning. The present water and sewer system of the town must be entirely changed and several houses moved; two county roads and the main ditch of the Pacific Gas and Electric Company had to be relocated so as to pass on the railroad sides of the tunnel portals.

Preliminary borings were taken and the elevation of the grade of the tunnel established so that its entire length is in solid granite. This established the elevation of the grade of the tunnel under the Southern Pacific tracks a depth of approximately 86 feet below the base of rail.

The roadway of the new section is normally 46 feet in width, narrowing to a paved 30 feet through the tunnel and heavy approach cuts with a three-foot sidewalk on either side. The center line clearance of the tunnel is 20 feet 9 inches.

Three types of lining will be used, the sections at the two ends and the section immediately under the railroad tracks being concrete and the balance being redwood timber lined, heavy and light types.

An electric lighting system is also to be installed, which should eliminate all hazards from that angle.

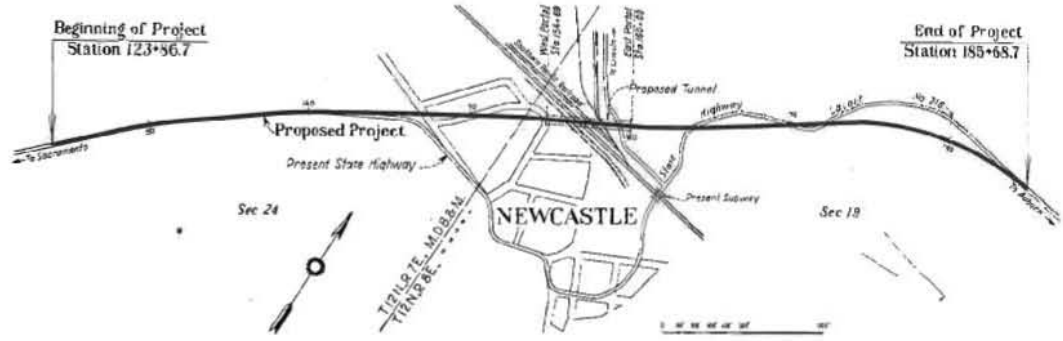
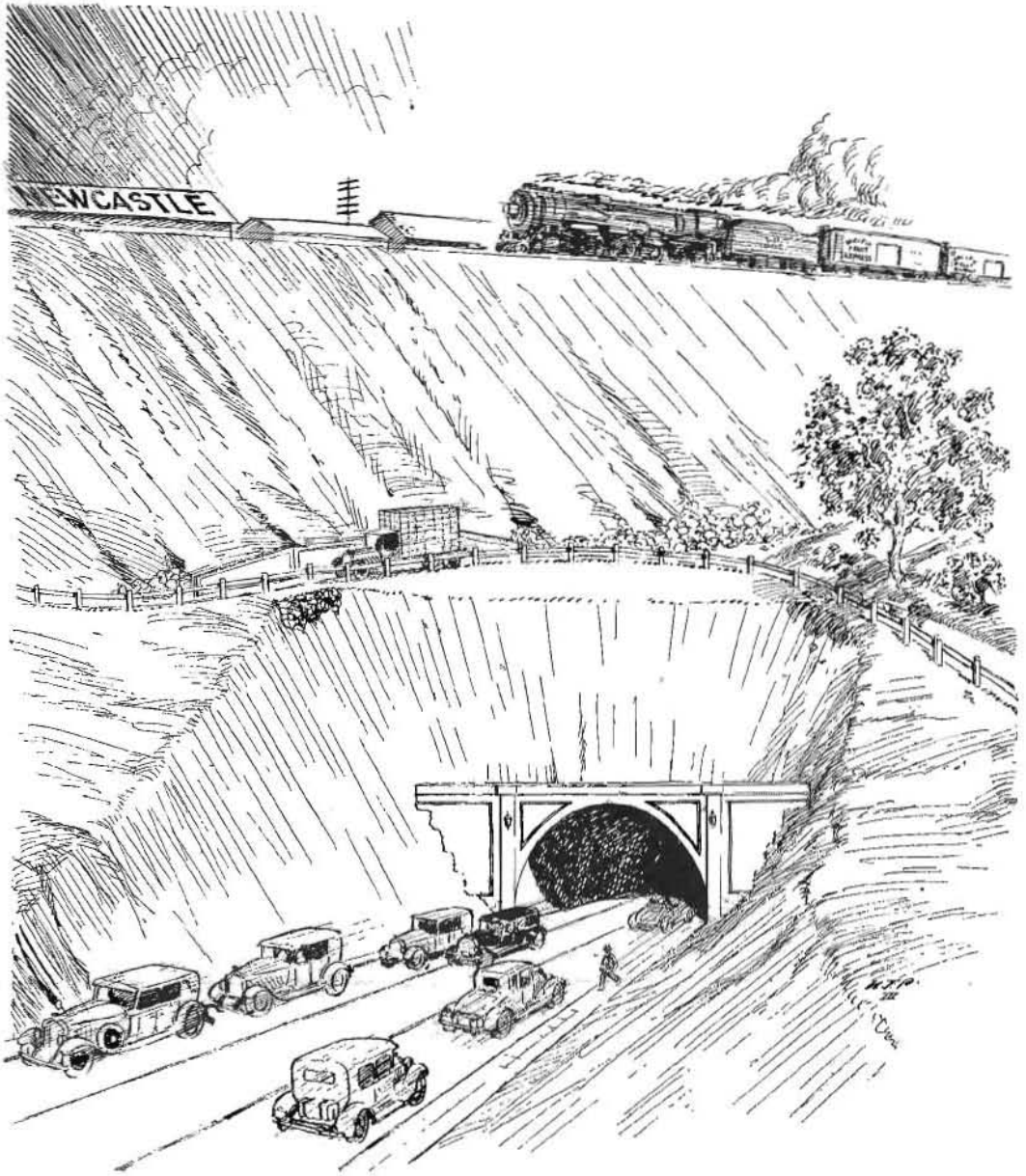
The actual cost of tunnel itself, including boring, lining concrete portals, lighting, and contingencies, is \$121,500, or approximately \$230 per lineal foot.

The total estimated cost of the project now under contract, 1.17 miles in length, is approximately \$225,000.

Work started on this project on September 2, 1930, and the date for completion is May 27, 1931.

The T. M. Morgan Paving Company is the contractor, C. H. Whitmore is district engineer, and J. W. Trask is resident engineer in immediate charge of the work under C. Cleman, district construction engineer.

THE SKETCH ON THE OPPOSITE PAGE shows the new highway at Newcastle with its tunnel beneath the town. The lower map shows the beginning and ending of the project with reference to Newcastle.



Outdoor Christmas Trees For California's Highways

By JEAN SCOTT FRICKELTON

CALIFORNIA highways are winning fame throughout the nation as the "roads of Christmas-out-of-doors."

Not only are homes and public buildings transformed at Christmas time into the settings for scintillating outdoor living trees for everybody to enjoy, but our highways are becoming part of this general festive decoration plan, sponsored by an association of progressive and beauty-loving citizens.

Highway beautification has long been a popular cause, but stimulated by the Outdoor Christmas Tree Association of California, ambitious plans are now being made by many communities throughout the state which are destined to result in the planting of many miles of stately Christmas trees along the highways.

When the last outdoor Christmas tree campaign was launched for the 1929 holiday season, Clarence F. ("Sandy") Pratt of San Francisco, state president and founder of the association, interested the city of San Francisco in decorating and illuminating a "Mile of Living Christmas Trees" in the Panhandle of Golden Gate Park. Everybody knows the result. During the ten-night period that the colorful lights were turned on, thousands of motorists, thrilled with the beauty of this spectacle, came to admire and enjoy this great outdoor Christmas tree party.

These motorists were not San Franciscans alone, for as the news spread, Mesdames and Messrs. Sacramento, Salinas, San Jose, Fresno, Redding, Tulare and way points visited the site and put their official stamp of approval on the outdoor Christmas tree movement.

As a result, before Christmas had even arrived, the Outdoor Christmas Tree Association received word that Santa Cruz and Watsonville were hatching up a scheme to go San Francisco one bet-

ter and, instead of just one mile of trees, they were going to illuminate twenty miles of trees between the two cities, to form a mighty illuminated parade of giants of the forest whose fame would spread far and wide. The mayors of the two cities held frequent conferences and, although the twenty miles is still unaccomplished, the project has been started with the planting of two miles of trees extending out of Watsonville.

The popularity of the movement resulted in the Outdoor Christmas Tree Association's decision to incorporate into its activities this highway beautification plan by advocating that each town and city in California plant a mile of living Christmas trees along the highway leading into the city or along the main artery within the city. Thus tourists as well as residents would be able to enjoy California's outdoor Christmas, and between yuletide celebrations the trees would be enjoyed for their beauty and shade.

Soon service clubs, chambers of commerce, garden clubs, women's organizations, school children and various other groups began to communicate with the Outdoor Christmas Tree Association inquiring for instructions on highway planting or announcing plans for



An outdoor Christmas tree on the State Highway at Selma.

their own communities. The association decided to sponsor an arbor day to provide a uniform occasion for the planting of outdoor Christmas trees, and set aside March 7, which happened to be Luther Burbank's birthday, for this purpose.

Many towns throughout the state joined in with a vim. School children took part. Some even staged parades. The town of Gilroy was one of these, planting more than half a mile of trees on the Hecker Pass.

Some of the other communities who launched their "Mile of Living Christmas Trees" program during the year include South San Francisco, which is planning its mile on the highway near the railroad track so that tourists can enjoy the picture; Tulare on the Golden State Highway; Auburn and Lincoln on the Lincoln Highway; Sausalito at the end of the Redwood Highway; San Jose, with its mile of trees along The Alameda; Bakersfield along the Golden State highway toward Delano, and many others. Altadena, in southern California, has had its mile of Christmas trees for several years.

B. B. Meek, director of California Highways and a director in the Outdoor Christmas Tree Association, is of the opinion that the ideal way to plan highway beautification through Christmas trees is to place the trees in groups of a quarter or a half mile, instead of in one continuous line. This plan would present a series of inspiring pictures to the traveler.

As plans progress for the 1930 yuletide season, all indications point to an even greater public response to the tree-planting movement. With momentum growing yearly, California highways in future years are bound to provide a treat of natural beauty not only for our own citizens, but also for the throng of tourists who motor from one end of this state to another. California's highways are one of her greatest assets. When we unite in planting trees—particularly the universally beloved Christmas trees—along the edges, this state will have just cause for even more pride in its roads.

Despite an increased registration of motor vehicles and an increased number of fatalities due to motor vehicle operation in the country during 1929, fatalities in railway crossing accidents during the year were actually reduced 3 per cent according to the Grade Crossing Committee of the Association of Railway Claim Agents.

Two little boys came into the dentist's office. One said to the dentist: "I want a tooth took out, and I don't want no gas, because I'm in a hurry."

Dentist: "That's a brave little boy. Which tooth is it?"

Little boy: "Show him your tooth, Robert."

THE ARMY OF CIVIL ENGINEERS

By ALFRED DAMON RUNYAN

No bands are playing gaily when they're going into action,
 No crowds are cheering madly at their deeds of derring-do;
 They are owing small allegiance to any flag or faction—
 Their colors on the sky-line and their war cry, "Put it through!"

Ahead of bath and Bible and of late repeating rifle,
 The flags can only follow to the starting of their trail;
 They herd the leagues behind them, every mile the merest trifle;
 They mark the paths of safety for the slower sail and rail.

They work the Quite Impossible; they scoff the earth and water—
 They've solved the problems of the air and found them easy, too.
 They quell the ocean's raging, the mountain's fearful hauteur,
 As they march toward the sky-line with the war cry, "Put it through!"

Their standards kiss the breezes from the Arctic's cooling ices
 To where the South Pole's poking out its undiscovered head;
 You can see their chains a-snaking through the lands of rum and spices
 And East and West you'll always find their unrepinning dead.

No time for love and laughter, with their rods upon their shoulders,
 No time to think with vain regret of home or passing friends.
 They are slipping down the chasms, charging up the mighty bowlders.
 The compass stops from overwork; the pathway never ends.

They slit the gullet of the earth, disgorge its hoarded riches
 (But life's too short for them to stop and snatch a rightful share);
 They've a booking on the Congo, putting in some water ditches;
 A dating to take tea with death, they make it by a hair!

You will find their pickets watching in the unexpected places;
 You will hear them talking freely of the Things-That-Can't-Be-Done;
 Oh, the Faith they speak so strongly and the Hope that's in their faces—
 It lights the gloom of What's-the-Use as brightly as the sun!

No bands are playing gayly and no crowds are madly cheering;
 No telegraph behind them tells their deeds of derring-do;
 But forward goes the legion, never doubting, never fearing—
 Their colors on the sky-line and their war cry, "Put it through!"

IRRIGATION IN CALIFORNIA

(Continued from page 3.)

given such impetus to irrigation development in California as has the irrigation district law. This law confers on a farming community the right to organize into a self-governing corporate body, with the power of eminent domain, the power to tax all real property and the right to issue bonds to become a lien on all real property within the organized district. The purpose of such organization is to provide and distribute water for irrigating the lands in the district.

The first comprehensive California irrigation district law was passed in 1887, and was known as the Wright Act. In 1897 the Wright Act, which on the whole did not prove workable, was repealed by the enactment of the Bridgford Act. The latter act, through a great many amendments as well as through supplemental legislation, has developed into our present California irrigation district law. Under this law, certain state agencies are concerned in the major operations of organizing and financing irrigation districts. Organization is initiated through a petition to the county board of supervisors who, if they find the petition sufficient, refer the same to the State Engineer for investigation and report on the feasibility of the project. If such report is favorable the supervisors call an election at which the question of organization is decided by a majority of the ballots cast by those qualified by the general election laws of the state to vote in the district. Districts are governed by elective boards of directors, to whom the law delegates the management of all district affairs. Questions of incurring special indebtedness must be submitted to the voters, but in all other matters of internal management the directors have complete control.

IRRIGATION DISTRICT BOND COMMISSIONER

In 1913 the legislature passed the Irrigation District Bond Commission Act, creating a commission consisting of the Attorney General, the State Bank Superintendent and the State Engineer; this commission to be of service in financing irrigation districts should such service be requested. Bond elections may be authorized and called by directors of districts with the approval of the bond commission, or such elections may be called without the approval of the bond commission through petitions of a majority of the landowners, representing a majority of the assessed value of the land in the district. If it is desired that irrigation district bonds be certified by the

State Controller as legal investments for public funds, savings banks, etc., they must be submitted to and recommended by the bond commission for such certification. If bonds are certified, then all expenditures for funds realized from their sale are placed by law under the supervision of the bond commission. Districts can not legally enter into certain contracts without the approval of the commission.

Besides the many direct contacts with irrigation districts provided by law, the State Engineer acts as the agent of the bond commission in many of its relations with the districts. His office is required to investigate the feasibility of any proposed bond issues, to investigate, check and report on all plans submitted to the bond commission for expenditures on construction work or for any other proposed expenditures. It is also the state agency through which engineering investigations are made and through which expenditures approved by the bond commission are supervised.

DEVELOPMENT DURING BIENNIUM

While there has been little encouragement for the extension of agriculture during the present biennium, five petitions for the formation of new irrigation districts were received by the State Engineer. Three of these, involving a total area of about 40,000 acres, were approved and proceeded to organization. During the biennium, major transactions of irrigation districts with the State Engineer and the bond commission involved consent to the voting of bonds in the amount of \$640,000, the recommendation for certification of \$1,349,731, and the consent to the private sale of \$452,500, in bonds. Expenditures approved for irrigation districts amounted to \$1,528,623, and for water storage districts \$942,731, or a total approval by the bond commission, under the recommendation of the State Engineer, of \$2,471,354.

EIGHTY-NINE OPERATING DISTRICTS

There are now 89 districts actively operating under the California irrigation district law, all but seven of which have been formed since 1910. The total area embraced within the boundaries of these districts is 3,520,000 acres, and of the estimated total of 4,400,000 acres irrigated in California in 1930, more than two-fifths was contained within their boundaries. Twenty-one irrigation districts own or control reservoirs of a combined storage capacity of 1,150,000 acre-feet. Reliable data on the amount of water used by all districts are difficult to obtain, but 66

irrigation districts reported a total diversion of 6,366,000 acre-feet in 1929.

EXTENT OF BOND ISSUES

The financing of California irrigation districts has been largely through the sale of bonds. To January 1, 1930, the districts had sold \$108,326,221 in serial bonds, and of the total sold had retired \$11,234,339. The total financial transactions of irrigation districts during the year 1929 involved the payment of \$6,900,000 for bond interest, bond retirement and the retirement of other interest bearing obligations, and approximately \$4,600,000 for betterments and for the administration, operation and maintenance of their irrigation systems, a total of \$11,500,000, all from revenues derived from land taxes and water sales.

CONSERVATION DISTRICTS

In addition to the irrigation district act, California has passed several conservation district laws of general application, under which irrigation may form a part or the whole of the object of organization. Reclamation and drainage laws provide for the organization of districts for reclaiming swamp and overflowed lands and for any necessary irrigation of such lands after they are reclaimed. California has about 2,275,000 acres of land included in districts of this character, a considerable portion of which is farmed to crops requiring irrigation.

WATER STORAGE ACT

The California water storage district act authorizes the organization of districts whose primary purpose is to provide storage for irrigation. There are at this time two districts with a total area of 280,000 acres operating under this law.

There are 19 districts operating under the county water district act. These districts are organized by petition to county boards of supervisors and are under the jurisdiction of no state agency. Apparently the principal purpose for which most of such districts are formed is to supply domestic water to their residents, and it is estimated that only about 30,000 acres are irrigated under these organizations.

There are several other water conservation acts which were passed to meet special conditions or are of local application, but they have as yet served little or no part in the development of irrigation in California.

Barber—Wet or dry, madam?

Lady—Never mind the politics, just comb my hair.

PATROL OFFICERS' DUTIES COVER RANGE FROM SAVING PURSES TO SAVING LIVES

(Continued from page 8.)

Vierling Kersey, State Superintendent of Public Instruction:

I want to report a splendid piece of cooperation on the part of the State Traffic Department with the adult evening school administration at Fortuna, and will appreciate it if your department will let the State Traffic Department know that we appreciate such splendid cooperation.

We held our opening night program and reception for adult evening school work last night and had sent out approximately 1000 invitations to adults in our school district. The response was wonderful. People came from all parts of the district to register, some traveling as far as twenty miles.

The State Traffic Department, under the able leadership of Inspector M. F. Brown of Eureka, by strange coincidence, set up a light raid at the entrance of town and stopped every car that came in, issuing tickets to those that had faulty lights. I felt that this was a poor reception for those people who were coming to attend our evening school reception and registration, hence I went to Inspector Brown and explained the situation to him. I also requested that they postpone their activities until a later date.

Inspector Brown very considerably assured me that they desired to cooperate with the evening school in every way, and promptly withdrew his force to a different locality or district for the rest of the evening. He further promised to assist us in every way possible at all times. We in turn have pledged 100 per cent cooperation with the State Traffic Department in a program of education and law enforcement.

Escorts Are Praised.

Many letters were received from organizations and communities to which the Highway Patrol had extended assistance either as escorts to caravans or as aids in handling crowds. William E. Metzger, secretary-manager of the San Joaquin Tourist and Travel Association, concludes such a letter with the following paragraph:

I am of the opinion that California State Motor Patrol under your guidance is the finest organization of its kind in the world. The men are intelligent, courteous, efficient and able to meet any emergency with the best of judgment.

INTERNATIONAL—When representatives of 50 or more governments met in the sixth international road congress in Washington, October 6-11, they were seated according to languages, and questions were translated at a central point and transmitted to the delegates through earphones. English, German, French and Spanish were used.

MASSACHUSETTS—State Department of Agriculture has developed a plan whereby tourists will be able to identify roadside stands which are sanitary and which sell quality products. Signs patterned after the New England quality products labels will be issued to stands complying with the state regulations.

Industries and the
Salt Water Barrier



Water Studies in
Sacramento Valley

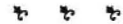
October Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Salinity Investiga-
tion Nears
Completion



Preparing For
New Snow Surveys

INDUSTRIES AND THE SALT WATER BARRIER

During the past month investigations and studies in connection with the salt water barrier have proceeded on the relations of the proposed barrier to the industrial development in the Bay region and to the agricultural development in the Delta and in the marsh land and upland areas contiguous to Suisun and San Pablo bays. A field survey was completed of the upland areas contiguous to Suisun and San Pablo bays, including all marginal lands from the marsh lands up to elevation 150 feet above sea level. This survey included the classification of the lands as regards crops, irrigation development, soil and adaptability and feasibility of irrigation and the necessity and desirability of additional water supply for irrigation. All available data in regard to the reclamation development in the Delta of the Sacramento and San Joaquin rivers have been gathered and are being compiled and analyzed with particular regard to the possible beneficial or detrimental effects of the barrier upon developments within this area. Preliminary studies have been started for the purpose of determining the feasibility and cost of furnishing water for irrigation and industrial uses by means of conduits extending from the Delta region down to the agricultural and industrial areas contiguous to Suisun Bay.

The intensive studies on the relation of the proposed salt water barrier to the industrial development in the upper San Francisco Bay area have been practically completed during the past month. Professor Geo. W. Dowrie, consulting economist from the Stanford Graduate School of Business, will shortly submit his final report to the special Industrial Economics Committee for final review and approval. This committee is composed of Professor W. E. Hotchkiss, dean of the Stanford Graduate School of Business, as chairman; Professor H. S. Grady, dean of the Graduate School of Business of the University of California; Mr. A. D. Schindler, consulting engineer of San Francisco.

This report contains the results of intensive investigations and studies of the economics of plant location in general and as directly applied to the San Francisco Bay region, the importance of water supply as a plant location factor in general and as directly applied to the San Francisco Bay region, the present magnitude and the past and future growth of the industries in the upper bay region, the relation of water costs to the present and future growth of industries in the upper bay region, and finally the possible economic advantages and benefits to the industries which might accrue from the construction of the proposed salt water barrier. The data obtained from the intensive survey of the industrial development have been of invaluable aid in carrying out this economic study on

the relation of industrial development to the proposed barrier. The cooperation and assistance of the industries in furnishing the basic data on the industrial development have largely contributed to the successful prosecution of this particular phase of the salt water barrier investigation. Substantially complete data on all of the industrials in the area affected by the proposed barrier have been obtained. Based upon the records furnished, complete data on the consumption and cost of water used by the industries have been compiled and analyzed. In addition, statistical data showing the past growth and present magnitude of the development have been compiled and analyzed for the purpose of estimating the future trend and growth of the industrial development.

GEOLOGICAL STUDIES

The special geological studies which have been under way by Professor C. F. Tolman, consulting geologist of Stanford University, have been completed and report submitted. These geological studies and report thereon include determinations of the geological formations and location of earthquake faults and all pertinent geological data related to the various sites proposed for the salt water barrier.

SEWAGE INVESTIGATION

The very detailed investigation and intensive study on sewage pollution and industrial wastes and the relation of the proposed salt water barrier thereto have been practically completed by Mr. C. G. Gillespie, chief engineer of the Bureau of Sanitary Engineering of the State Board of Health. The investigation has included the determination of all points and sources of pollution in the entire area affected from Sacramento and Stockton down to Richmond. Special pollution surveys have been made to determine the effect of sewage pollution and industrial wastes of various types on the quality and redeemability of the water. The report is now being prepared.

COOPERATIVE WORK

The cooperative work on the salt water barrier investigation under the direction of Colonel Thomas M. Robins of the U. S. Army Engineers has been proceeding on an intensive scale and substantial progress has been made. The work of the U. S. Army Engineers has involved detailed investigations and studies of the effect of the barrier on movement of silt and water borne debris in the rivers and bays and the effect on tidal action and tidal currents.

SACRAMENTO VALLEY INVESTIGATIONS

Estimates of the full natural and present impaired run-offs of all the minor streams in the Sacramento

Valley have been completed. Preliminary studies have been made for the Kennett reservoir and for the American River units operated to supply prior rights, salinity control and for an imported supply to the San Joaquin Valley. Studies to determine the economic installed capacities of power plants at the major reservoirs and the power output of the plants operated primarily for power have been completed for several of the units. Studies were completed for different methods of operating the upper Sacramento River units in combination with the Trinity River diversion to determine the relative value of each combination. Flood concentrations at five points in the Sacramento Valley have been determined for different sizes and frequencies of floods. Flood frequencies at the gaging stations have been completed for the major streams and studies have been initiated to determine the amount of space required in the major reservoirs to control floods to various magnitudes. Detail cost estimates have been completed for the major reservoirs in the Sacramento Basin and also for the Trinity River diversion, including costs of power plants. Annual costs for operating and maintaining these works have also been estimated. A report on the geology of the Sacramento Valley as related to the ground water storage has been prepared by Mr. Hyde Forbes, engineer-geologist. Measurements of depth to water on wells distributed throughout the Sacramento Valley floor have been continued during the month; 188 wells out of a total of 225 have been measured.

SAN JOAQUIN VALLEY INVESTIGATION

Examination and classification of all the mountain and agricultural land on the east side of the valley and north of the San Joaquin River have been completed. A map delineating the crop classification of 1929 has been completed. This is being used in determining the probable crop adaptability of the lands in the San Joaquin Valley and also in the study of the areas of deficient water supply. Maps of the ground water elevation of the upper San Joaquin Valley for all years of ground water observation, 1921 to 1929, were completed during the month. Maps of lines of equal total lowering of water table for the same period and of equal depth to water table as of October, 1929, were also completed for this area. Studies of the average seasonal inflow required to supply crop needs and maintain the position of the water table were completed for several hydrographic divisions of the upper San Joaquin Valley. Economic studies were completed during the month covering the following subjects:

1. Comparison of the economics of developing storage on the San Joaquin River at the Friant or at the Temperance Flat site.
2. The economics of the development of storage at the Friant site.
3. The economics of the utilization of the waters of the San Joaquin River with storage at Friant and canals diverting water northward to the Madera area and southward to the upper San Joaquin Basin. This study covers both the proposed initial development and the ultimate.
4. Economics of the proposed initial development as it affects the individual landowner in the upper San Joaquin Valley.

Cost estimates have been completed for reservoir development on the Kern River at Isabella and on San Joaquin River at Friant. A final layout with map and profile together with cost estimate has been com-

pleted for the San Joaquin River pump system using the San Joaquin channel to the mouth of the Merced River and thence following high ground on the west side to Mendota.

Preliminary studies completed and costs estimated of the feasibility of utilizing existing and artificial channels to connect the Sacramento River near Hood with the San Joaquin River at the mouth of the Mokelumne for the purpose of delivering Sacramento River water nearer to the center of demand in the Delta, to control salinity and to deliver water for export to the San Joaquin Basin.

OTHER INVESTIGATIONS

MOJAVE RIVER INVESTIGATION

During the month data for the progress report to complete the year's work up to September 30, 1930, were being collected.

It has become apparent that additional gaging stations must be established in order to complete the investigation. The run-off from the mountains is quite definitely established but the amount of water wasted by noneconomic vegetation above the lower rights is not known and the previous conception of the investigation could not be known until a year or two of sufficient high water to run through to the end of the river had occurred. By establishment of three new stations at a total cost of about \$1,300 it is believed that this can be determined in one year's time and report completed.

SOUTH COASTAL BASIN INVESTIGATION

This investigation is handicapped by lack of funds. An engineer was put in the field on October 1st with headquarters at Alhambra. He will get in touch with all those interests now measuring wells and prepare these data for publication. Numerous meetings have been held with various committees to organize the people of the area so that the information would be made available to this office. At the present time the expenditures should be proceeding at the rate of \$4,000 per month while actually expenditures are in the neighborhood of \$500 per month.

VENTURA COUNTY INVESTIGATION

Progress report for the past year is now being mimeographed for distribution to those interested.

ANTELOPE VALLEY INVESTIGATION

A reconnaissance was made of Antelope Valley to determine what could be done toward investigation. On October 14th a meeting was held with Los Angeles Chamber of Commerce which had promoted the investigation, and it was stated that the only work which this office could recommend would be consistent measurement of water levels at wells at a cost of approximately \$400 per year. The amount of water available to the valley is estimated to be between 80,000 and 100,000 acre-feet per year. It was stated that due to the physical situation there was no way by which closer estimate could be made without an unduly large expenditure and that it was felt that consistent measurement of wells would finally answer the same question much more cheaply. The Chamber of Commerce was advised that if funds were made available this year this office would undertake to keep up records on wells.

PIT RIVER (MODOC AND LASSEN COUNTIES)

Routine field work was continued throughout the month; platting of irrigated areas about 80 per cent completed.

SANTA CLARA AND NAPA COUNTY INVESTIGATION

Preparation of a progress report covering the year's work in Santa Clara County to September 1st continued throughout the month. The first season's field work in connection with the Napa County investigation was completed and preparation of a progress report for the year will start at once.

MISCELLANEOUS INVESTIGATIONS

Investigation of a water supply for proposed hospital site in the neighborhood of Camarillo in Ventura County was made. The water supply appears to be sufficient.

HOOVER-YOUNG COMMISSION, LEGISLATIVE WATER COMMITTEE

The ninth meeting of the Legislative Water Committee and Hoover-Young Commission convened at Hotel Oakland, Oakland, on September 22d and 23d. At this hearing, conducted as an executive session, deliberations of the above bodies were devoted to consideration of economic justifications for the development of the state-wide water resources plan. Federal benefits to be derived from these developments were weighed and reviewed. Comparisons were discussed for plans of construction of projects based on federal interest-bearing funds and federal interest-free funds. The tentative form and items of general policy for the composition of a constitutional amendment looking toward adoption of the state-wide water resources construction program were extensively discussed.

The tenth hearing of the fore-named bodies convened in executive session on October 6th and 7th, at Hotel Oakland, with an excellent attendance by members of both bodies. A summary of capital and annual costs for the development of the water resources projects of the great central valley was presented for study and discussion. Alternative programs of financing and construction were offered by members of the Legal Subcommittee of the Federal-State Commission.

SALINITY INVESTIGATION

During the past month a first draft of the report on salinity investigations has been completed. In connection with the report about 70 plates consisting of maps and diagrams and 50 tables summarizing the data and an analysis on the investigations and studies have been prepared. Relations have been established between the variation in advance and retreat of salinity and the basic factors of stream flow and tidal action which affect the same. The studies have resulted in the determination of the amounts of stream flow required to control salinity to various degrees and at various points in the Delta and upper bay region. The results of the investigation will be submitted to a special engineering advisory committee for complete review. Field work has been continued on the maintenance of 40 regular salinity observation stations and numerous automatic tide gage stations in the Bay and Delta regions.

IRRIGATION, WATER STORAGE DISTRICTS

The preparation and assembling of material for the report on irrigation district activities for the year

1929 has been completed and the manuscript transmitted to the State Printer for publication.

Visits were made during the present month to the Montague, Grenada, Big Springs and Scott Valley irrigation districts, located in Siskiyou County, to advise with their officers in connection with the maintenance and operation of these districts.

A hearing was held by the State Engineer at Hanford, on October 14th, in the matter of petitions for the exclusion of 1584 acres of land from the Tulare Lake Basin Water Storage District.

Officials of the Madera Irrigation District, located in Madera County, appeared before the California Bond Certification Commission for the purpose of discussing a proposed change in the plans of the district. This district proposes to proceed with its developments for which a bond issue was voted a number of years ago.

The California Bond Certification Commission approved a bond issue in the amount of \$135,000 for improvements and developments by the El Nido Irrigation District, located in Merced County. This district, recently organized, contains approximately 9000 acres and the purpose of the proposed bond issue is for raising funds for the construction of its irrigation system.

The bond commission also approved an agreement entered into between the Nevada Irrigation District and the Pacific Gas and Electric Company confirming previous agreements made between these parties.

DAMS

The activities of this department have been directed not only to studying and inspecting existing dams, but also much time has been spent on new construction and repairs which will be discussed in detail below.

To date 707 applications for approval of existing dams have been filed; 49 applications for approval of plans for the construction or enlargement of dams, and 66 applications for approval of plans for repair or alteration of dams.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR CONSTRUCTION OR ENLARGEMENT

Dam	Owner	County	Estimated cost
Hawkins	C. N. Hawkins	San Benito	\$3,000
Pine Canyon	City of Pasadena	Los Angeles	6,500,000
Mud Springs	Richard Talbot	Lassen	36,700
Peters Canyon	The Irvine Company	Orange	55,000

Application for approval of plans and specifications for Pine Canyon Dam was filed with the department on September 30 by the city of Pasadena. This is to be a huge concrete gravity structure 265 feet high and containing almost 700,000 cubic yards of concrete.

Because of the importance, magnitude and location of the proposed dam and the many involved technical features, the State Engineer has appointed a consulting board consisting of Chas. P. Berkey, professor of geology, Columbia University, New York City, N. Y.; Geo. D. Louderback, professor of geology, University of California; Ira A. Williams, consulting geologist, Portland, Oregon; J. L. Savage, chief designing engineer, U. S. Bureau of Reclamation, Denver, Colorado; George A. Elliott, consulting engineer, San Francisco; and M. C. Hinderlider, state engineer, Denver, Colorado, to investigate and report upon the safety features of the structure.

These nationally known consultants, possessing unquestioned ability and integrity, are preeminently qualified and widely experienced in their respective professions. They are to complete an intensive examination of the site of the proposed work and com-

prehensively review all technical phases of the proposed dam. The results of their investigation, together with their conclusions, will be embodied in a report to the State Engineer upon the safety features of the dam.

This board consists of the same members who last November reported to the state regarding the proposed Forks dam on the San Gabriel, a few miles above the Pine Canyon site, and are therefore already generally familiar with San Gabriel area.

The Pine Canyon Dam will also be under the jurisdiction of the U. S. Forest Service, and the federal department, through Mr. E. W. Kramer, regional engineer, will cooperate with the state in the investigation.

APPLICATIONS RECEIVED FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR REPAIRS OR ALTERATIONS

Twenty-three such applications have been received during this period in line with the endeavor of the owners and of this department to get all dams in shape for final approval.

PLANS APPROVED FOR CONSTRUCTION

Dam	Owner	County
Whittier Reservoir No. 4	City of Whittier	Los Angeles
Tiger Creek	Pacific Gas and Electric Company	Amador

PLANS APPROVED FOR REPAIRS AND ALTERATIONS

Fourteen applications of this nature were approved by the State Engineer.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

Aside from clearing of second growth timber in the by-pass, only routine maintenance work has been carried on in connection with the flood control project. An average of 25 men have been employed during this period.

FLOOD CONTROL PROJECT MAINTENANCE—BANK PROTECTION

Two tree current retards have been constructed on the left bank of the Sacramento River at Twenty Mile Bend, in cooperation with Reclamation District No. 70, at a cost of \$4,200.

Bank protection work in cooperation with Reclamation District No. 317 has been undertaken on the San Joaquin River side of Andrus Island. The work is approximately one-third complete and consists of rebuilding the levee and facing it with rock rip-rap for a distance of 3500 feet. The dredger *Trojan* and one dragline machine are at work and approximately 6000 tons of rip-rap rock will be placed. The estimated cost is \$23,500.

Approximately 500 tons of rock additional have been deposited on the Brannan Island protection on the Sacramento River opposite Rio Vista, in cooperation with Reclamation District No. 2067.

In cooperation with the Division of Highways and Reclamation District No. 556, bank protection work is being installed on the left bank of the Sacramento River on Andrus Island, two miles below Ryde. The estimated cost of this work is \$2,300.

SACRAMENTO FLOOD CONTROL PROJECT

An average of 70 men have been engaged during the period in clearing in the Sutter-Butte Slough and Tisdale by-passes and two camps have been in opera-

tion. Clearing work on the Feather River bottom near Marysville under five contracts is 97 per cent complete, three of the contracts being entirely finished. Considerable detail work has been done in connection with the flood control construction program for the current fiscal year and various surveys have been made in this connection. The deputy in charge of flood control and reclamation attended two meetings of the Reclamation Board and one meeting of the construction committee of the Flood Control Association.

SANTA MARIA RIVER

The work of clearing the channel of the Santa Maria River near Guadalupe was commenced on September 22, 1930, and has continued with a force of 50 men under D. W. Roberts. This work is in cooperation with the counties of Santa Barbara and San Luis Obispo.

RUSSIAN RIVER JETTY

The funds available for the construction of the jetty at the mouth of the Russian River have been exhausted and the work was discontinued on October 11. The south jetty is well toward completion and lacks only about 10,000 tons of rock to finish. The condition of the jetty is fairly good and it will withstand ordinary winter storms. The channel has remained open.

NAVARRO RIVER JETTY

The rock jetty at the mouth of the Navarro River, constructed for the Division of Fish and Game, was completed on October 1, 1930, under contract by Christie and Allen at a cost of \$5,250. The bar was opened after the completion of the jetty.

SALINAS RIVER

It is expected to have the work of opening the channel of the Salinas River into Elkhorn Slough completed by October 30. The barge for the transportation of equipment has been completed, and it is expected to move the machine in on October 20.

During the period since September 15, 1930, an average of 145 men have been employed on the above work exclusive of contractor's employees.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

During the month of September twenty-five applications to appropriate water were received, sixteen were canceled and twenty-five were approved. Seven permits were revoked and two licenses were issued.

Among the applications received of more than ordinary interest are those by C. M. Salyer to appropriate for mining purposes from South Fork of Trinity River in Trinity County at an estimated cost of \$91,000, the application of Western Pacific Railroad Company to appropriate from Potato Slough, a tributary of South Fork of Mokelumne River, in San Joaquin County, for industrial purposes, at an estimated cost of \$11,500, and the application of El Nido Irrigation District to appropriate from Deadman and Dutchman creeks, tributaries of San Joaquin River, in Merced County, for irrigation purposes, at an estimated cost of \$135,000.

Permits of more than ordinary interest issued during the month are those approving the applications of C. Fred Holmes et al., to appropriate from East Dredger Cut of Sutter By-pass, in Sutter County, for the irrigation of 1897 acres at an estimated cost of \$15,000 and the application of Banta Carbona Irrigation District to appropriate from San Joaquin

River, in San Joaquin County, for irrigation purposes at an estimated cost of \$334,000.

ADJUDICATIONS

Shasta River (Siskiyou County). Case pending in the superior court of Siskiyou County.

Whitewater River (San Bernardino and Riverside Counties). Case pending in the superior court of Riverside County awaiting development 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 toward settlement of one of the important issues.

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

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

Butte Creek (Siskiyou County). Case 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). Negotiations relative to a consent judgment being carried on.

Mill Creek (Modoc County). Administration of the tentative schedule of allotments which was authorized for the 1930 season was completed October 1st.

Deep Creek (Modoc County). The field investigation of water supply and use of water was completed October 1st.

Franklin Creek (Modoc County). The field investigation of water supply and use of water was continued throughout the month. A survey of the lands irrigated from the stream was completed during the month.

WATER DISTRIBUTION

Water master service on *Little Shasta River and Lower Shasta River (Siskiyou County)*, *North Cow, Oak Run and Clover creeks (Shasta County)*, *Davis, Emerson, Mill, Owl and Soldier creeks (Modoc County)*, and *West Fork of Curson River (Alpine County)*, was discontinued for the season October 1st. Water master service on *Hat and Burney creeks, both in Shasta County*, was discontinued for the season on October 10th.

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. Considerable work was done by the water users, under the supervision of the resident engineer, in the repair of the dams along the river in order to increase the efficiency of the water distribution next season.

CALIFORNIA COOPERATIVE SNOW SURVEYS

The work in the past month has been almost entirely in the field. Trips have been made to make the necessary arrangements for the surveys in the coming season, such as the proper stocking of shelter cabins, distribution of equipment and discussion of plans with cooperating agencies and the personnel to be used on the surveys.

On a trip through Yosemite Park, all snow courses were marked with the new State-U. S. Department of the Interior signs and one course was relocated.

At Fresno, arrangements were made with the San Joaquin Light and Power Corporation for the North Kings surveys.

At Hume, plans were completed with the city of Los Angeles for the Middle and South Kings surveys. New snow courses at Bullfrog Lake and Copper Creek Summit are contemplated for the 1931 surveys.

At General Grant Park and Hanford, the cooperation with the General Grant Park and Tulare Lake Water Storage District for South Kings surveys was worked out.

At Sequoia National Park, new snow courses were located at Panther and Hockett in the Kaweah Basin and at Quinn Ranger Station Meadow in the Kern Basin. These courses and the one at Giant Forest will be surveyed monthly, January to May, through the cooperation with the Sequoia National Park.

In Lassen Volcanic National Park, arrangements were completed for the construction and stocking of shelter cabins at Lake Helen and Supan Springs, and certain of the snow courses were marked with pipe standards.

The relocated Haskins Flat course near Bucks Reservoir was signed.

In the Stanislaus Basin new snow courses to be surveyed through cooperation with the Pacific Gas and Electric Company were located and marked at Soda Creek Flat, Lower Relief Valley and Eagle Meadows.

In the Carson and Mokelumne basins, arrangements were made for stocking the regular shelter cabins.

In the San Joaquin Basin, the Florence Lake course was relocated.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Regular field and office work comprising measurements of all diversions, stream flow, and return flow throughout the Sacramento-San Joaquin territory, has continued. The field work has been devoted chiefly to the annual census of irrigated crops and areas under all diversions measured throughout the Delta region.

Field and office work has been done to determine the segregation of San Joaquin return water as to districts and certain stretches of the river.

Salinity investigations have been continued with the maintenance of sampling at forty-six stations in the Bay and Delta areas. Six regular tide gage stations have been maintained and recently, upon the withdrawal of the army engineers from field work, the maintenance of the Benicia, Antioch and Collinsville tide gages has been taken over.

The following are comparative data for 1929 and 1930:

Station	Salinity in parts of Chlorine per 100,000	
	October 2, 1930	October 2, 1929
Bullhead Point	1,090	1,230
O. & A. Ferry	400	560
Collinsville	250	410
Antioch	225	365
Jersey	48	170
Emmaton	--	110
Webb Pump	14	40
Rio Vista	2	3
Isleton	2	2

Station	Discharge in second-feet	
	October 8, 1930	October 8, 1929
Sacramento River at Sacramento	6,850	5,450
San Joaquin River near Vernalis	1,720	1,490
Combined flow to delta	8,570	6,940

Progress on State Highway System

MAJOR PROJECTS COMPLETED, UNDER WAY AND ADVERTISED AS REPORTED
TO GOVERNOR'S COUNCIL ON OCTOBER 29th

C. H. PURCELL, Chief of Division of Highways.

The following statement summarizes the work of the Division of Highways since September 23d, when the September report was made to the Governor's Council:

Work placed under contract.....	\$962,900
Contracts pending and projects advertised.....	1,052,100
Work in process, anticipated to be advertised during the coming month.....	1,781,000
Total	\$3,796,000

CONTRACTS COMPLETED

During the same period contracts on construction of state highways have been completed and work accepted on a number of projects, including the following:

SAN DIEGO-EL CENTRO LATERAL

Three miles of Portland cement concrete pavement, 20 feet wide, have been placed on the San Diego-El Centro lateral in Imperial County from the Myers Creek bridge to three miles west of Coyote Wells; the cost was \$131,300. This improvement on the route connecting the Imperial Valley with the coast at San Diego was placed on the roadbed which was built following the destruction of the old paved road by the flood of December, 1923. The new highway is well up on the mountain side and will be safe from damage by future storms.

DESERT GAP BRIDGED

The extension of modern highway construction on one of the most traveled transcontinental roads has bridged another gap across the desert in San Bernardino County. This project covers nearly twenty miles of the interstate highway which enters southern California at Needles and via San Bernardino. The work extended from two miles west of Argos to one and one-half miles west of Siberia and consisted of grading and placing an oil treated crushed rock surface, twenty feet wide. The usual method of desert construction was used, with protection to the roadbed against damage by cloudbursts in the form of an adequate system of ditches and dikes which parallel the highway and carry flood waters into large cross channels. This new desert highway carries the improvement, which was recently completed, from Daggett to Siberia and there connects with the 51 miles now under construction as far as Essex. The cost of the twenty miles just completed amounted to \$400,000.

COAST ROUTE BETTERMENT

The paving of over eleven miles of the important Coast Route connecting Los Angeles and San Francisco has been completed, comprising the four miles between Zaca and Wignore in Santa Barbara County and from the Santa Maria River north to Los Berros Creek in San Luis Obispo. On these two sectors the

roadbed was widened and straightened and the old fifteen-foot concrete pavement has been replaced with a modern reinforced concrete slab twenty feet wide. The total cost of these two projects was \$397,500, and their improvement has brought to modern standards of highway construction two of the few remaining old stretches of this heavily traveled artery.

ANGELS CAMP-BIG TREES HIGHWAY

In Calaveras County, 15.5 miles of the mountain highway from Angels Camp to Markleville has had the old base thickened and widened to a uniform width of 15 feet from Murphy's to Big Trees and is now being given a bituminous surface treatment by state forces. The cost of reconstructing the base and stockpiling the screenings for the surface treatment amounted to \$18,200. When completed this improvement will give a satisfactory mountain road from Angels Camp to Big Trees, making a safe and smooth highway to this popular resort for both summer vacationists and those wishing to enjoy winter sports.

REDWOOD HIGHWAY PROJECTS

The continued improvement of the Redwood Highway, which extends from San Francisco through the beautiful redwood groves along the coast to the Oregon line, is noted by the completion of five projects at various points along its route.

In Marin County the two miles from San Rafael to Gallinas Creek was constructed on a new alignment around the hills north of San Rafael. The new road is surfaced with bituminous macadam over the fills and with Portland cement concrete pavement on the portions which are not subject to settlement. An overhead grade separation across the tracks of the Northwestern Pacific Railroad was constructed at Forbes Station. This new routing eliminated some exceptionally bad alignment of adverse grades and blind curves and shortened the road between these two points by 1600 feet.

In Humboldt County two needed improvements have been made between Loleta and Beatrice. An underpass beneath the tracks of the Northwestern Pacific Railroad was constructed at Loleta and the five miles from Loleta to two miles north of Beatrice was reconstructed to present day standards of alignment and grade with an adequate screened gravel surfacing. An overhead crossing is now under construction across the railroad at the north end of this project.

From Garberville to Bluff Creek, a mile of poor alignment along the Eel River has been replaced by a modern highway with easy grades and large radius curves surfaced with twenty-two feet of untreated crushed rock.

A substantial base for future surfacing has been placed from Smith River to Patricks Creek in Del Norte County on that portion of the Redwood Highway between Crescent City and Grants Pass, Oregon. Fifteen miles of untreated crushed rock, from four

inches to six inches in thickness and from eighteen feet to twenty feet wide, comprised this improvement.

The total expenditures of these five projects on this coastal route amounted to \$338,500.

RED BLUFF-SUSANVILLE LATERAL

The completion of the last unimproved gap on the lateral between Red Bluff and Susanville is noted by the construction of the four and one-half miles between Goodrich and Coppervale in Lassen County. This work consisted of constructing a graded roadbed and placing crushed rock surfacing twenty feet wide. Traffic on this section is largely local travel between Westwood and Susanville, but it is now expected that through traffic from Red Bluff to Susanville will materially increase due to the improvement over the entire length of the lateral. The cost of this last improvement was \$77,000.

PROJECTS ON WHICH BIDS WERE OPENED

Important projects for which bids were opened during the past month include the following:

GRADE SEPARATIONS

A project for placing a forty-foot Portland cement concrete pavement through the grade separation which is now being built by the Pacific Electric Railway at its crossing of the Foothill Boulevard near Malaga street, eight miles west of San Bernardino. The construction of this subway will be a much needed safety factor on this heavily traveled road, as the old grade crossing has been the scene of many accidents, some of which have resulted in fatalities. The cost of the pavement at this structure will be \$36,800.

CASTAIC CREEK CROSSING

On the Los Angeles-Sacramento highway, just south of the Ridge Route, the road is to be reconstructed on a new alignment at its crossing of Castaic Creek. A reinforced concrete girder bridge is now under construction on the new location replacing the old existing bridge which was built on an alignment unfitted for present day high speed traffic. The new routing will have a roadbed of 36 and 40 feet wide and will be paved with 20 feet of Portland cement concrete. Costing \$44,900 this project is another improvement of this artery which runs through the heart of the state.

COAST ROUTE WORK

The extensive improvement of the Coast Boulevard between Long Beach and Newport Beach was given further impetus when bids were opened for the construction of a 326-foot timber bridge across Alamitos Bay on the new alignment of this route between Anaheim street in Long Beach and Seal Beach. The construction of the roadway and a bridge across the San Gabriel River on this new location is now under way. The cost of the Alamitos Bay bridge will be \$53,100.

SANTA MARIA RIVER BY-PASS

To be constructed at a cost of \$25,000 a low level by-pass road across the old channel of the Santa Maria River and overflow channel of the Cuyama River is necessitated by the recent failure of one span of the old county bridge across the Santa Maria River in Santa Barbara County about one-half mile north of Santa Maria. The by-pass, while consisting of a twenty-foot Portland cement concrete pavement on a standard 36-foot roadbed, is only of a temporary nature and the permanent improvement of this sector

of the important Coast Route will be carried out in the near future.

BAY SHORE PROJECTS

The steady progress of construction on the Bay Shore Highway is evidenced by the opening of bids on two projects and the advertising of a third. The recently graded roadbed constructed across low marsh lands between San Mateo and Redwood City is to have a bituminous treated surface 42 feet wide, placed on the heavy fill and to serve until final settlement of the embankment has taken place, at which time a four-lane Portland cement concrete pavement will be laid. The cost of surfacing this 7.3 miles will be \$134,900. At the southerly end of this project a four-span reinforced concrete girder bridge 127 feet long, with a 76-foot roadway and two twelve-foot sidewalks, is to be constructed across Redwood Slough at an estimated cost of \$43,000. This project was advertised for bids on October 1, 1930. The second project for which bids were opened was for the placing of a 40-foot Portland cement concrete pavement in the city of South San Francisco, and will cost \$97,500. The work will be the final stage of construction on the section of the Bay Shore Highway from the northerly city limits of South San Francisco to the grade separation under the tracks of the Southern Pacific Railroad. The paving on the five miles south of the subway is now under way.

BRIDGE WIDENING WORK

As a factor for greater adequacy and added safety on the heavily traveled artery between the bay region and Sacramento is the widening of five concrete bridges between Vacaville and Dixon in Solano County. The existing bridges were built some 15 to 18 years ago by the county, before present day high speeds had influenced highway construction. The improvement will bring the bridges from 18 or 20 feet in width to 28 feet of clear roadway, at a cost of \$12,000.

LINCOLN HIGHWAY ALIGNMENT

On the Lincoln Highway, just west of Placerville, is an improvement of far-reaching interest as the realignment of this portion of the Sacramento-Placerville lateral has long been a necessity. To cost \$97,600, the project calls for the placing of 22 feet of untreated crushed gravel or stone surfacing on a standard 36-foot graded roadbed. The new alignment is between Clark's Corners and Placerville, a distance of nearly two miles, and will eliminate the existing hairpin turns and materially improve the grade on this westerly approach to "Old Hangtown." The project includes the construction of a bridge across Hangtown Creek.

PACIFIC HIGHWAY CONSTRUCTION

In Colusa County the second stage of the ultimate improvement of the West Side Pacific Highway is to be constructed on the eight miles between Williams and Maxwell. The work will consist of placing a gravel base 33 to 39.5 feet wide over the recently graded roadbed which was constructed to the west of the existing pavement. The present improvement, to cost \$100,700, is preparatory to placing the new pavement, which will be the third and final stage of the highway reconstruction between these towns.

PROJECTS ADVERTISED

Among the more important projects advertised during the past four weeks are the following:

DESERT HIGHWAY WORK

The continued improvement of the desert lateral from El Centro to San Bernardino will be pushed forward by the reconstruction of that portion of this route from the Arroyo Salado to the northerly boundary of Imperial County. The new road will be built to a higher grade than the existing one, so as to give proper drainage and an adequate system of side ditches is to be constructed to protect the roadbed from damage by the severe desert storms. An asphalt concrete pavement 20 feet wide will be placed on a standard 36-foot roadbed section. The high volume of traffic, including much produce trucking, using this route between the Imperial Valley and the metropolitan area surrounding Los Angeles, necessitates the highest type of highway and improvement of the route to modern standards is being made as rapidly as is possible.

MANHATTAN BEACH BRIDGE

An improvement on the Coast Boulevard as it passes through Manhattan Beach, in Los Angeles County, will be the construction of a reinforced concrete girder bridge 135 feet long, and 60 feet wide with two five-foot sidewalks over the tracks of the Atchison, Topeka and Santa Fe Railroad. This overhead structure is being built in conjunction with the grading and paving of this route through Manhattan Beach, which is now in progress under a contract let by the city of Manhattan Beach.

CHOLAME LATERAL IMPROVEMENT

At the crossing of the Cholame Pass lateral with the tracks of the Atchison, Topeka and Santa Fe Railroad at Wasco, in Kern County, the railroad is now constructing a concrete and steel grade separation and the state has now advertised for bids on the grading and paving with Portland cement concrete the highway through the underpass. This construction is a unit in the improvement of this lateral, which connects the coast route at Paso Robles with the valley route at Famoso, just to the north of Bakersfield.

MARIN REALIGNMENT

Three miles of the Redwood Highway are to be constructed on new alignment between Alto and Waldo, in Marin County. This project is the southerly portion of a new location on this popular route from San Rafael to Sausalito, and will materially shorten the distance between these two cities as well as eliminate the difficult Corte Madera grade. The present improvement will consist of constructing a graded roadbed 46 feet and 56 feet wide and placing a bituminous macadam pavement 30 and 40 feet wide. The new routing crosses the tracks of the Northwestern Pacific Railroad and an arm of Richardson's Bay. This crossing will be effected by the construction of a bridge, which will be advertised for bids in the near future.

FEATHER LATERAL BRIDGE

A project of difficult proportions will be the construction of a steel cantilever bridge across the deep gorge of the beautiful canyon of the North Fork of the Feather River at Pulga in Butte County. The erection of this structure is to be accomplished by two contracts, one comprising the placing of the reinforced concrete abutments and piers and the other entailing the erection of the steel cantilever and anchor arm superstructure. Advertisements for bids on the substructure were published October 22, and the superstructure will be advertised in a week or two. This project is located on the Oroville to Quincy lateral, which is being constructed on a new align-

ment. The grading of the adjoining roadway to the south of the bridge and along the precipitous slopes of the canyon side is now under way. The bridge will swing high above the river, crossing over the bridge of the Western Pacific Railroad and carrying the highway to the solid rock wall on the east side of the canyon where future road work will lead the route up the river.

OCTOBER REPORT OF DIVISION OF MOTOR VEHICLES

FRANK SNOOK, Chief

MOTOR VEHICLE REGISTRATION SHOWS INCREASE

As of October 1, the Division has registered the following number of vehicles as to classification:

Automobiles	1,807,807
Solid trucks	15,299
Pneumatic trucks	79,778
Motorcycles	8,973
Solid trailers	9,321
Pneumatic trailers	36,957
Transfers	435,375

In every classification excepting solid tire truck equipment an increase is noted over 1929. The total fees collected is \$9,320,590.78.

As of October 1, the Division has issued 66,186 nonresident permits. We have also registered 36,656 exempted automobiles, motorcycles and trailers; 139,664 chauffeur licenses have been issued as of October 1.

HIGHWAY PATROL ACTIVITIES

During the past month the men patrolling the highways covered a total mileage of 672,402 miles.

During September, 13,860 stops were made in light tests and 6094 persons arrested.

The Bureau of Brakes examined and submitted for approval during the last month 100 applications for brake adjusting stations and 210 adjusters. At the present time the Division feels that a sufficient number of stations have been authorized to handle the cars cited in our enforcement program and a number of applicants have been advised to this effect. Practically all arrangements have been completed for the enforcement of the brake laws in Los Angeles and should be put in effect in a few weeks. The Los Angeles Police Department has expressed a desire to operate along the lines of the California Highway Patrol in the matter of retesting and allowing a certain period of time for a courtesy campaign before imposing fines. To date there are 1177 authorized brake adjusting stations and 2635 adjusters.

During the month of September, 42,444 applications were received for operators' licenses. Of this number 34,597 were issued. Some were temporarily rejected. One applicant was permanently rejected as incompetent.

PA'ROL SCHOOL NOW AT MATHER FIELD

On August 4, the California Highway Patrol school moved to new quarters at Mather Field. The first class at Mather Field completed their course of instructions October 1, and on October 4, the second class reported and completed their instructions October 17. We have found the new quarters ideal in almost every way. The health of the men in the last two classes has been excellent, which we attribute in a large measure to the location of the school.

HIGHWAY BIDS AND AWARDS

For Month of October

SAN MATEO COUNTY—Through South San Francisco about 0.9 of a mile to be graded and paved with Portland cement concrete. Dist. IV, Rt. 68, Sec. A. W. A. Dantanville, Salinas, \$104,365; Hanrahan Co., San Francisco, \$89,487; N. M. Ball, Porterville, \$96,600. Contract awarded to Basich Bros. Const. Co., Torrance, \$89,162.50.

SANTA BARBARA COUNTY—About $\frac{1}{2}$ mile north of Santa Maria, 0.6 of a mile to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. A. Macco Const. Co., Clearwater, \$33,764; Santa Maria Const. Co., Santa Maria, \$26,227. Contract awarded to Cornwall Const. Co., Santa Barbara, \$22,362.

SAN BERNARDINO COUNTY—At Malaga Street, about 0.3 of a mile to be paved with Portland cement concrete. Dist. VIII, Rt. 9, Sec. A. Matich Bros., Elsinore, \$34,523; F. W. Teschke, Los Angeles, \$33,319; George Gardner & Sons, Redlands, \$33,362. Contract awarded to Martin Green, San Bernardino, \$32,389.70.

LOS ANGELES COUNTY—Bridge across Almitos Bay near Long Beach. Fifteen 19-ft. timber spans with concrete deck and one 41-ft. 4-inch steel beam removable span. Dist. VII, Rt. 60, Sec. F. J. F. Knapp, Oakland, \$51,945; Oberg Brothers, Los Angeles, \$58,726; Gist & Bell, Arcadia, \$51,799; R. R. Bishop, Long Beach, \$54,682; Merritt, Chapman & Scott, San Pedro, \$55,190. Contract awarded to Carpenter Bros., Inc., Beverly Hills, \$50,545.40.

COLUSA COUNTY—Between Bear Creek and 8 miles west of Williams, construction of new property fence. Dist. III, Rt. 15, Sec. D. A. Mitchell, Sacramento, \$11,499; California Wire Cloth Co., Oakland, \$12,044; B. C. Burnett, Turlock, \$10,970; Standard Fence Co., Oakland, \$11,997; Anchor Post Fence Co., San Francisco, \$8,447. Contract awarded to G. E. McDaniel, Marysville, \$7,843.

LOS ANGELES COUNTY—At Castaic Creek, about 1 mile to be graded and paved with Portland cement concrete. Dist. VII, Rt. 4, Sec. A. McCray Co., Los Angeles, \$41,916; Kovacevich & Price, Inc., South Gate, \$43,421; Gibbons & Reed Co., Burbank, \$45,724; Southwest Paving Co., Los Angeles, \$50,450; Griffith Company, Los Angeles, \$45,130. Contract awarded to F. W. Teschke, Hollywood, \$39,544.

SAN MATEO COUNTY—Between San Mateo and Redwood City, 7.3 miles to be surfaced with bituminous treated crusher run base. Dist. IV, Rt. 68, Sec. C. Healy-Tibbits Const. Co., \$181,639; Fred W. Nighbert, Bakersfield, \$209,792; Clyde W. Wood, Stockton, \$130,530; Peninsula Paving Co., San Francisco, \$151,970; Granite Const. Co., Watsonville, \$179,615; V. R. Dennis Const. Co., \$163,328; W. A. Dontanville, Salinas, Cal., \$181,389; Basich Brothers Const. Co., Torrance, \$143,169; N. M. Ball, Porterville, \$142,337; C. Mankel, Sacramento, \$173,215; Jack Casson, Hayward, \$163,189; Hemstreet & Bell, Marysville, \$151,691; M. J. Bevanda, Stockton, \$144,421. Contract awarded to Fredrickson & Watson, Oakland, \$120,819.75.

DEL NORTE COUNTY—Construction of Maintenance Yard Building at Idlewild, about 9 miles south of Oregon line. Dist. I, Rt. 1, Sec. E. Mercer Fraser Co., Eureka, \$16,700. Contract awarded to Oliver S. Almlie, Crescent City, \$13,868.

HUMBOLDT COUNTY—At High Rock Hill on the Redwood Highway, 0.4 of a mile to be graded and surfaced with untreated gravel. Dist. I, Rt. 1, Sec. D. I. V. Galbraith, Petaluma, \$21,759; Hemstreet & Bell, Marysville, \$16,289; Engelhart Paving Const. Co., Eureka, \$16,617. Contract awarded to Chigris & Sutsos, San Francisco, \$15,020.20.

HUMBOLDT COUNTY—Construction of Maintenance Yard buildings at Garberville. Dist. I, Rt. 1, Sec. A. Smith Bros. Co., Eureka, \$12,237. J. R. Evans, Garberville, \$14,600; Oliver S. Almlie, San Francisco, Louis Halvorsen, Santa Rosa, \$11,841; Mercer-Fraser Co., Eureka, \$13,750. Contract awarded to McCarthy & Johanns, San Francisco, \$10,648.

PLACER COUNTY—Truck shed 80' x 30' and gas and oil house at Roseville Maintenance Station. Dist. III, Rt. 17, Sec. A. W. E. Truesdale, Sacramento, \$4,669; C. J. Hopkinson, Sacramento, \$4,697; Campbell Construction Co., Sacramento, \$4,168; G. E. McDaniel, Marysville, \$5,932; Wilke & Tropper, Roseville, \$4,794; Henry A. Dewing, Walnut Grove, \$5,000. Contract awarded to Yoho & Daughner, Sacramento, \$3,900.

SOLANO COUNTY—Widening to 28 feet 5 existing bridges between Vacaville and Dixon. Dist. X, Rt. 7, Sec. D. Ralph Hunter, Sacramento, \$18,713; P. F. Bender, North Sacramento, \$12,614. Contract awarded to George J. Ulrich, Modesto, \$11,462.95.

IMPERIAL COUNTY—Between Arroyo Salado and north county boundary, 13.1 miles to be graded and paved with asphalt concrete. Dist. VIII, Rt. 26, Sec. DE. Central Cal. Road Co., Los Angeles, \$583,454; V. R. Dennis Const. Co., San Diego, \$544,473; H. W. Rohl Co., Los Angeles, \$549,411; Basich Brothers Const. Co., Torrance, \$575,571; Hanrahan Co., San Francisco, \$499,584; Peninsula Paving Co., San Francisco, \$534,971; George R. Curtis Paving Co., Los Angeles, \$597,795; Gibbons & Reed Co., Burbank, \$549,682; Chas. V. Heuser, Glendale, \$571,072; Clark & Henery Const. Co., San Francisco, \$532,485; Allied Contracting Co., Ins., Omaha, Neb., \$670,749; New Mexico Const. Co., Inc., Albuquerque, N. M., \$552,207; Griffith Co., Los Angeles, \$544,400; Geo. H. Oswald, Los Angeles, \$551,415; Southwest Paving Co., Los Angeles, \$521,596. Contract awarded to R. E. Hazard Contracting Co., San Diego for \$489,125.

HUMBOLDT COUNTY—Removing and replacing timber lift span of the bridge across Eureka Slough at Eureka. Dist. I, Rt. 1, Sec. GH. Fred Mauer & Son, Eureka, \$5,393; Henry Padgett, Fields Landing, \$4,870; Mercer-Fraser, Eureka, \$6,134; Contract awarded to Smith Bros., Eureka, \$4,247.24.

SANTA BARBARA COUNTY—Timber bridge to replace collapsed span across the Santa Maria River. Dist. V, Rt. 2, Sec. A. Santa Maria Const. Co., \$5,432; San Atlas Const. Co., San Luis Obispo, \$5,683; Macco Const. Co., Clearwater, \$6,100; Greene Const. Co., Los Angeles, \$6,236; Silveria & Robbins, Ventura, \$6,293; Cornwall Construction Co., Santa Barbara, \$6,368; Theo. M. Maino, San Luis Obispo Co., \$6,906. Contract awarded to William Lane, Paso Robles, \$4,998.60.

The officer had laid violent hands on the drunk who stood on the corner. Finally the drunk got angry.

"Shay," he said, "I've a good notion to punch you again."

"Again?" asked the cop. "Why, you haven't done it the first time."

"Well," replied the drunk, "I had the same notion before."—Kreolite News.

DIVISION OF ARCHITECTURE

Awards for Month of October

CALIFORNIA STATE BUILDING, Los Angeles: Contracts for general work awarded to Weymough Crowell Co., Los Angeles, \$695,800; plumbing work to Pacific Pipe and Supply Co., Los Angeles, \$47,673; ventilating work to J. Herman Co., Los Angeles, \$16,850; structural steel to Consolidated Steel Corp., Los Angeles, \$128,775; heating work to Lohman Brothers, Los Angeles, \$33,383; electrical work to H. H. Walker, Los Angeles, \$48,894; granite work to McGilvray Raymond Corp., Los Angeles, \$65,985; elevators to Consolidated Steel Corp., Los Angeles, \$47,900.

HUMBOLDT STATE TEACHERS COLLEGE, Arcata: Contract for putting in a 6-inch sewer main from Gymnasium Building to connect with city sewer system, awarded to A. Erizard, Inc., of Arcata, \$2,736.

ALMANOR FISH HATCHERY, Chester: Contract for buildings to Red River Lumber Company of Westwood, \$14,618.

STATE NARCOTIC HOSPITAL, Spadra: Contract for general work on Ward Buildings Nos. 1 and 2, Receiving Ward Building, and Auditorium Building, to John Strona of Chino, \$38,990; contract for plumbing, heating and ventilating work to Thomas Haverly Co. of Los Angeles, \$9,840; contract for electrical work to R. R. Jones Electric Co., South Pasadena, \$1,300.

DAM APPLICATIONS, AND APPROVALS

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 October, 1930.

SIERRA COUNTY—Smith Lake Dam No. 287. Mrs. J. C. Knickram, Blairsden, owner; rockfill, 4 feet above streambed with a storage capacity of 100 acre-feet, situated on Smith Creek tributary to Feather River, in Sec. 30, T. 22 N., R. 12 E., M. D. B. and M. for storage purposes, for domestic and irrigation use.

NEVADA COUNTY—Island Lake Dam No. 61512. Nevada Irrigation District, Grass Valley, owner; rock and earth, 11½ feet above streambed with a storage capacity of 330 acre-feet, situated on Canyon Creek tributary to South Yuba River in Sec. 27, T. 18 N., R. 12 E., M. D. B. and M., for storage purposes, for all uses.

NEVADA COUNTY—Middle Lake Dam No. 61-13. Nevada Irrigation District, Grass Valley, owner; rock and earthfill, 10 feet above streambed with a storage capacity of 72 acre-feet, situated on South Fork Canyon Creek tributary to S. Yuba River, in Sec. 23, T. 18 N., R. 12 E., M. D. B. and M., for storage purposes, for all uses.

NEVADA COUNTY—Crooked Lake Dam No. 61-14. Nevada Irrigation District, Grass Valley, owner; rock, 11 feet above streambed with a storage capacity of 11 acre-feet situated on South Fork Canyon Creek tributary to South Yuba River in Sec. 23, T. 18 N., R. 12 E., M. D. B. and M., for storage purposes, for all uses.

LASSEN COUNTY—Diversion Dam No. 237-5. Red River Lumber Co., Westwood, owner; timber and earth dam, 12 feet above streambed with a storage capacity of 20 acre-feet, situated on Hamilton Branch tributary to North Fork Feather River in Sec. 14, T. 28 N., R. 8 E., M. D. B. and M., for diversion purposes, for power use.

SAN MATEO COUNTY—Dennis Martin Creek Dam No. 610. A. Schilling, Woodside, owner; earth dam, 20 feet above streambed with a storage capacity of 9.95 acre-feet, situated on Dennis Martin Creek tributary

to Searsville Lake, located in Rancho Canada de Raymundo, for storage purposes, for recreation use.

PLUMAS COUNTY—Long Lake Dam No. 286. Ed Burke, Blairsden, owner; rock dam, 5½ feet above streambed with a storage capacity of 1200 acre-feet, situated on Frazier Creek tributary to Feather River in Sec. 1, T. 21 N., R. 11 E., M. D. B. and M., for storage purposes, for irrigation and power use.

SIERRA COUNTY—Gold Lake Dam No. 286-2. Ed Burke, Blairsden owner; rock dam, 4 feet above streambed with a storage capacity of 1200 acre-feet, situated on Frazier Creek tributary to Feather River in Sec. 16, T. 21 N., R. 12 E., M. D. B. and M., for storage purposes for irrigation use.

PLACER COUNTY—Quail Lake Dam No. 326. D. H. Chambers, Chambers Lodge, owner; rockfill dam, 6 feet above streambed with a storage capacity of 17 acre-feet, situated on Quail Lake tributary to Lake Tahoe in Sec. 12, T. 14 N., R. 16 E., M. D. B. and M., for storage purposes for domestic, irrigation and power use.

MODOC COUNTY—Duke Reservoir No. 163. Royal E. Williams, Likely, owner; earth dam, 10 feet above streambed with a storage capacity of 20 acre-feet, situated on drainage tributary to Pit River in Sec. 9, T. 39 N., R. 13 E., M. D. B. and M., for storage purposes, for irrigation and stock use.

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

LASSEN COUNTY—Mud Springs Dam No. 240. Richard Talbot, Portland, Oregon, owner; earth dam, 21½ feet above streambed with a storage capacity of 13,000 acre-feet, situated on Deep Cut Creek tributary to Secret Creek in Sec. 35, T. 31 N., R. 16 E., M. D. B. and M., for storage and diversion purposes for irrigation use. Estimated cost, \$36,700; fees paid \$367.

ORANGE COUNTY—Peters Canyon Dam No. 793-2. Irvine Company, Tustin, owner; earth dam, 41 feet above streambed with a storage capacity of 1090 acre-feet, situated on Peters Canyon in Block 15, Irvine's Subdivision, for storage purposes, for irrigation use. Estimated cost, \$55,000; fees paid, \$550.

AMADOR AND CALAVERAS COUNTIES—Tiger Creek Afterbay Dam No. 97-105. Pacific Gas and Electric Company, San Francisco, owner; arch dam, 85 feet above streambed with a storage capacity of 3800 acre-feet, situated on North Fork tributary to Mokelumne River in Sec. 23, T. 7 N., R. 13 E., M. D. B. and M., for diversion purposes for power use. Estimated cost \$1,200; fees paid \$20.

SHASTA COUNTY—Digger Dam No. 222. G. L. Childs and A. P. Waller, Manton, owners; earth dam, 22 feet above streambed with a storage capacity of 34 acre-feet, situated on a dry ravine tributary to Digger Creek in Sec. 18, T. 30 N., R. 1 E., M. D. B. and M., for storage purposes, for recreation use. Estimated cost, \$2,517; fees paid, \$25.17.

SAN MATEO COUNTY—Dennis Martin No. 2 Dam No. 610-2. A. Schilling, Woodside, owner; earth dam, 16 feet above streambed with a storage capacity of 8.54 acre-feet, situated on Dennis Martin Creek tributary to Searsville Lake in Rancho Canada de Raymundo, for storage purposes, for recreation use. Estimated cost \$1,200; fees paid \$20.

SISKIYOU COUNTY—Kathriner Dam No. 186. Frank Kathriner, Weed, owner; hydraulic fill dam, 25.9 feet above streambed with a storage capacity of 322 acre-feet, situated on Haystack Draw tributary to Whitney Creek in Sec. 27, T. 43 N., R. 4 W., M. D. B. and M., for storage purposes, for domestic and irrigation use. Estimated cost, \$9,000; fees paid, \$90.

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

NEVADA COUNTY—French Lake Dam No. 61-6. Nevada Irrigation District, Grass Valley, owner; rock dam situated on Canyon Creek tributary to South Yuba River in Sec. 17, T. 18 N., R. 13 E., M. D. B. and M.

NEVADA COUNTY—Sawmill Dam No. 61-10. Nevada Irrigation District, Grass Valley, owner; rock dam situated on Canyon Creek tributary to South Yuba River in Sec. 11, T. 18 N., R. 12 E., M. D. B. and M.

MODOC COUNTY—Plum Canyon Dam No. 139. Alice I. Porter and John Page, Alturas, owners; earth

dam situated on Plum Canyon tributary to Parker Creek in Sec. 32, T. 42 N., R. 14 E., M. D. B. and M.

NEVADA COUNTY—Floriston Dam No. 305-2. Crown Willamette Paper Company, San Francisco, owner; crib dam situated on Truckee River in Sec. 30, T. 18 N., R. 18 E., M. D. B. and M.

LASSEN COUNTY—Nelson Dam No. 231. Fred S. Benedict, Likely, owner; earth dam situated on Dry Creek tributary to Pit River in Sec. 24, T. 35 N., R. 12 E., M. D. B. and M.

INYO COUNTY—Tinemaha Dam No. 6-26. City of Los Angeles, Los Angeles, owner; earth dam, situated on Owens River in Sec. 25, T. 10 S., R. 34 E., M. D. B. and M.

NEVADA COUNTY—Francherie Dam No. 61-5. Nevada Irrigation District, Grass Valley, owner; timber dam, situated on Canyon Creek tributary to S. Yuba River in Sec. 13, T. 18 N., R. 12 E., M. D. B. and M.

MODOC COUNTY—Bonde Dam No. 124. M. H. Fayne, Merrill, Oregon, owner; earth dam, situated on Antelope Drainage tributary to Tule Lake in Sec. 27, T. 47 N., R. 6 E., M. D. B. and M.

LASSEN COUNTY—Antelope Dam No. 242. Pierre Ducasse, Termo, owner; earth dam, located in Sec. 3, T. 34 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Upper Roberts Dam No. 157. H. M. Roberts, Lookout, owner; earthfill, situated on Antelope Drainage tributary to Pit River in Sec. 29, T. 40 N., R. 7 E., M. D. B. and M.

MODOC COUNTY—Lower Roberts Dam No. 157-2. H. M. Roberts, Lookout, owner; earthfill, situated on Antelope Drainage tributary to Pit River in Sec. 11, T. 39 N., R. 7 E., M. D. B. and M.

MODOC COUNTY—Payne Dam No. 143. H. G. Payne, Alturas, owner; earth dam situated on unnamed drainage tributary to E. Fk Pitt River in Sec. 15, T. 41 N., R. 13 E., M. D. B. and M.

NEVADA COUNTY—Middle Lake Dam No. 61-13. Nevada Irrigation District, Grass Valley, owner; rock and earth, situated on S. Fk Canyon Creek tributary to S. Yuba River in Sec. 23, T. 18 N., R. 12 E., M. D. B. and M.

MARIPOSA COUNTY—Mountain King Dam No. 95-11. San Joaquin Light and Power Corporation, Fresno, owner; gravity, situated on Merced River tributary to San Joaquin River in Sec. 1, T. 4 S., R. 17 E., M. D. B. and M.

BUTTE COUNTY—Lost Creek Dam No. 63-2. Oroville-Wyandotte Irrigation District, Oroville, owner; arch dam, situated on Lost Creek tributary to S. Fk Feather River in Sec. 24, T. 20 N., R. 7 E., M. D. B. and M.

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

YUBA COUNTY—Lake Francis Dam No. 97-3. Pacific Gas and Electric Company, San Francisco, owner; earth, situated on Dobbins Creek tributary to Yuba River in Sec. 5 T. 17 N., R. 7 E., M. D. B. and M.

SIERRA COUNTY—Upper Sardine Dam No. 294-3. E. A. and J. O. Hayes, San Jose, owners; rock and earth, situated on Sardine Creek tributary to N. Fk Yuba River in Sec. 9, T. 20 N., R. 12 E., M. D. B. and M.

LOS ANGELES COUNTY—Mulholland Dam No. 6-17. City of Los Angeles, Los Angeles, owner; concrete gravity, situated on Weld Canyon in Sec. 3, T. 1 S., R. 14 W., S. B. B. and M.

SAN BERNARDINO COUNTY—Bear Valley Dam No. 803. Bear Valley Mutual Water Company, Redlands, owner; multiple arch, situated on Bear Creek tributary to Santa Ana River in Sec. 22, T. 2 N., R. 1 W., S. B. B. and M.

ALAMEDA COUNTY—Dingee Dam No. 31-14. East Bay Municipal Utility District, Oakland, owner; earth dam situated on unnamed draw, located at Estates drive and Bullard's drive, Oakland.

SIERRA COUNTY—Huntington Flat Dam No. 331-2. Loftus Blue Lead Mines Co., Los Angeles, owner; earth dam, situated on no stream in Sec. 7, T. 21 N., R. 10 E., M. D. B. and M.

SIERRA COUNTY—Mose Emery Dam No. 331-3. Loftus Blue Lead Mines Company, Los Angeles, owner; earth dam, situated on gulch tributary to Cedar Grove Ravine in Sec. 12, T. 21 N., R. 9 E., M. D. B. and M.

SIERRA COUNTY—Gardner's Point No. 331-4. Loftus Blue Lead Mines Company, Los Angeles, owner; earth dam situated on no stream in Sec. 13, T. 21 N., R. 9 E., M. D. B. and M.

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

SANTA CLARA COUNTY—Lower Howell Dam No. 622-2. San Jose Water Works, San Jose, owner; earth, situated on Rundell Creek tributary to Los Gatos Creek in Sec. 31, T. 8 S., R. 1 W., M. D. B. and M.

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

MODOC COUNTY—Little Juniper Dam No. 136. G. M. and J. E. Clark, Alturas, owners; earth, situated on Little Juniper Creek tributary to Pit River in Sec. 4, T. 40 N., R. 13 E., M. D. B. and M.

PLACER AND NEVADA COUNTIES—Van Geisen Dam No. 61-9. Nevada Irrigation Districts, Grass Valley, owner; arch dam situated on Bear River tributary to Yuba River in Sec. 2, T. 13 N., R. 8 E., M. D. B. and M.

LASSEN COUNTY—Lake Leavitt Dam No. 236-2. Lassen Irrigation District, Standish, owner, earth dam located in Sec. 15, T. 29 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—James Flat Dam No. 121. W. O. Blasingame and Fred H. Huffman, Alturas, owners; earth dam situated on Mosquito Creek tributary to Willow Creek in Sec. 25, T. 47 N., R. 10 E., M. D. B. and M.

MODOC COUNTY—Ess Ex Dam No. 121-2. S. X. Ranch, Alturas, owner; earth, situated on Salsbury Creek tributary to Pit River in Sec. 6, T. 42 N., R. 11 E., M. D. B. and M.

MODOC COUNTY—Huffman-Antelope Dam No. 121-3. W. O. Blasingame and Fred H. Huffman, Alturas, owners; earth dam situated on Antelope Plains tributary to Pit River in Sec. 11, T. 43 N., R. 10 E., M. D. B. and M.

MODOC COUNTY—Willow Creek Flat Dam No. 121-4. W. O. Blasingame and Fred H. Huffman, Alturas, owners; earth dam situated on Willow Creek tributary to Clear Lake in Sec. 24, T. 45 N., R. 10 E., M. D. B. and M.

PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources, during the month of October, 1930.

LOS ANGELES COUNTY—Whittier Reservoir No. 4/18-2. City of Whittier, Whittier, owner; earthfill, 54½ feet above streambed with a storage capacity of 32.3 acre-feet, situated on a foothill canyon tributary to San Gabriel River in Sec. 16, T. 2 S., R. 11 W., S. B. B. and M., for storage purposes for municipal use.

AMADOR COUNTY—Tiger Creek Dam No. 97-104. Pacific Gas and Electric Company, San Francisco, owner; slab and buttress, 100 feet above streambed with a storage capacity of 540 acre-feet, situated on Tiger Creek tributary to N. Fk Mokelumne River in Sec. 8, T. 7 N., R. 14 E., M. D. B. and M., for regulating purposes, for power use.

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

NEVADA COUNTY—Floriston Dam No. 305-2. Crown Willamette Paper Company, San Francisco, owner; crib dam, situated on Truckee River in Sec. 30, T. 18 N., R. 18 E., M. D. B. and M.

MODOC COUNTY—Plum Canyon Dam No. 139. Alice I. Porter and John Page, Alturas, owner; earth, situated on Plum Canyon tributary to Parker Creek in Sec. 32, T. 42 N., R. 14 E., M. D. B. and M.

LASSEN COUNTY—Nelson Dam No. 231. Fred S. Benedict, Likely, owner; earth, situated on Dry Creek tributary to Pit River in Sec. 24, T. 35 N., R. 12 E., M. D. B. and M.

INYO COUNTY—Tinemaha Dam No. 6-26. City of Los Angeles, Los Angeles, owner; earth, situated on Owens River in Sec. 25, T. 10 S., R. 34 E., M. D. B. and M.

MODOC COUNTY—Bonde Dam No. 124. M. H. Fayne, Merrill, Oregon, owner; earth, situated on Antelope Drainage tributary to Tule Lake in Sec. 27, T. 47 N., R. 6 E., M. D. B. and M.

MODOC COUNTY—Kelley & Greiner Dam No. 133. L. McHugh and Geo. L. Dewey, Alturas, owners; earth and rock dam.

SHASTA COUNTY—North Battle Creek Dam No. 97-96. Pacific Gas and Electric Company, San Francisco, owner; rockfill dam situated on North Battle Creek tributary to Battle Creek in Sec. 20, T. 32 N., R. 3 E., M. D. B. and M.

LASSSEN COUNTY—Antelope Dam No. 242. Pierre Ducasse, Termo, owner; earth dam situated on Madeline Plains in Sec. 3, T. 34 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Upper Roberts Dam No. 157. H. M. Roberts, Lookout, owner; earth, situated on Antelope Drainage tributary to Pit River in Sec. 29, T. 40 N., R. 7 E., M. D. B. and M.

NEVADA COUNTY—French Lake Dam No. 61-6. Nevada Irrigation District, Grass Valley, owner; rockfill, situated on Canyon Creek tributary to S. Yuba River in Sec. 17, T. 13 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Cantrall Dam No. 140. Charlotte Cantrall, Alturas, owner; earth dam, situated on a ditch tributary to Pine Creek in Sec. 33, T. 42 N., R. 13 E., M. D. B. and M.

BUTTE COUNTY—Lost Creek Dam No. 63-2. Oroville-Wyandotte Irrigation District, Oroville, owner; arch dam situated on Lost Creek tributary to S. Fork Feather River in Sec. 24, T. 20 N., R. 7 E., M. D. B. and M.

SIERRA COUNTY—Upper Sardine Lake Dam No. 294-3. E. A. and J. O. Hayes, San Jose, owners; rock and earth dam, situated on Sardine Creek, tributary to North Fork Yuba River in Sec. 9, T. 20 N., R. 12 E., M. D. B. and M.

BUTTE COUNTY—Magalia Dam No. 73. Paradise Irrigation District, Paradise, owner; earth dam situated on Little Butte Creek tributary to Sacramento River in Sec. 25, T. 23 N., R. 3 E., M. D. B. and M.

SIERRA COUNTY—Huntington Flat Dam No. 331-3. Loftus Blue Lead Mines Co., Los Angeles, owner; earth, located in Sec. 7, T. 21 N., R. 10 E., M. D. B. and M.

EDWARD HYATT, State Engineer.

November 1, 1930.

WATER APPLICATIONS AND PERMITS

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

STANISLAUS COUNTY—Application 6810. Turlock Irrigation District, c/o R. V. Meikle, Chief Eng., Turlock, California, 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. B. and M., for power purposes.

STANISLAUS COUNTY—Application 6811. Turlock Irrigation District, c/o R. V. Meikle, Chief Eng., Turlock, California, 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. B. and M., for domestic purposes. Estimated cost, \$50,000.

TULARE COUNTY—Application 6812. A. E. Stegeman, Posey, California, for .022 c.f.s. from an unnamed spring tributary to Bull Run Creek to be diverted in Sec. 36, T. 24 S., R. 31 E., M. D. B. and M., for recreational purposes. Estimated cost, \$200.

SANTA CRUZ COUNTY—Application 6813. Theodore J. Hoover, Swanton, California, for 5 c.f.s. from Waddell Creek tributary to the Pacific Ocean to be diverted in Sec. 35, T. 9 S., R. 4 W., M. D. B. and M., for irrigation purposes. Estimated cost, \$2,500.

SAN BERNARDINO COUNTY—Application 6814. The Metropolitan Water District of Southern California, 222 South Hill St., Los Angeles California, for 15,000 c.f.s. and 717,000 a.f. from Colorado River Tributary to the Pacific Ocean to be diverted in Sec. 4, T. 2 N., R. 27 E., S. E. B. and M., for power purposes. Estimated cost, \$20,000,000.

RIVERSIDE COUNTY—Application 6815. Charles A. Buck, P. O. Box 111, Banning, California, for 0.25 m.f. from an unnamed spring tributary to Whitewater River Watershed to be diverted in Sec. 7, T. 4 S., R. 2 E., S. E. B. and M., for irrigation and domestic purposes. Estimated cost, \$175.

HUMBOLDT COUNTY—Application 6816. George H. Bergin, Weaverville, California, for 150 c.f.s. from Cedar Creek and Horse Linto Creek tributaries to Trinity River to be diverted in Sections 29 and 8, T. 7 N., R. 6 E., H. B. and M., for mining purposes. Estimated cost \$150,000.

EL DORADO COUNTY—Application 6817. H. A. Linthicum and W. D. Meyers, 137 Carmel Ave., Roseville California, for 400 g.p.d. from an unnamed stream tributary to S. Fk. of American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. B. and M., for domestic purposes. Estimated cost, \$200.

PLUMAS COUNTY—Application 6818. Victor Challen, c/o Cooper Challen Realty Co., Inc., 7 West Santa Clara St., San Jose, California, for 1.0 c.f.s. from Clear Creek tributary to Butt Creek, thence N. Fk. Feather River to be diverted in Sec. 27, T. 25 N., R. 7 E., M. D. B. and M., for mining and domestic purposes. Estimated cost \$100.

EL DORADO COUNTY—Application 6819. H. L. Fowlar, Georgetown, California, for 12 c.f.s. from Pilot Creek tributary to Rubicon River, thence Middle Fork American River to be diverted in Sec. 4, T. 12 N., R. 12 E., M. D. B. and M., for irrigation purposes.

SISKIYOU COUNTY—Application 6820. Mrs. Ella E. George, Cecilville, California, for 50 c.f.s. from E. Fk. of Six Mile Creek tributary to E. Fk. of S. Fk. of Salmon River to be diverted in Sec. 11, T. 39 N., R. 10 W. M. D. B. and M., for mining purposes. Estimated cost, \$5,000.

LOS ANGELES COUNTY—Application 6821. Gus Wissendorf, Swartout, California, for 14 c.f.s. from Mine Gulch tributary to Prairie Fork, thence San Gabriel River to be diverted in Sec. 17, T. 3 N., R. 8 W., S. E. B. and M., for mining and domestic purposes.

MODOC COUNTY—Application 6822. Bidwell Electric Co., c/o C. H. Aldridge, owner, Fort Bidwell, California, for 1.0 c.f.s. from Harper Creek tributary to Bidwell Creek to be diverted in Sec. 6, T. 46 N., R. 16 E., M. D. B. and M., for power purposes. Estimated cost, \$1,000.

AMADOR COUNTY—Application 6823. Frank Du Bois, 2951 First Ave., Sacramento, California, for 0.04 c.f.s. from Crysta Spring (formerly Twin Spring) tributary to N. Fk. of Mokelumne River to be diverted in Sec. 31, T. 7 N., R. 12 E., M. D. B. and M., for mining and domestic purposes. Estimated cost, \$1,000.

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

EL DORADO COUNTY—Permit 3579. Application 6727. Issued to Ira W. Kibby, Sacramento, Cal., October 1, 1930, for 0.01 c.f.s. from an unnamed spring in Sec. 15, T. 11 N., R. 17 E., M. D. M., for domestic use.

MONO COUNTY—Permit 3580. Application 6636. Issued to C. E. Brodie, Los Angeles, Cal., October 1, 1930, for 0.01 c.f.s. from Rock Creek in Sec. 33, T. 4 S. R. 30 E., M. D. M., for domestic use. Estimated cost \$175.

MERCED COUNTY—Permit 3581. Application 6603. Issued to J. L. Firpo and J. Caraglio, Cressey, Cal., October 2, 1930, for 4 c.f.s. from Merced River, in Sec. 35, T. 5 S., R. 12 E., M. D. M., for irrigation on 329.7 acres. Estimated cost \$2,200.

MERCED COUNTY—Permit 3582. Application 6479. Issued to C. L. Schmidt, Gustine, Cal., October 2, 1930, for 0.31 c.f.s. from Dry Creek in Sec. 13, T. 5 S., R. 12 E., M. D. M., for irrigation on 25 acres. Estimated cost, \$500.

SAN BERNARDINO COUNTY—Permit 3583. Application 6695. Issued to Robert S. Irwin, Lucerne Valley, Cal., October 3, 1930, for 0.5 c.f.s. from two unnamed springs in Sec. 10, T. 3 N., R. 1 W., S. B. M. for irrigation and domestic on 40 acres. Estimated cost \$3,000.

RIVERSIDE COUNTY—Permit 3584. Application 6629. Issued to O. J. McMahan, Idyllwild, Cal., October 17, 1930, for 0.02 c.f.s. from an unnamed stream in Sec. 4, T. 7 S., R. 3 E., S. E. B. M., for irrigation and domestic use on 10 acres. Estimated cost, \$2,000.

EL DORADO COUNTY—Permit 3585. Application 6730. Issued to Mrs. Ida Raught et al. Kyburz, Cal., October 17, 1930, for 0.02 c.f.s. from an unnamed spring in Sec. 30, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$200.

MONO COUNTY—Permit 3586. Application 6547. Issued to Gladys Koebig, Los Angeles, Cal., October 17, 1930, for 200 g.p.d. from small unnamed stream in Sec. 17, T. 4 S., R. 27 E., M. D. M., for domestic use. Estimated cost \$90.

AMADOR, CALAVERAS COUNTIES—Permit 3587. Application 5128. Issued to East Bay Municipal Util-

ity Dist., Oakland, Cal., October 18, 1930, for 375 c.f.s. and 50,000 acre-feet from Mokelumne River in Sec. 26, T. 5 N., R. 10 E., M. D. M., for power use.

COLUSA COUNTY—Permit 3588, Application 6672. Issued to Colusa Development Co. of Colusa, Cal., October 21, 1930, for 9.87 c.f.s. from Sacramento River in Sec. 26, T. 14 N., R. 1 E., M. D. M., for irrigation on 789.7 acres. Estimated cost \$20,000.

COLUSA COUNTY—Permit 3689, Application 6696. Issued to J. W. Browning, Grimes, Cal., October 21, 1930, for 5.95 c.f.s. from Sacramento River in Sec. 6, T. 14 N., R. 1 E., M. D. M., for use for irrigation on 476.2 acres. Estimated cost \$6,690.

STANISLAUS COUNTY—Permit 3590, Application 6574. Issued to J. M. de Souza, Modesto, Cal., October 21, 1930, for 0.41 c.f.s. from Tuolumne River, in Sec. 12, T. 4 S., R. 7 E., M. D. M., for irrigation on 33 acres. Estimated cost, \$1,500.

NEVADA COUNTY—Permit 3591, Application 5876. Issued to Spanish Mining Co., San Francisco, Cal., October 25, 1930, for 15 c.f.s. from Poorman's Creek in Sec. 31, T. 18 N., R. 11 E., M. D. M., for use for power. Estimated cost, \$11,000.

LASSEN COUNTY—Permit 3592, Application 5812. Issued to G. L. Kramer Bieber, Cal., October 25, 1930, for 6.75 c.f.s. from Widow Valley Creek in Sec. 31, T. 39 N., R. 7 E., M. D. M., for irrigation and stock watering on 540 acres. Estimated cost, \$3,000.

SAN BERNARDINO COUNTY—Permit 3593, Application 4807. Issued to Water Conservation Association of Riverside, Cal., October 25, 1930, for 250,000 acre-feet per annum storage from Santa Ana River in Sec. 4, T. 1 S., R. 2 W., S. B. M., for use for irrigation and domestic on 52,640 acres. Estimated cost, \$100,000.

COLUSA COUNTY—Permit 3594, Application 6760. Issued to M. E. Hastings, Maxwell, Cal., October 27, 1930, for 1.0 c.f.s. from Stone Corral Creek in Sec. 33, T. 17 N., R. 3 W., M. D. M., for use for irrigation on 81 acres.

INYO COUNTY—Permit 3595, Application 6724. Issued to Burnham Chemical Co., Westend, Cal., October 28, 1930, for 0.007 c.f.s. from Parsons and Barnett canyons in Secs. 28 and 34, T. 23 S., R. 42 E., M. D. M., for use for industrial and domestic purposes. Estimated cost \$10,000.

SAN BERNARDINO COUNTY—Permit 3596, Application 6736. Issued to Raymon M. Hart of Pine Knot, Cal., October 28, 1930, for 0.014 c.f.s. from an unnamed spring in Sec. 28, T. 2 N., R. 1 E., S. B. M., for irrigation, domestic, and fox raising. Estimated cost, \$500.

SUTTER COUNTY—Permit 3597, Application 6527. Issued to J. T. Cummins Ranch Co. of Knights Landing, Cal., October 28, 1930, for 5.96 c.f.s. from Sacramento River in Sec. 1, T. 12 N., R. 1 E., M. D. M., for irrigation on 476.75 acres. Estimated cost, \$7,000.

MONO COUNTY—Permit 3598, Application 6692. Issued to Henry Heyman, Long Beach, Cal., October 29, 1930, for 200 g.p.d. from Rock Creek in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic use. Estimated cost \$300.

TRINITY COUNTY—Permit 3599, Application 6752. Issued to Charles Roderic Delaney, Forest Glen, Cal., October 29, 1930, for 2.5 c.f.s. from Little Rattlesnake Creek in Sec. 17, T. 1 S., R. 8 E., M. D. M. for mining and domestic purposes. Estimated cost, \$100.

JAPAN BANS GRADE CROSSING CLAIMS

While American railroads continue the expenditure of millions of dollars annually on safety devices and educational work to prevent grade crossing accidents, the supreme court of Japan has approached the solution of the problem from an altogether different angle.

"In the future," it is reported in a recent issue of the Japan Advertiser, published in Tokio, "the motorist who races trains to crossings will do so at his own risk. His heirs will have no claim on any railway company, public or private, if his temerity sends him on a journey he had not expected to take so immediately.

"The new ruling," the article continues, "is a recognition of the fact that this is an age of speed and that the country will be benefited more by faster train schedules than by preserving the lives of idiots who race trains to crossings."

NIGHT DRIVING

Big yellow headlights coming down the road,
Little red tail lights, each one with a load;
Whirring of the motor—bang! goes the
exhaust.

Hurry, for each minute lagged is a minute
lost.

Run up the speedometer—never mind the
law—

Pass that poky driver—he's the worst I ever
saw!

An extra shot of gasoline, see her waste the
oil—

Watch the motormeter red—almost at a boil.
Lots of miles behind us—just a few to make—

And we'll beat the record by the risks we take.
Aw, what's the use of rushing, now we trail a
truck

On a twisting mountain road—doggone the
luck!

—ADRIA S. HARRISON.

THE ROAD OF YESTERDAY

BY WILLIAM FELTER

Along the Road of Yesterday
The ox-wain creaked across the plain.
'Twere men of vision blazed the trail,
Or else today had dawned in vain.
A cabin stands beside the road,
Its crumbling walls gone to decay.
Who knows its story? Who can tell
When love and laughter passed this way?

Along the Road of Yesterday
Came caravans for golden gain;
The wrecks still strew the desert sand,
Their bones lie bleaching on the plain.
Who knows what failure or success
Rewarded effort? Who can say
Who faltered? Who at last won through
Uncharted Roads of Yesterday?

For now great highways gird the plain
That once was trackless. Cities sprang
Like magic at Industries' touch—
The whistles shrilled, the school bells rang.
Though sand has drifted o'er the bones
Of those who perished on the way,
Those who won through built monuments
Along the Road of Yesterday.

Sister—Was Maude in a bright red frock at the
dance?

Brother—Some of her, darling, some of her.

"Do you know how to find the horse power of a
car?"

"No."

"Easy—just lift the hood and count the plugs."—
Oil Weekly.

STATE OF CALIFORNIA
Department of Public Works

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Port of San Jose—Not appointed
Port of San Diego—Edgar A. Luce

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



CALIFORNIA STATE PRINTING OFFICE
SACRAMENTO 1938