

✓ Public Works

California Highways and Public Works



Main Entrance to State Teachers College at San Diego

Official Journal of the Department of Public Works
State of California

OCTOBER

1929

V 70 110



Table of Contents



	Page
Budget Plan has Reduced Overhead Costs—By <i>C. H. Purcell, State Highway Engineer</i>	1
The Growth of Motoring in California—By <i>Marshall A. Page, Chief Clerk of the Division of Motor Vehicles</i>	2
His Job Is To See That Dams are Safe.....	5
Alturas Banquet Has Novel Menu.....	6
Taming the Desert Cloudburst.....	7
California Leads in State Aid to County Highways.....	8
Signs and Roadside Structures; Necessity and Methods of Control— By <i>Dr. L. I. Hewes, Deputy Chief Engineer, U. S. Bureau of Public Roads</i>	9
U. S.-California Join in Traffic Survey.....	11
Highway Beautification as Viewed by Expert.....	11
Experimental Road Surface Construction—By <i>T. H. Dennis, Maintenance Engineer</i>	13
San Diego Teachers College Shows How State is Planning For Future—By <i>George B. McDougall, Chief of the Division of Architecture</i>	14
Clippings, Letters and Comment Dealing With State Highways.....	16 to 18
Lauds Success in Obtaining U. S. Aid For Bay Bridge and Water Investigation.....	18
September Awards Assure Major Highway Improvements.....	20
Acceptances of Contracts.....	20
Licensing Forms for Contractors are Now Available.....	21
Massachusetts Plan for Beautifying Roadsides.....	22
New Law Will Aid in Keeping Highways Attractive.....	23
A Plea for Beautiful Highways—By <i>Ray Lyman Wilbur, Secretary of the Interior</i>	24
September Activities of the Division of Water Resources.....	25 to 27
Motor Vehicle Division Reports.....	27
State Highway Work over State.....	28 to 34
Highway Bid Openings.....	34
Water Permits and Applications.....	35
Award of Contracts by Division of Architecture.....	36



Building Roads Under Budget Plan Has Materially Reduced Overhead Costs

By C. H. PURCELL, State Highway Engineer

IN AN engineering organization such as the Division of Highways, the ratio of expenditures for overhead to total expenditures depends greatly upon the extent to which work can be planned in advance. The present system of financing highway expenditures in California lends itself to an orderly planning of the work as revenue becomes available at frequent intervals and in amounts that can be closely estimated in advance.

In financing highway activities from bond issues, there is the disadvantage that a large amount of money becomes available at one time without any definite plans as to its expenditure. It then becomes necessary to build up a large organization, and to conduct such surveys and studies as are necessary to plan the expenditure of the funds available. As the bond fund becomes depleted, the need for such a large organization decreases, but as it is difficult to break down such an organization rapidly, a high overhead percentage will result, and the organization will lose many of its valuable employees. When another bond issue is passed, all of the work of building up the organization must be repeated and at a considerable expense to the overhead ratio.

Financing highway expenditures from current continuous revenues permits the building of an organization which can be held down to a point where it is employed at its maximum capacity in carefully planning and supervising the expenditure of the funds available. This department now prepares a complete detailed budget for two years in advance which, when approved by the California Highway Commission, the Director of Public

Works, and the legislature, becomes the official program for the biennium. The State Highway Engineer can then concentrate the entire organization upon the systematic prosecution of this program, taking into consideration seasonal and regional conditions with the object of obtaining the utmost efficiency. In the meantime, plans and studies are going ahead in the development of a budget for the next two-year period.

An important advantage of the two-year budget plan is that when the State Highway

Engineer has developed a budgeted project to the point where it is ready to be undertaken, no unnecessary delay is involved as the project already has the approval of the California Highway Commission, and with the approval of the Director of Public Works, a contract can be entered into forthwith.

Our overhead ratio is showing the effect of this system of planning. At the beginning of the biennium just passed, we were confronted with the budgeting and expenditure of the new revenue available from the one-cent

gasoline tax, which for the biennium amounted to over \$16,000,000. Consequently, the greater part of the first year was spent in adjusting the organization to the increased activity resulting from this additional revenue, and the increased revenue from the two-cent gasoline tax. In spite of that fact, the ratio of overhead to total expenditures for the biennium was 4.43 per cent as compared to 4.85 per cent, which has been the average overhead ratio since the inception of the organization in 1912. The percentage for June was 3.46 per cent, and for July 3.16 per

OVERHEAD COSTS ARE LOWEST IN HISTORY OF STATE HIGHWAY SYSTEM

The state highway overhead percentage is now at the lowest point since the inception of the state highway organization in 1910.

The average overhead expense since the inception of the organization has been 4.85 per cent. During the biennial period beginning July 1, 1927, and ending June 30, 1929, the overhead costs were reduced from 5.38 per cent at the beginning of the biennium to 3.46 per cent at its close.

The Division of Highways is endeavoring to still further reduce this overhead cost, and confidently expects to do so during the current biennium.

The amount added to project costs for contingencies has been cut from 12 per cent to 5 per cent during the past biennium.

The Growth of Motoring In California

By MARSHALL A. PAGE, Chief Clerk of the Division of Motor Vehicles

CALIFORNIA is truly a state on wheels and the oft-repeated statement that it is the "motoring ground of the nation" is no idle boast.

But to the staff of the Division of Motor Vehicles as to no others has the amazing growth of the use of the motor vehicle in the state been a constant source of wonder. Five years ago it was predicted confidently that the "saturation point" had been reached. But five years has seen an increase of nearly a million vehicles, and there seems to be no end.

MAY LEAD NATION

Today we lead every state in the Union in numbers with the exception of New York and it is possible that the end of the current year may find us even ahead of the Empire state.



An ocean view in Orange County on the Coast Highway.

Figured on a per capita basis, we are far ahead of any other state. Our records as of June 30th last show a total fee paid registration of 1,859,523. This, divided into the mid-year estimate of the State Bureau of Vital Statistics of 4,456,659 population for the state, gives us one car for approximately every 2.4 persons in California.

Excluding every type of vehicle with the exception of pleasure or passenger cars, the mid-year figure, which is 1,737,961, gives us one car for approximately every 2.6 persons. The nearest approach to this is our next door neighbor, Nevada, with one car for every 2.8 persons. New York, our old rival from



Mt. Shasta inspires the motorists along this highway.

point of numbers, is far down the list with 5.5 persons for every car.

ALL COULD "JOY RIDE"

Indeed if we were to add all the motorcycles, dealers' cars and the exempt vehicles used by the state, cities, counties and other political subdivisions and by public utility corporations, it is safe to say we would have close to one vehicle for every two persons in California.

Our passenger cars alone could take the entire population of California "joy riding" and there would be room to take along the populations of Arizona, New Mexico, Nevada, Wyoming and possibly Idaho as our guests.



Oranges and palms adorn this southern California road.

More romantic even than the story of the ill-fated and short-lived "pony express" or the rumbling "Conestoga" wagons that blazed the trails in the American wilderness of the west is the story of this amazing growth of motoring in California.

THE FIRST REGISTRATION

It was on May 5, 1905, barely twenty years after Gottlieb Daimler's invention of the internal combustion motor that was to revolutionize the world of transportation, that motor vehicle history began officially in California. On that date the first car, a White steamer, was registered by Charles F. Curry, then the Secretary of State. The registrant was John D. Spreckels, well known California capitalist. He paid \$2 as his fee and was assigned a number.



The motorist travels this causeway as he approaches the redwood country.

At that early date there were only about 80,000 such vehicles in the entire world. Inventors were still struggling with the idea that the steam locomotive could be evolved into a practical carriage for individual use. Steam bicycles were still the dream of many and many others were wrestling with the problem of flying, a field of endeavor that had intrigued the mind of men long before locomotives or motor vehicles were thought of.

SIGNS OF PROGRESS

In less than two years after Mr. Spreckels registered his vehicle more than 10,000 had been registered. The cars of that era were not the beautiful creations with their luxurious appointments and numerous devices for comfort and safety of our day. For the most part they were of the chugging, one-cylinder type and the duster and goggles were an indispensable part of the motorist's equipment.



The Kern River Canyon offers unique views to the motorist.

Two or three of these old-timers are still in our records, having apparently weathered the vicissitudes of time. The greater part of them, however, have long since found their way to the inevitable junk yard.

By 1915, registrations had leaped to 163,795 and motoring was no longer the sport of the foolhardy. It had become an integral part of the community life of California. Realizing that motoring had grown to such proportions as to make registrations a burden on any existing state department, the legislature passed a bill introduced by Senator E. S. Birdsall of Auburn providing for a motor vehicle department to have exclusive charge of all such records. H. A. French was selected by Governor Hiram W. Johnson as the first chief of the department.

REGISTRATIONS KEEP GAINING

The World War did not retard the growth of motoring but apparently stimulated it.



Motoring among the blossoms of Santa Clara County's orchards.

Registrations leaped to 232,440 in 1916, to 306,916 in 1917, to 364,800 in 1918 and to 477,450 in 1919. The million mark was passed in 1923.

A glance at world motor vehicle statistics will show California has forged far ahead of every other part of the globe in motor ownership. Latest figures of the automotive division of the federal bureau of foreign and domestic commerce show a total of 31,778,203 motor vehicles in the world. Seventy-seven per cent, or 24,493,124 of these, are in the United States. And of those in the United States approximately 2,000,000, or about 8 per cent, are in California.

MANY FACTORS

Many factors are responsible for this phenomenal growth. First of all there is California's matchless climate, a constant lure



The highway along historic Donner Lake is filled with interest.

to its population to get out of doors. In the east the motor owner puts his car in the garage along about the middle of November, jacks up the wheels, fills the radiator with an anti-freezing solution and keeps it there until the first of April.

Not so in California. Aside from its commercial uses, the family car gets just as much service in winter as in summer. Picnic parties may be found along any California highway in December or January on week-end days. The roads leading to the "snow line" of the Sierra are crowded throughout the winter with motorists who drive in an hour or two from sun-bathed valleys to snow-crested mountain tops.

In summer almost everybody "goes on vacation" in California. That means either a trip to the mountains or to the seashore.

Either can be reached in three or four hours at most.

LESS DEPRECIATION

California is a lucrative field for the automobile dealer because cars are used more and wear out faster as a consequence. Depreciation, the bugbear of motor finance, is not the factor in California it is in other states because the car is used constantly.

That the joys of motoring in California are being appreciated by residents of other states is evidenced by the increasing number of out-of-state cars we register each year. Last year we issued nonresident permits for 83,506 cars and there were thousands of others that entered the state for short periods that were not registered. Up to August 31st, this year, we had issued 50,917 permits.

LIBERAL POLICY

California has a very liberal policy in connection with the out-of-state motorist. He is permitted to remain here six months before he is required to take out a California license. Under the new law if his six-month permit expires in December he is not required to take out the new license until January, an arrangement which relieves him from paying a double fee.

Something of the amazing use of the motor vehicle is obtained from the report of the State Board of Equalization showing total gasoline consumption in California of 1,101,403,169 gallons for 1928 and 595,288,172 gallons for the first six months of 1929. Taking 15 miles a gallon as an average would give a total of 16,521,047,535 motor miles for 1928 and 8,929,322,580 for the first half of the current year.

(Continued on page 23.)

I AM THE HIGHWAY

I am the highway! O'er my polished floors
Is found the way to verdant things outdoors;
I am the path that circles peaceful grange
O'er tempting hill and towering mountain range:
I am the way to neighbor's yon abode
Where interchange of thought might ease a load,
Or lighten heart, or free a pinioned mind
From all the shackles that enchain mankind.

I am the highway! Over yonder hill
Where lilt the brook and sings the whippoorwill
Dame Fortune might entrance you with her wife
Or yet enrichen with her golden smile.
Who fares my fashioned path shall keep the pace
That Progress sets in vanguard of the race,
And, daring Fate, restraining cares and fears,
Rides on in triumph with the Pioneers.

Platt Young in *Georgia Highways Magazine*.

His Job Is To See That Dams Are Safe

TO CARRY OUT the provisions of chapter 766 of the Statutes of 1929, Mr. George W. Hawley of Berkeley has been appointed deputy in charge of dams to administer, under the direction of the State Engineer, the recent legislative enactment which places the supervision of all dams, other than federal dams, within the State of California, under the jurisdiction of the Department of Public Works.

The legislation provided in this act is the most complete and authoritative legislation relating to the supervision of dams enacted by any governmental agency. It provides for inspection, examination and approval of dams already constructed, makes mandatory the approval by state authority of the plans and specifications of any dam to be built, prior to the beginning of construction, grants the State Engineer authority to supervise enlargements, additions, modifications or repairs to existing dams and provides for the supervision of the maintenance and operation of dams in so far as is necessary to safeguard life and property.

Mr. Hawley has had wide experience in the engineering design and construction of dams. Since his graduation from Stanford University in 1913 he has been almost continuously employed in the engineering of storage projects.

Following his first employment Mr. Hawley served in the capacity of inspector, superintendent of construction, and later construction engineer for the South San Joaquin Irrigation District. During this period of employment, Mr. Hawley was in charge of the preparations of the foundations for and the construction of the Woodward dam, supply tunnel and reservoir control. He was then engineer in charge of construction on the San Pablo project of the East Bay Water Company. This project involved heavy foundation, dam and tunnel construction, the cost of which was about \$3,500,000. He also served as engineer in charge of construction for the Upper San Leandro project of the same company. This project involved the construction of a high dam and the necessary tunnel diversion and control works. The cost of this project was about \$2,500,000. While in the employ of the water company he was engineer in charge of the engineering investigation for an additional water supply for the



GEORGE W. HAWLEY.

East Bay municipalities. This investigation included an examination and engineering study of the many available sources of water supply and the engineering structures necessary to develop a 200,000 m.g.d. water supply.

Mr. Hawley served as engineer on a water storage project for the irrigation of about 100,000 acres of land in the Davis-Dixon-Woodland area. He was employed as consulting engineer for the Port Costa Water Company, reporting upon the necessary diversion, storage and treatment works to make the Sacramento River waters available for domestic and industrial uses in the north bay area. He has also acted as consulting engineer for the El Dorado Irrigation District, reporting upon the development of a storage project for that district, and has also advised on numerous other special engineering investigations.

While employed as engineer in charge of water supply investigations and construction

for the East Bay Water Company, Mr. Hawley was afforded the opportunity and privilege of visiting a large number of the storage works in California and spent about a two-month period visiting storage works throughout the United States.

Mr. Hawley is a member of the American Society of Civil Engineers and of the American Water Works Association. The announcement by Governor Young of his appointment immediately met with the hearty approval of the engineering profession at large.

The act which Mr. Hawley will administer is a composite act embodying the salient features of the many drafts presented by individuals, engineering groups, municipalities, irrigation districts, power companies, legislative bodies, other states and outstanding legal authorities. The tentative drafts submitted were seriously and conscientiously analyzed and studied and many conferences held to properly and logically discuss the ramifications of the proposals and to reconcile the outstanding or major differences of opinion.

The pertinent and outstanding provisions of these tentative drafts were incorporated in the present act, thus assuring the people of California that every effort humanly possible has been exerted to provide legislation adequate to thoroughly safeguard life and property. The act fully meets with the approval of all parties who are vitally interested, and it is in accord with sound engineering, financial and economic principles. The administration of the act is vested in the Department of Public Works, to be administered by the State Engineer. A satisfactory and successful functioning of the act in accordance with its intent is in a large measure dependent upon the aggressive, judicious and reasonable enforcement of the provisions of the act in accordance with sound engineering practice and judgment.

Commenting upon Mr. Haawley's appointment, Governor Young said:

"The organic act of the state, designated as chapter 766 of the Statutes of 1929, is an act providing for the supervision of dams by the Department of Public Works through the State Engineer for the purpose of safeguarding life and property. The act defines the powers and duties concerning the supervision of dams, provides for the enforcement of said supervision, provides penalties for violation thereof and makes an appropriation for carrying out the provisions of the act. The 1929 legislature, cognizant of the imperative need of conferring authority and responsibility for the supervision of dams as to their safety

Alturas Banquet Has Novel Menu

The following menu, written by John P. Callaghan, realtor of Alturas, appeared in a souvenir program at a banquet tendered members of the California Highway Commission and members of their party at Alturas on October 4th:

MENU

SOUP

Consomme is easily removed from the vest or linen but nobody seems to be crazy about it. Regular soup, such as cream tomato, has high visibility on vest and linen, but then it makes extra dishes to wash and what with folks being careless about soup spoons, and the like, there will be no soup. Not tonight.

SHRIMP COCKTAIL

FRUIT SALAD

The above are recommended by the Committee as highly nutritious! Made entirely from products grown in Alturas and vicinity, except the shrimp cans.

VENISON STEAKS CHICKEN A LA KING

When you have surrounded your choice of either or both of the above entries you will agree with the Committee that the rest of the line-up until you hit the apple pie a la mode isn't worth a damn except as scenery, so in order to save printing costs we aren't even going to set them down here, except to say that it is the usual stuff like pickles, olives, mustard and etc. But don't forget to give that apple pie a heavy play—it is the national dish of Modoc.

Now that dinner has been served and eaten, it may be told. It was intended primarily (!) to supply each guest with a ten-pound hunk of venison mounted in a fifty-pound block of ice as a souvenir. To supply this amount of meat the whole Chamber of Commerce went hunting for a week and didn't kill nothing—not even a member of the Chamber. So in order to keep this meal from being a flop it was necessary to resort to strategy (!). Dock Aule went to see one of the county's original inhabitants who seems to know what a rifle is all about. Next day the following conversation might have been heard with a dictaphone:

"Well, Dock, catchum meat. Gottum over Lauer warehouse right now. Good one. I suppose you have the tag on the horns and everything. No gotum tag and no place to put tag, Dock, but awful nice meat. Eight dollars cheap. Got two little ones you can have for four dollars for two."

under centralized state authority, initiated by this office, accomplished the approval of this desired dam legislation. The future development of the State of California is intimately related with and dependent upon the fullest economic utilization of the water resources of the state. The natural stream flow of the state is approaching exhaustion and the future water supply will be obtained chiefly.

(Continued on page 23.)

Taming the Desert Cloudburst

"Travelers from the valley to Los Angeles by auto, who wondered why the state was spending money erecting huge mounds of earth along the highway beyond Kane Springs, had the answer given for them in Sunday's storm.

"Practically useless the greater part of the year, the flood protection system built by the State Highway Commission proves its worth in a single day when the wild waters rush down through gorges and the dry desert becomes an inland sea.

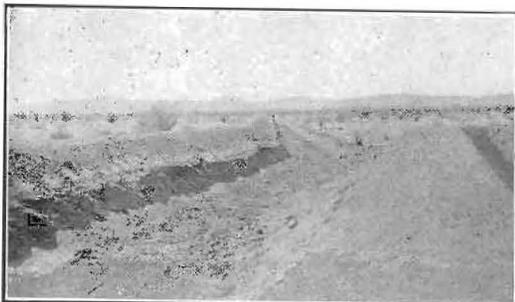
"In former years such an occurrence played havoc with automobile traffic to and from the valley on the Salton Sea route. Sunday's storm, thanks to the protective system, did little or no damage to the highway. The railroad, without such protection, is placed out of commission.

"People who have never seen it can not imagine the force and fury of these desert torrents which are created in a minute, rush wildly on their course, sweeping all in their path, and disappear as quickly as they start, leaving costly damage in their wake.

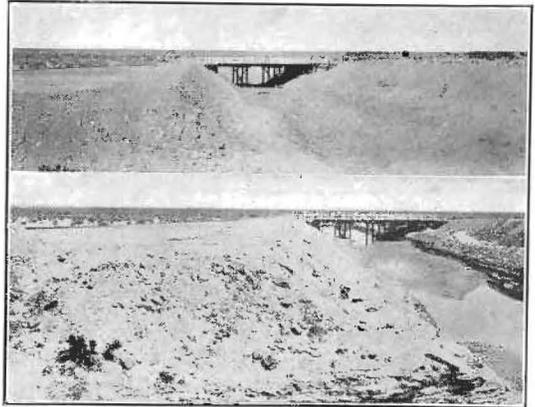
"The highway flood protection system is worth every cent it cost, even if its only benefit was to prevent a huge repair bill on the highway. The fact that it also prevents loss of time in transporting people and merchandise is additional justification for its construction."

The above editorial taken from the columns of an Imperial Valley newspaper paints a graphic picture of a new system of storm protection on desert highways in the south that has had its first test this year. The following telegram to headquarters from District Engineer E. Q. Sullivan, dated August 6th, also tells a graphic story:

Repeated heavy cloudbursts for past three days over all desert roads have caused damage on unimproved sections of routes 31, 58 and 64. Traffic is going through on all these routes. It will require several weeks to put some sections of these roads back in first-class condition, but most of these roads will be in good condition



General view of storm protection ditch system.



Upper view, storm protection ditch and bridge over the ditch as constructed on the highway along the Salton Sea; lower view, picture taken from same location as above after the flood. Note that the channel has been dug deeper by the water and that the water went under the bridge without damage to the highway. Previous to construction of the storm protection system this water would have all crossed over the highway surface injuring or destroying the pavement.

again by end of this week. Union Pacific, Tonopah and Tidewater and Southern Pacific railroads are still tied up by washouts due to these storms. Damage to our new work where we have installed storm protection systems is confined to some minor fill settlements at bridges due to deep scouring of ditches. All ditches held and carried the flood waters and the storm protection systems worked as planned in protection of our new pavements.

The condition which the new system of protective ditch work was designed to meet is a difficult one.

The rainfall in the desert area of Riverside, Imperial and San Bernardino counties is about five inches per year and usually falls in two or three localized storms in either winter or summer season and in cloudburst proportions.

The mountains adjacent to the highways are rocky and barren and have steep slopes, causing the streams to rise rapidly during the heavy storms and also to subside rapidly.

At the mouth of the canyon where the streams' velocity is retarded, due to the flattening of slopes, large debris cones are built up, and the streams do not follow a defined channel or otherwise the channels are shifting from one side to the other of the cones.

The highway following in the valleys passes over the various debris cones, and the

usual practice was to place dips in the highway by depressing the surfaces of roadway through the various washes.

These dips were not satisfactory, as the floods would deposit gravel, mud and even boulders on the highway, or in other cases begin cutting at the lower edge of the road and washing out the road.

To overcome these washouts, drainage ditches are dug across the various washes, collecting the water and conveying it to the larger control ditches, which then cross the highway at various locations, bridges being placed on the highway across these control ditches.

The ditches vary in size from about 3 feet wide on small subsidiary ditches to 20 feet wide and 6 feet deep on the larger controls. The earth excavated from the ditches is placed in levees on the lower side of the ditch.

The first work of this kind consisted of constructing about 17 miles of ditches and eight



When the storm waters crossed at will.

timber bridges as a drainage system to protect the 19.7 miles of roadway between Trifolium Canal and Salada Wash on Route 26 in Imperial County. This contract involved moving 216,940 cubic yards of material from the ditch system at a cost of \$26,755.93, and the entire contract, with the bridges and incidental features, cost the state a total of \$58,369.70. This contract was awarded to Conway & Morrow on March 23, 1928, the contract being assigned by them to the Callahan Construction Company, who did the work. The contract was accepted on October 16, 1928.

Under another contract on the Mecca-to-Blythe highway in Riverside County Geo. Herz and Company constructed about 23 miles of ditches and 17 bridges to protect the 22.10 miles of roadway between $9\frac{1}{2}$ miles west of Hopkins Wells and Black Butte. The protection system involved moving 303,861 cubic yards of material at a cost of \$36,463.32 and bridges costing an additional \$48,084.97, and

California Leads In State Aid to County Highways

WASHINGTON, D. C.—States are helping counties in local road building at a rate which makes unnecessary the extension of the federal aid principle to the construction of by-roads, according to a bulletin issued by the American Highway Educational Bureau.

Especial attention is called to the fact that counties already are receiving from states more than \$118,000,000 annually for use in local road construction.

From an examination of reports it appears that the largest sum going back to counties in any one state for the construction of local roads is in California. Here the total turn-back from license fees and gas tax amounts to over \$13,750,000 annually. When it is remembered that California's first bond issue to get road building under way amounted to only \$18,000,000, to be applied over the entire state, the sum now going to counties annually as a direct result of that first step shows how income from motor vehicles for road building purposes has been stimulated by the original program. In other words, one good highway investment is turning back increased capital for other investments of like character without having to look to bond issues or federal aid on outer roads.

was done in connection with grading and surfacing the roadway which the system protected. The contract was awarded on September 7, 1928, and accepted on July 18, 1929.

In a letter written subsequently to the August 6th telegram, Mr. Sullivan further wrote his impressions of the new system as follows:

The storm protection system along the Salton Sea, without question, paid back its entire cost in this one storm alone. Our past experience has shown that the damage to our pavement from a storm such as occurred on Sunday would far exceed the cost of the entire protection system had it not been constructed in advance of the storm.

If these storm protection systems were only partially effective they would still be a good paying investment. In building them we have never expected that they would work with 100 per cent perfection, but have expected there would be some breaks in the various system and some damage. I am glad to report, however, that there has not been a single break in our storm protection systems to date in spite of the very heavy storms in the past two weeks.

Signs and Roadside Structures; Necessity and Methods of Control

By DR. L. I. HEWES, Deputy Chief Engineer, U. S. Bureau of Public Roads *

THE question of encroachments on the highways came before you last November at the Chicago meeting of the American Association. In a paper by Mr. MacDonald was set forth the general situation. He has since had compiled, as of January 1, 1928, a summary of the laws of the several states which regulate outdoor advertising. There has also been publicity released by the bureau on the same subject. Newspapers have given very kind and important consideration to the question editorially and otherwise. Periodicals have also warmly supported the cause of freeing our highways of dangerous and distracting signs and annoying advertisements. There now seems opportunity to come to closer quarters with this rather important subject.

Rural outdoor advertising is displayed to attract the attention of persons on public highways. There is little evidence that the motoring public desire it but it is inseparably connected with highway operation. There is nothing to show its real necessity. It has accumulated at first gradually and later in certain sections with amazing speed. It was in the beginning ignored, later tolerated, and now it must be combated with legislation and regulation. As has already been stated by Mr. MacDonald, those that benefit most by the operation of highways are the worst offenders. Motor and motor supply advertisements are conspicuous. Gas and oil signs continuously spatter your vision. Accessories, parts, and supplies march over you as you go. Cheaper hotels scream at you. Eats and drinks choke you with their loud appeal. You anxiously round a strange curve to be informed that there are "Clean Beds 500 Feet." "Bigger and Better Gasoline at Smith's!" Your rocks are red and white and blue and yellow. You can not now in many sections escape the distraction and annoyance of outdoor advertising until you turn into the quiet unimproved side road.

Improving traffic conditions is essentially an element of highway operation. Without creating separate operating divisions the state highway departments are necessarily develop-



The Division of Highways seeks to set an example of beauty in its own structures. The above picture shows the entrance yard to the district headquarters in San Bernardino.

ing the operating function. It is a function of increasing importance. We have, for example, seen the growth of the traffic lane idea and the traffic stripes which are purely operating devices. We have seen also the painted school zone warnings; the crossing warnings on the pavement; the refinement of super elevation, widening of curves, and increased radii, increased sight distance at curves and hilltops, flatter crowns and safer guardrail. These are all elements of operation. So are the state traffic counts. More so are the caution, direction, and warning signs recently standardized by the American Association of State Highway Officials. It would seem also that the outdoor advertising is for the highway departments an important element of highway operation. Outdoor advertising screams loudest on the most densely traveled roads. These are the expensive roads built and maintained and largely operated by the state highway departments. These are the roads where the operating job, already difficult, is growing constantly more difficult. These are the roads where the states are straining every effort to improve the condition of travel. These are the roads where grade crossings must be eliminated with expensive structures. On such roads we know the state departments are alive to conditions of operation. There is constantly better maintenance—dust is eliminated, detours are improving, washouts are repaired with convincing dispatch, snow is removed with con-

* This paper was presented at the annual meeting of the Western Association of State Highway Officials, at Boise, Idaho.

stantly increasing efficiency. Yet it is on these roads that rural advertising thrives and confuses the driver.

This automobile driver is distributing wealth more constantly and over a wider area than was ever dreamed of. The advertiser and the roadside merchant quickly saw the possible profit.

We are grateful for much of the roadside service. Adequate filling stations on the highway, for example. Many such stations are noteworthy examples of artistic and beautiful treatment. However, there is a descending scale of merchandising down to the hideous examples constructed of burlap and bushes, and surrounded by repulsive advertising. It is in this connection illuminating to compare the treatment of the roadside by those depending upon highway traffic patronage with the treatment by state highway and other officials.

There are noteworthy examples of roadside beautification. State highway departments have planted shrubs and trees. Massachusetts, Pennsylvania and California are noteworthy examples. States are also establishing beauty spots and state parks. State laws that prohibit outdoor advertising within specified distances of parks and playgrounds evidence an underlying desire to be free of the ugliness of it. But, the outdoor advertiser is aggressive and even bold. He has not hesitated to appropriate highway operating words such as STOP, DANGER, TURN, etc., for his own insistent purposes. He has used the U. S. route numbering too. A pickle prince planted his number on the historical battlefield of Fredericksburg. Such actions are in strange contrast to the efforts of the state highway departments to serve the owners of the highway—the motoring public now pays the bills.

An examination of the fifty typed pages of the state laws throws much light on outdoor advertising. There has been considerable progress. Forty-two states have specific statutes relating to the subject. Many of the laws are new but too many reflect conditions of the horse drawn vehicle days.

There is in the legislation much variation. No state absolutely prohibits the display of advertising within public view of the highways.

There is, in many laws, an interesting note of caution. One gains the impression that advertising along the road has acquired a vested right; that although it is objectionable and even dangerous, it must be dealt with most carefully. In fact one state makes it a misdemeanor to remove advertising signs from the right of way. Recent legislation is ob-

viously the result of motor traffic; it tends to be more stringent in the older states when traffic is densest.

Outdoor advertising may be classified for convenience as owner advertising on the premises, legal advertising by public officers, display by advertising firms, display by other advertisers (not on owner's premises). Almost universally the property owner is protected. The advertiser must, under penalty of fine, obtain the property owner's consent and usually consent from the county or town official. The owner may also almost universally display advertisements for his own product or land—only in limited instances is he restricted.

There is almost uniform recognition by the several states that the right of way of highway is forbidden ground to all except legal advertisements. Yet there are several exceptions that permit regulated display within the highways. The state highway departments have had also to remove many signs from the state highway (the elusive tin sign however sneaks over the road fence to colonize on the barbed wire property line!

There is, in the newer laws, a marked evidence of the recognition of danger at curves and at railroad grade crossings. Many state laws forbid signs along the highway within a distance varying from 300 to 1000 feet of such crossings. Some states weaken, however, and permit legal officers to tolerate signs even within the danger limit when judged not obstructive to view. This tolerance is characteristic of the caution in many laws. Obviously a driver needs his whole attention on the road and crossing signals when approaching a grade crossing. Any advertisement may distract him. Similar provisions, with similar exceptions, apply to highway intersections and sharp highway curves. The incongruity of a warning flash displaying advertisement in the right of way is similarly obvious and yet several states, apparently to escape the cost of installation, permit such warning signals—when authorized.

It would seem that highway officials could demand that the rural right of way be entirely free of any outdoor advertising whatever. To eliminate further the advertising nuisance, wider rights of way would help. Where such wider ways can not be secured, a "set back" line inside the property would help eliminate dangerous, distracting, and disfiguring signs. A combination of set back lines, say one hundred feet from the center line, and a restriction as to the maximum size of any outdoor advertising would markedly reduce the nuisance.

(Continued on page 12.)

U. S.-California Join In Traffic Study To Show Density

ON September 3d the state-wide cooperative survey, initiated by the U. S. Bureau of Public Roads and joined by the Department of Public Works began. This work is to last one year, covering 120 different localities throughout the state. The purpose of the Bureau of Public Roads in initiating this survey is to obtain authentic information as to the density of traffic throughout the six western states. Nebraska is included in the survey for comparison with the central states' condition.

In the scattered districts, twelve 8-hour counts during day periods and one night count will be taken. In the Los Angeles territory twenty-four 8-hour counts and one night count will be taken. The Los Angeles district includes Ventura, Saugus, San Bernardino and Anaheim. A count will also be made between Los Angeles and San Diego and at Jacumba, El Centro, Coachella, Banning, Victorville, Barstow and at other locations in the vicinity of Mojave and Bakersfield.

The original plan of the Bureau has provided for only 48 stations, in conformity with the work in other states. The Division of Highways has added sufficient other stations to furnish as complete information as possible for use in our study of traffic needs throughout the state.

The study has been undertaken in order that the federal government and the western states may know what the flow of traffic is throughout the year on the main transcontinental highways and on other roads in the federal-aid highway system in the west. In addition to California the highway departments of Washington, Oregon, California, Idaho, Nevada, Wyoming, Utah, Arizona, Colorado, New Mexico and Nebraska will join in the traffic survey which will extend over a period of one year.

Among the routes on which traffic will be measured are the historic Oregon Trail, over its entire length from Omaha to Portland, parts of the Santa Fe and Overland trails, and the long-distance motorbus routes from Omaha to Denver, Salt Lake City and San Francisco, and from Denver to Los Angeles by way of Santa Fe, and from Seattle to Los Angeles.

The transcontinental highways which give easy access to national parks and monuments and to national forests in the west carry a great and increasing traffic from the east and

HIGHWAY BEAUTIFICATION AS VIEWED BY EXPERT

By JOHN H. BATEMAN, Research Professor of Highway Engineering in the Louisiana State University

Rural highways should be designed and their environment developed to make them pleasing and interesting, capitalizing all the adjacent roadside scenery that may be available by developing and revealing it so that it will be readily seen and thoroughly appreciated. This involves not simply the ornamental plant along the roadsides but also the occasional removal of trees obstructing desirable vistas, the removal of unsightly objects, the obliterating of the roadside dump and the billboard nuisance, and a reasonable control of public service utilities in the erection of poles, stringing of overhead wires, and butchering of the roadside trees.

middle west, and they pass through public land states which have large percentages of unappropriated and unreserved public land, relatively low densities of population, and comparatively small revenues for road construction, and in these states federal aid has been of material assistance in closing gaps in the through routes.

In these Western States traffic has reached the point where it is necessary for the states to know the flow of traffic density, and composition on their roads, so that they can plan their highway systems on a good economic basis and plan for the removal of snow in winter.

The survey will show the number of vehicles using each of the main highways throughout the year, by days of the week and hours of the day, and the number of vehicles passing a given point at certain times of the day. It will classify the traffic according to types of vehicles, whether passenger cars, motor trucks, or motor busses, and the number of passengers in passenger cars. The importance of cities, towns, and sections of the state as the source and destination of traffic will be ascertained, and the number of vehicles from other states using the highways, and other information required by state and federal highway officials, will be obtained. The data will show population trends and will be useful in solving traffic regulation and safety problems. Surveys will be conducted simultaneously in each of the states.

OKLAHOMA—Along highways through bottom land subject to overflow, white posts are placed at intervals along the shoulders to indicate the location of the submerged pavement to drivers desiring to get through. Sometimes the 1-foot and 2-foot depths of water are marked.

SIGNS AND ROADSIDE STRUCTURES; NECESSITY AND METHODS OF CONTROL

(Continued from page 10.)

Wisconsin has an original "set back" provision for highway intersection protection:

"The triangles bounded by two adjacent intersecting highways and a line drawn between the points on the center lines—one thousand feet from the intersection of their center lines, are declared prohibited ground for the erection of any danger producing advertising signs, where such intersection is beyond the corporate limits of any city or village
* * *

Connecticut prohibits signs within 15 feet of the right of way line. Probably we can, as far as the rights of way themselves are concerned, hope for constantly tightening restrictions. Those states that now regulate only with fees and penalties have the power to be more and more severe and follow the lead of the others that have taken advanced positions.

When we consider the details of outdoor advertising on private property, we find a more difficult situation. We know that such advertising interferes with highway operations, that it mars the scenery, and that at times it is even dangerous. Wisconsin's "set back" law is significant. Massachusetts says: "The Division of Highways shall make rules for control of outdoor advertising on public ways or on private property within public view." Nevada regulates outdoor advertising on the public domain (as does Utah) and denies permit on any location which may measurably destroy the natural beauty of the scenery or obscure the view ahead or on curves, etc. Connecticut provides that: "The Superintendent of State Police may order the removal or change in location of any advertisement which obstructs a clear view along any highway." Advertising firms must there also take out a license and furnish a bond and no advertisement is allowed without specific permit.

There is sought a certain humor in some of the state laws. One state, as mentioned, penalizes the removal of advertising signs on the right of way.

Obviously our highways are, with respect to outdoor advertising, in a period of transition. A campaign of legislation is under way. There is ample evidence that much is objectionable. To free the highway for operation,

it will be necessary to scrutinize the owner advertiser more severely. The filling station must be sufficiently set back to allow the awaiting vehicle ample room off the highway. There are also encouraging reports of proposed set back stores along California highways. There can be indirect pressure brought to bear on those who persist in defacing the highways with their owner advertisements excessive in number and in area, ugly in color, silly in phraseology, and generally objectionable. The highways throughout the country are being equipped with standard warning and direction signs. These signs are for the most part scientifically located—they must not have a background of confusing miscellany of extraneous advertising. The condition of our highways with respect to outdoor advertising is not yet satisfactory and in many instances not safe; the best we can say is that we are progressing. It is possible that we may progress faster by organizing publicity. There are thousands of moving picture houses who might be willing to display suggestions that outdoor advertising on the highways is not wanted. The subject lends itself to the interest of women's clubs throughout the country. The press is already supporting the movement for cleaner roadsides. I would leave with you the thought that there is almost enough law already scattered through the books which, if selected from the acts of the various states, would change the situation abruptly. It is probably impossible to expect a law which would involve all the effective prohibitions and limitations established by the various states, but the direction in which we may progress is nevertheless well indicated. If, for example, we would eliminate all over the fence signs within 1000 feet of curves, highway intersections, and railroad crossings, and license, under bond and regulation, all other outdoor advertising, eliminate all advertising on public domain and public property, or that mars the scenery, then free the right of way entirely of signs, there would be little left about which to complain.

On the roadside merchant, we undoubtedly must use gentle but insistent pressure. He probably can be induced to beautify his surroundings. He must, without question, be induced to move his business sufficiently back from the traveled way so that there will be no interference whatever with the movement of traffic.

Jones was never an early bird at the office. One morning his boss exclaimed: "Late again! Have you ever done anything on time?"

"Yes, sir," was the meek, but prompt reply. "I purchased a car."—*Motorland*.

Experimental Road Surface Construction

By T. H. DENNIS, Maintenance Engineer

THE Division of Highways and the United States Bureau of Public Roads have recently started cooperative construction of a 10-mile experimental section of low cost type of oil-treated road surface on the Truckee River Highway between Boca and the Nevada State Line west of Verdi. The



T. H. DENNIS.

Bureau is also joining in the cost of maintaining this work for a 3-year period. The work is to be watched closely during this period and a careful record kept of both the construction and maintenance methods and cost, as well as the service obtained from the several combinations of materials. It is expected that the information to be secured will be of material benefit not only to California with her tremendous highway program, but also to all the states with similar problems who look to the Bureau of Public Roads for advice. This work should be of considerable interest to those engaged in highway construction and maintenance work and to producers of asphaltic road materials.

The work is divided into twenty sections,

each one-half mile in length. Eight of these sections will be covered with four inches, loose measure, of three-fourths inch to dust crushed rock. These eight sections are to be bound up under traffic during the coming winter and their treatment by penetration and sealing with various grades of asphaltic oil will be taken up next year. The remaining twelve sections are to be surfaced with three-fourths inch crushed rock and gravel with and without fines. This material will be bound up immediately with various grades of fuel and asphaltic oils. Two of the oil mixed sections will be sealed before winter. The sealing of the remaining oil mixed sections will be determined by their actions under weather and traffic conditions.

The Truckee River road was selected by the Bureau as being best suited for the experiment. The location provides a winter climate with snow and frost and a summer climate fairly typical of a dry region. The traffic of nearly 1400 vehicles on peak days is sufficient to be a severe test for the type of road surface. The road was constructed in 1925. In 1926 part of the section was surfaced with three inches, loose measure, of crushed rock and a portion was surfaced with a four-inch thickness of volcanic cinders. This material was oil mixed in 1927. This limited surfacing with constant maintenance has given fairly satisfactory service during the past two years, but it is now disintegrating.

BUILDING ROADS UNDER BUDGET PLAN HAS MATERIALLY REDUCED OVERHEAD COSTS

(Continued from page 1.)

cent, which indicates that the ratio of overhead to total expenditures is steadily decreasing.

Our average overhead ratio for the current biennium will approximate 3.50 per cent. Using this percentage as compared to the average overhead since the inception of the organization of 4.85 per cent, the difference of 1.35 per cent on our budget of \$60,773,490 would represent a saving of \$820,542 in overhead during this two-year period, which will go into construction work on the roads.

The successful handling of an increased volume of work and responsibility by the

personnel of the Division of Highways has been the chief factor contributing to this saving. It has enabled the absorption of a large volume of engineering work at a low overhead cost.

PROTECTING ROADSIDE FLOWERS

The West Virginia Department of Public Safety is to undertake something new in the line of law enforcement. Orders have been given to all policemen and state troopers to lend every reasonable effort to enforce the law enacted at the recent session of the legislature against the plucking of flowers along the highways. The new law, which will be a surprise to many people, prohibits the picking of flowers within 100 yards of a highway without the written consent of the owners of the land on which they grow, and transportation of wild flowers and shrubs is also prohibited. The law, which was passed at the request of nature lovers, provides a penalty of \$100.—*Highway Topics*.

San Diego Teachers College Shows How State is Planning for Future

BY GEORGE B. McDOUGALL, Chief of the Division of Architecture

THE State Normal School of San Diego was established in 1897, and the present buildings to care for about 600 students were erected on the 17-acre site. In 1921, due to added functions, the name was changed to State Teachers College of San Diego. The college now has about 1200 students and although some buildings have been added to the original 1897 group, there are approxi-



GEORGE B. McDOUGALL.

mately twice as many students as the present group of buildings should accommodate, and this leaves out of account the difference between the character and methods of the present educational program and those of the program as it was in 1897. In view of this condition the project of selling the old college and building a new one with the proceeds of the sale, and supplemental appropriations, was launched in January 1925. It had been generally approved beforehand by the State Department of Education and when proposed met with the unanimous approval of the San Diego city government, the San Diego city school department, and practically all of the civic and social organizations. A bill, modeled upon the legislation which in former years had authorized the sale of the property of the old Los Angeles Normal School and the removal of it to a new site was framed, and was introduced by Assemblyman Byron Walters of San Diego. It passed the legislature, and received the Governor's signature on May 22, 1925. Ap-

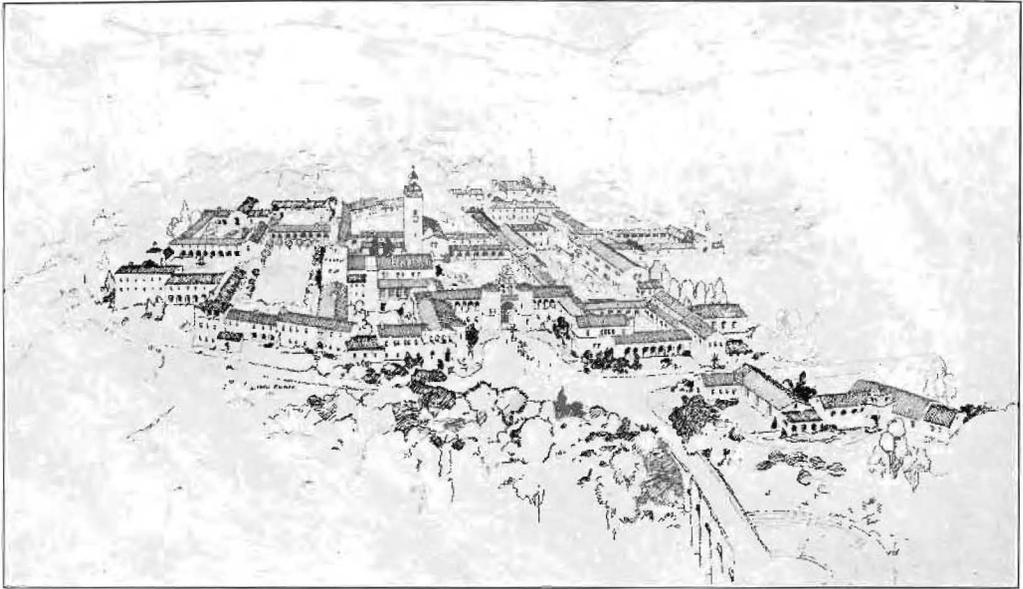
propriations were not made until 1929 for the reason that a bond issue, the proceeds to be used for the purchase of the college property, was not carried until May, 1928. Since that date strenuous efforts on the part of all of the state departments concerned and the San Diego city school department have made it possible to bring the project to its present status.

The old college property has been sold to the city of San Diego for \$325,000 and Governor Young included in the 1929 budget the sum of \$375,000, which sums taken together make a total of \$700,000 at present available for the construction and furnishing of a portion of the new buildings. In addition there is a \$25,000 1929 appropriation available for paying a portion of the cost of the construction of a trunk line sewer to serve a district of which the college campus is a small part.

A site for the new college containing 125 acres has been donated to the state by the Bell-Lloyd Investment Company and in addition Mr. Alphonso Bell, president of this company, is donating \$25,000 in cash to be used in beautifying the campus. This total sum of \$750,000 is now being expended on the basis that the first building of the college will be ready for occupancy by September 15, 1930. Contracts have been let for the academic unit. Drawings and specifications for the library and science unit are ready for bids. Drawings and specifications for the training school, shop and steam plant will be ready for bids by December, 1929. The cost of the buildings is being kept in scale with the character, functions and permanence of the institution.

The Bell-Lloyd Investment Company and Mr. J. S. Perry, owners of adjoining property, are making expenditures required to construct necessary boulevards and roads giving access to the new campus from El Cajon boulevard, which connects the college district with the city of San Diego, also together with the city of San Diego for the bringing of an abundant supply of water to the campus from the city system.

It is exceedingly fortunate that Mr. Bell attached to his most generous cash gift the condition that it be used to meet the requirements for applying landscape architecture to



Ultimate proposed plan for San Diego State Teachers College.

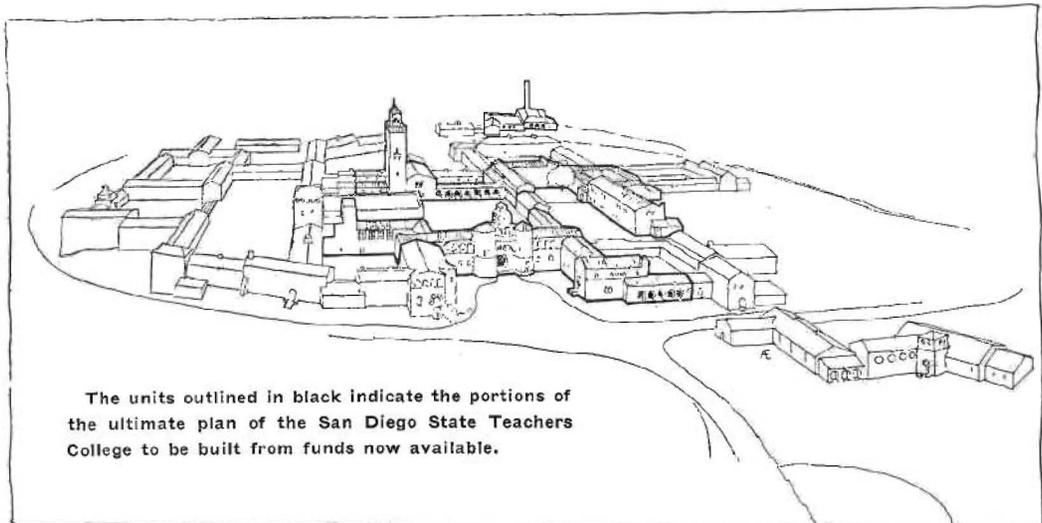
the campus. While the state recognizes the necessity of landscape architecture in connection with its institutions, demands for necessary initial building construction at new institutions in most cases absorb all the money that can be made available at the outset and improvement of grounds beyond entirely necessary roads and walks to give access to buildings has to be postponed.

The noted landscape architect, Mr. Mark Daniels, is in charge of the expenditure of Mr. Bell's gift; also of the laying out and development of the adjoining properties of the Bell-Lloyd Investment Company and of

Mr. J. S. Perry. This is most fortunate, since it will result in the coordinated treatment of the campus and of the surrounding very large properties in accordance with the highest standards of the art of landscape architecture.

The site of an institution plays so important a part in its architectural possibilities both as to plan and design, its practical and aesthetic aspects, as to make it necessary to the best results in selecting a site, in addition to consideration of location, accessibility, transportation, etc., to take into account architectural and engineering opinion regarding it.

(Continued on page 19.)



<p>Governor Urges Highway Safety Campaign</p> <p>Beautify Approaches To City</p> <p>Maintenance Crew Shows Loyalty</p> <p>Radio Set Given Prison Camp</p> <p>Widening Work Commended</p>	<h2 style="margin: 0;">Clippings, Letters and Comment</h2>  <h3 style="margin: 0;">Dealing With State Highways</h3>	<p>Non-Skid Surface Marking Highways To Aid Flyers</p> <p>State Highway Patrol</p> <p>Ban Rubbish on Highway</p> <p>Highway Contracts Show Big Increase</p> <p>Write It CALIFORNIA</p>
---	--	---

Governor Young Urges Highway Safety Campaign.

In a letter to the mayors of various cities of California, Governor C. C. Young writes as follows:

The necessity for this campaign [Highway Safety], which has my approval and that of the various state departments concerned with traffic enforcement, is indicated by the state's traffic record for 1928. During that year 1876 citizens of California, including 217 children under the age of 15 years, lost their lives in traffic accidents on our streets and highways. Many other thousands were maimed and injured.

It is my judgment that concerted and continuous action by public officials, in cooperation with this statewide and representative group, will greatly minimize the carelessness, recklessness, intoxication and ignorance responsible for this toll of human life and limb. It is a fact that California's traffic record can be favorably compared with that of many large cities and is less than in many other states. However, the loss of 1876 useful citizens should challenge the attention of all communities.

Forty or more statewide organizations have banded together in the California Committee on Public Safety to reduce deaths and injuries in this state. The committee plans an educational campaign of thirty-days' duration, to be followed by a combined program of adequate and continuous traffic law enforcement stressing certain seasonal hazards.

As you know, California has just established a new State Highway Patrol, created for the purpose of adding to the pleasure and safety of motor travel in this state. This new Highway Patrol will wholeheartedly cooperate in the present educational campaign; and, as Governor, I am writing to ask if we may not have your own whole-hearted assistance in promoting greater safety on our streets and highways, with a resultant reduction of traffic deaths and injuries.

* * * * *

Beautify Highway Approaches to Towns.

Here is some excellent advice from the editorial columns of the *Indio News*:

The approaches to towns, especially along the highways, give visitors first impressions and these impressions are very apt to remain despite anything they

see after they really get into the town itself. They argue that if the approach is neat and attractive the town is apt to be likewise and if the approach is messy and unkempt, with a lot of hot dog signs, the town is likely to be just as slipshod. The railroads learned this several years ago and they now make every effort to keep their right of way not only clean but in many instances very attractive. Any one who traveled thirty-five years ago can not help but remark the difference between the old yards and the new.

* * * * *

Desert Cloudburst Puts Heavy Task On Maintenance Forces

On September 18th, one of the desert's famous cloudbursts broke over Red Rock Canyon in Mono County about 7 o'clock in the evening, sending, according to Resident Engineer Victor E. Pearson's estimate, over 6000 cubic feet of water per second rushing down this narrow canyon. Due to the fact that the road was situated in the canyon the gravel was washed out in places and filled in at other points. All traffic was stalled for about five hours, and would have been tied up longer but for the prompt action and efficient work of Maintenance Foreman, John Callaway, Ed Monroe, and their crews. These men worked continuously with the cooperation of a force of men and machinery from the G. W. Ellis contract until the road was made safe for traffic. The crew together with Resident Engineer Victor Pearson, are to be highly commended for the spirit of cooperation, devotion to duty and efficient work performed in this emergency.

* * * * *

Radio Set Given to Prison Camp.

The Sanger Chamber of Commerce recently donated a splendid radio set to the prison road camp, now located on the Kings River lateral.

The following letter was written in appreciation of the gift:

Camp 19,
General Grant Nat. Park, Calif.
September 18, 1929.

Mr. Guy Johnson, Secretary,
Sanger Chamber of Commerce,
Sanger, California.

Dear Mr. Johnson:

Words furnish a poor medium of expression when it comes to expressing the appreciation and gratitude of the boys of this camp toward your organization, especially so toward Mr. Bacon and Mr. Brehler, for their activity and generous response in contributing such a splendid radio set to our camp.

If our "Thank You" sounds rather set, just know that it comes collectively from 120 men, who by suffering such denials, have learned that deeper sense of appreciation.

The impulse of kindness which moved the Sanger Chamber of Commerce will prove a lasting inspiration and source of pleasure to those boys who will be shut in for the winter, and the radio will bring them in closer contact with the greater outer world, and goal for which they are now preparing, and to which we all hope they will go, better and truer men.

The greatest happiness in life comes through the medium of sprinkling sunshine and happiness for others. To err is but human, and while these boys have followed questionable pursuits in life, with the necessary encouragement and proper guidance they can be led into a useful and happier life.

The spirit in which this vicinity has received a Prison Road Camp is most gratifying, and we hope to build a monument through these beautiful and inspiring mountains as a testimonial to your confidence.

Mr. Robert A. Rankin, Commissary Clerk, Division of Highways, Camp 19, will be in Sanger tomorrow and will call on Mr. Brehler, and in the event the radio is ready for delivery, he can bring it back to camp with him.

Again thanking you for your generous contribution, and extending to the Sanger Chamber of Commerce an invitation to our camp, that you gentlemen might have the pleasure of seeing our camp while still in its early stages of organization.

Yours very truly,

DIVISION OF HIGHWAYS.

By D. M. LEE, Supt.,
Camp No. 19,
General Grant Park,
California.

* * * * *

Non-Skid Surface For Ridge Route Section.

The following article is from a recent issue of the *Bakersfield Californian*:

The State of California will take a hand in taming the dangerous straight-away between Bakersfield and Grapevine Grade, wet-weather nemesis of hundreds of motorists during the last decade, it was revealed today in a message from the office of C. H. Purcell, State Highway Engineer at Sacramento. Placing a special nonskid surface over the most dangerous portions of the 29-mile stretch will begin within the next few weeks and before the rainy season starts in, Mr. Purcell stated.

A total of about six miles of the highway will be made skid proof. The sections to be treated will include the points where most of the serious accidents have occurred during past wet seasons, particularly at the foot of Grapevine Grade and farther north in the adobe sections.

Experts aver that the adobe land surrounding the highway causes virtually all of the wet-weather accidents. Dust from this land settles upon the highway and at the first shower, until the road is washed clean, this dust becomes the most slippery surface imaginable, engineers say.

Literally scores of automobiles have skidded and overturned at these points, statistics show, while untold hundreds have narrowly averted a similar fate. The accident and death toll, reported to be higher than on any similar stretch of open highway in the country, brought the necessity for action to the attention of the state and the construction which will begin soon is the result.

"The nonskid effect," Mr. Purcell says, "will be secured by covering a light application of heavy asphaltic oil with three-fourths to one-half inch crushed rock, which is following by rolling. It is hoped this type surface will tend to appreciably decrease hazards in this section for some time."

* * * * *

Widening Work Wins Commendation.

The Santa Cruz *Sentinel* comments as follows:

The California state highway maintenance crew is doing fine work on widening the highway, especially at curves on the route between Santa Cruz and Los Gatos. When the road was built it was impossible to look far enough ahead to the day when one road would fail to accommodate the traffic.

* * * * *

New Deal for the State Highway Patrol.

Says the San Francisco *Examiner* editorially:

Talking of service, State Highway Patrol Superintendent Biscailuz says:

"In case of emergency, the traffic officers will even change a tire for a distressed woman autoist."

What a change!

* * * * *

To Ban Rubbish on New Coast Highway.

The following article appeared in the news columns of the *Venice Vanguard*:

Considering the coast highway between Santa Monica and Oxnard one of the most beautiful sections of the state highway system, J. A. Stauff, who has charge of it, today issued a warning against throwing rubbish of any description on the state's right of way.

"We are determined to keep the highway clear of roadside litter which is usually to be found where so many automobiles pass, and will enforce section 150 (a) of the California Vehicle Act to do it," Stauffer declares.

The penalty for violation of this section is a fine of not more than \$500 or not more than six months in the county jail, or a combination of both.

Write it California— Not "Calif." or "Cal."

"NOT long ago," said the "Ukiah Republican Press" of August 2, "Marie Hinton Rea in 'The Press' had an editorial pleading for the use of the name of our state [California] in full, instead of abbreviating it. The article has since met a lot of approval, and this week there came to 'The Press' the following argument in rhyme from Al Utter":

I'm moved now to ask, is there any good reason
Why "Calif." and "Cal." shouldn't rest for a season?
And while these are resting let all good scribes try
"California" to write. And do you ask "Why?"
"Calif." (of Bagdad)! One thinks of a harem,
Ankle-length panties and no place to wear 'em;
These days of short skirts, eke stockings, if any,
Panties like that would look sweet on—not many.
If you use "Cal."—somewhat better reminder—
("Keep cool with 'Cal.'") and we did, that is, kind'er;
But, even at that, Cal is now quite passe;
California is not, age can't make her that way.

Marking of Highways Urged to Aid Flyers.

The following article emanates from Washington:

Air marking of principal highways as a navigating aid to flyers was urged in a statement today by Harry H. Blee, chief of the Division of Airports and Aeronautical Information, Department of Commerce. He announced that a pamphlet will be issued shortly giving proper specifications for the suggested markings.

The standard to be recommended, he said, will consist of simple markings involving in each instance the official route number preceded by the letters "U. S." in case of Federal highways, or by the state abbreviation in case of state highways. Wherever practicable, Blee said, the symbols should be lettered directly on the pavement, in white or yellow, using characters from 10 to 30 feet high, depending on the width of the paving.

The markings, he added, should read from west to east or south to north, depending on the general direction of the highway, and should be placed at all intersections and at intervals on each route of not more than 20 miles.

State Highway Contracts Show Big Increase.

The following is from the September letter of the Northern California Chapter Associated Contractors of America:

A letter has been received in the Chapter office from the State Highway Engineer Purcell, giving information upon the total amount of contracts awarded in 1928 and also for the first seven months of 1929.

From the figures below it will be noted that the contracts awarded prior to August 1st during 1929 total in excess of \$12,600,000, while the total contracts awarded during the entire calendar year in 1928 amounted to less than \$14,000,000.

Lauds Success In Obtaining U. S. Aid For Bay Bridge and Water Investigation

Under the heading "A Real Achievement," the Vallejo *Chronicle* editorializes as follows:

By far the most outstanding accomplishment of the Young administration thus far—and we can safely say that it has been marked by accomplishments—is the successful mission of Director of Public Works Meek in Washington, by which California is promised settlement of two vitally important and hitherto vexing questions—the proper advantaging of state water resources and the Bay Bridge.

It seems to us that the Governor and Director Meek have gone about this matter in an eminently proper and businesslike manner. They have aroused the interest and administrative abilities of our Engineer President and the President has manifested his interest by his usual short-cut method of procedure.

Of the two questions, the Bay Bridge may be the most spectacular and, in newspaper language, will certainly make the best "copy." It is of great importance and the people of the state have a right to an early settlement. From the standpoint of state economics, however, the water question is, and always will be, paramount.

The great valleys and cultivatable districts of California are semiarid. Production and domestic life depends upon the availability of water. Engineers tell us that there is ample water falling upon the Sierra and Coast Range sheds if all sources are developed as a part of one comprehensive state-wide plan. They also tell us that if each applicant is permitted to develop as he will each separate source, the result will be probable failure to conserve and utilize the desired maximum of available run-off, unnecessary extravagance, and inability to exploit to the fullest this particular factor among the state's resources.

We prophesy that from this act of the President, instigated by Governor Young, the greatest benefit to the state will accrue.

State Highway Contracts Let During 1928	
Roads	\$12,497,000
Bridges	1,459,000
Total	\$13,956,000

State Highway Contracts Let During First Seven Months of 1929	
Roads	\$11,445,000
Bridges	1,173,000
Total	\$12,618,000

The foregoing figures indicate that the State Department of Public Works is hitting its stride in highway work as it will be noted that the value of work let during the seven months of this year is very nearly as great as the work let during the entire twelve months of 1928.

Prosperity is the period when people run up bills that worry them during a business depression—*Detroit News*.

SAN DIEGO TEACHERS' COLLEGE SHOWS HOW STATE IS PLANNING FOR FUTURE

(Continued from page 15.)

Governor Young and the State Departments of Education and Finance recognized this, and the Division of Architecture accordingly had its proper part in the selection of the site for the new San Diego State College. This was in sharp contrast to the procedure used up to this time, where the sites of new institutions have been selected without the guidance of architectural and engineering judgment.

Upon the selection of the site, a careful survey to establish both its exact perimeter and its contours was made by the division, and was used in making a plot plan showing the ultimate group of buildings needed to accommodate 3000 or more students, to which number the Department of Education estimates the college will grow in the coming years. The plot plan also determines the locations for a stadium, play fields, tennis, hand ball and other courts, a swimming pool and outdoor theater, and for unobstrusive parking spaces for students' automobiles. The landscape architect will coordinate all of these elements with the campus roads and walks and with appropriate plantings and lawns in such a way as to give the largest artistic values to all the buildings and surrounding views. Bel-Air boulevard the main avenue of approach to the college, reaches the campus at its southwest corner, with the result that the through traffic east and west, which will be very heavy in both directions, will be diverted so as not to disturb or interfere in any way with college work and activities.

The closest cooperation between the Department of Education, the institution itself and the Division of Architecture has characterized the investigations and labors involved in finding the solution of the problem presented by this project. Very special interest attaches to the problem by reason of the fact that it involves the planning and designing of an entirely new group of buildings on a new and undeveloped site and in accordance with the most recent developments in this state of the educational unit called the teachers college.

The institution now provides and as it develops is to provide for many educational activities unknown 50 years ago. In addition to the old liberal arts curriculum, which remains as the foundation for later professional and technical studies, there are the modern collegiate curricula in such profes-

sional fields as commerce, journalism, dentistry, social service, accountancy, secretarial work and the various branches of engineering and teaching, also in the fields of Romanic languages, chemistry, history, English, physical education and art. Other branches will be added from time to time. In addition the social and "extracurricular" life of the student body will be an increasingly important element in the process of educating as carried on at the college.

In laying out the plan of the ultimate group and of the particular buildings to be erected with funds now available, the Division of Architecture has cared for all these constituent elements of this great institution under the guidance of expert educational judgment provided by the State Department of Education and by the college. All these various units will ultimately have adequate housing and be so related one to another in their positions in the various structures of the group as to make for a minimum of lost motion and the highest degree of efficiency in the conduct of the Institution.

This project may be said to be the housing of education.

Education has been said to be the embodiment of the genius, the aspirations and the compromises of a people. It is the outcome of the history of the people, their temperament, their traditions and the spirit of their institutions. Educational policies, in the United States peculiarly, have sprung into being in response to the demands of the people and the spirit of the times. The same principle applies to good architecture, one definition of which is that it has always been and will continue to be a permanent historical record of the culture of the time of its conception and execution. Because of the complexity of the fine art of architecture and since it is carried on on a large scale with great possibilities of noble effects, it is the most important of the decorative arts. Decorative art in turn is fine art applied to the beautifying of that which has primarily a useful purpose. Another description of architecture is that it is the art which so disposes and adorns the edifices raised by man for whatsoever uses, that the sight of them contributes to his mental health, power and pleasure.

The Division of Architecture in solving this intensely interesting problem is using California architecture as adapted to our conditions and uses from the lovely Mediterranean styles, and is endeavoring to record in permanent materials the love of beauty which unquestionably possesses all our people whether consciously or not.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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

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

B. B. MEEK..... Director
GEORGE C. MANSFIELD..... Editor

Address communications to California Highways and Public Works, P. O. Box 1103, Sacramento, California.

Vol. 7 OCTOBER, 1929 No. 10

September Awards Assure Heavy Major Improvements For State Highways

A total of nine state highway contracts were awarded during September by the Department of Public Works. These contracts provide for an improvement of 35 miles of highway, and for one grade crossing elimination. The contract prices total \$1,253,638.95. The following statement showing the contracts awarded and the improvement that they will secure:

MOTHER LODE HIGHWAY—A section, 2.7 miles in length, to be surfaced with untreated crushed gravel or stone, 7 inches thick. This section lies between Drytown and Amador City, on a recently built grade and mainly on new right of way. The contract was awarded to Hemstreet & Bell of Marysville. Contract price, \$27,075.

COAST HIGHWAY—A section about 3 miles in length between San Diego and Oceanside to be widened with bituminous macadam borders at intervals, together with the construction of timber curbs. Due to heavy traffic, earth shoulders are difficult to maintain next to the pavement, and hence the reason for using bituminous macadam. The contract was awarded to the R. E. Hazard Contracting Company of San Diego. Price, \$33,886.

A section 9.6 miles in length between Atascadero and Paso Robles in San Luis Obispo County, to be graded and paved with asphaltic pavement. The pavement will be 20 feet in width on a roadbed 36 feet wide. This section of the Coast Highway lies along the Salinas River and carries a heavy through traffic. The improvements will eliminate a number of bad curves with restricted vision. Steele Finley of Santa Ana is the contractor. Price, \$268,258.50.

Construction of an undergrade crossing beneath the Southern Pacific tracks near Spence in Monterey County. The structure will consist of two concrete abutments with wing walls, and grading and paving with Portland cement concrete 250 feet of approaches. This superstructure will be built by the railroad company. This subway will eliminate the present dangerous grade crossing at this place. The contract

was awarded to Triberti and Massaro of Oakland. Contract price, \$24,555.50.

PACIFIC HIGHWAY—A section of highway about 0.6 of a mile near Mt. Shasta in Siskiyou County, to be paved with Portland cement concrete 20 feet in width. This constitutes a line change. The contract was awarded to the Mathews Construction Company of Sacramento. Contract price, \$22,648.

REDWOOD HIGHWAY—A section 11.9 miles in length between Petaluma and Ignacio in Sonoma and Marin counties, to be graded and paved with Portland cement concrete and bituminous macadam surfacing 20 feet wide. This project includes several radical betterments of line and grade, eliminating a 6 per cent grade, 300-foot radius curves, and saving some 4000 feet of distance. Unsatisfactory drainage conditions are improved. The contract was awarded to Hanrahan Company of San Francisco. Contract price, \$536,795.75.

Producing and stockpiling screenings for use later as surfacing between Smith River and the Oregon line in Del Norte County, a distance of 35.5 miles. The contract was awarded to Holderner Construction Company of Sacramento. Contract price, \$35,048.

GOLDEN STATE HIGHWAY (Valley Route)—A section 5.6 miles in length between Califa and the northerly boundary of Madera County, to be graded and paved with asphaltic concrete. This contract calls for constructing a graded roadbed and widening the existing 15-foot pavement to 20 feet. Reverse curves will be eliminated and the road straightened. This contract was awarded to A. Teichert & Son of Sacramento. Contract price, \$135,636.10.

TAHOE-PLACERVILLE HIGHWAY—A section in El Dorado County between Bay View Rest and 1 mile north of Eagle Falls to be graded 24 feet wide and rubble masonry retaining walls to be constructed. This project is approximately 1.8 miles in length, and forms a portion of the Truckee-Meyers section of the Tahoe-Placerville highway. It traverses rugged granite slopes overlooking Emerald Bay. The completion of this section will eliminate numerous hazardous curves, steep grades and narrow sections. The project lies at an elevation of about 6700 feet. The contract was awarded to Nate Lovelace of Sacramento. Contract price, \$179,936.

ACCEPTANCES OF CONTRACTS

Contract of Coolidge & Scott of Adin for constructing 3 reinforced concrete bridges across the South Fork of the Yuba River on the Victory Highway at an approximate cost of \$34,500; date of acceptance, September 6, 1929.

Contract of Webber Construction Company of Crescent City covering the work of surfacing with crushed gravel between Elk Valley and Smith River in Del Norte County on the Redwood Highway, about 3.8 miles in length, at an approximate cost of \$26,800; date of acceptance, September 10, 1929.

Contract of C. W. Hartman of Bakersfield for grading and surfacing with crushed gravel, a section in Kern County on the Walker Pass Route, between Pentland and the San Emigdio road, 12.3 miles, at an approximate cost of \$96,000; date of acceptance, September 10th.

Contract of Jack Casson of Hayward for applying a bituminous treatment to the existing surfacing between Klamath River and the Oregon line in Siskiyou County, a distance of 14.5 miles on the Pacific

Licensing Forms For Contractors Are Now Available

APPPLICATION forms for contractors license under the new law are now available. Every contractor must be licensed and to operate without such license is illegal and any contract which is entered into without being licensed can be questioned. Application forms are available at every A. G. C. office, every Builders' Exchange, in the office of every city clerk and county clerk in the State of California, as well as every building department of every city and at the Department of Professional and Vocational Standards, State Capitol, Sacramento.

A conference of representatives of the construction industry with Mr. James F. Collins, the newly appointed Registrar of Contractors, was held recently in Long Beach. During

Highway at an approximate cost of \$14,000; date of acceptance September 10th.

Contract of G. W. Ellis of Glendale for grading and surfacing with oil-treated crushed gravel, between Cottonwood Creek and Diaz Lake in Inyo County on the Los Angeles-Bishop-Inyo Highway, a distance of 10.3 miles at an approximate cost of \$113,000; date of acceptance, September 16th.

Contract of C. W. Wood of Stockton for placing a bituminous macadam pavement between Auburn and Colfax in Placer County on the Victory Highway, a distance of 13.8 miles at an approximate cost of \$102,000; date of acceptance, September 16th.

Contract of Claude Fisher of Los Angeles for constructing a bridge over the Santa Clara River and an overhead crossing over the tracks of the Southern Pacific Railroad, and grading and paving roadway approaches about 3 miles north of Saugus in Los Angeles County, at an approximate cost of \$227,000; date of acceptance, September 16th.

Contract of Young Brothers of Berkeley for grading roadway at Spring Hill just north of Mt. Shasta City in Siskiyou County on the Pacific Highway for a length of road 0.7 of a mile at an approximate cost of \$35,000; date of acceptance, September 21st.

Contract of Paul M. White of Santa Monica for constructing an overhead crossing over the tracks of the Southern Pacific Railroad and a culvert near Benham in Santa Barbara County on the Coast Route at an approximate cost of \$103,200; date of acceptance, September 26th.

Contract of Southwest Paving Company of Los Angeles for grading and surfacing with oil-treated crushed gravel or stone, a section 7.3 miles in length situated between Cinco in Kern County and a point 7 miles south of that place on the Saugus-Alpine Junction Route at a cost of approximately \$78,000; date of acceptance, September 25th.

Contract of Johnson Simpson & Company of Los Angeles for constructing an overhead crossing over the Santa Fe tracks and a culvert at Irvine in Orange County on the Coast Route at an approximate cost of \$60,800; date of acceptance, September 25th.

this conference the application form, the license form and other administrative features were approved by those present.

The application form approved is in strict accordance with the provisions of the law and on it provision is made only for the information required under the act.

Under the law, Mr. Collins is the registrar charged with the administration of all provisions of the Contractors' License Law. He will be required to prescribe the application form, issue the license, issue renewals, investigate and act on all complaints filed under the law, suspend and revoke licenses and otherwise carry out the law's provisions. His main office will be at Sacramento but he will have branch offices in San Francisco and Los Angeles.

Commenting on this conference, the September letter of the Northern California Chapter, Associated General Contractors of America, says:

"Those who were fortunate enough to be present at this meeting, left with very great satisfaction in the knowledge that Governor Young has appointed a Registrar of Contractors whose experience, qualifications, judgment and personality admirably fit him for this particular administrative work.

"It was very evident that since his appointment Mr. Collins has given very thorough study to the Contractors' License Law, and will administer it in a way which will protect the industry, but at the same time discourage any unjust complaints against contractors."

CORRECTION OF ERROR

In the September issue of CALIFORNIA HIGHWAYS AND PUBLIC WORKS, there appeared on page two a cut captioned "Melones Dam on the Stanislaus River." The caption was in error and should have read "Exchequer Dam, built by the Merced Irrigation District, on the Merced River."

A quaint law was passed in England in the middle ages relative to the muddy and rutted highways of the day. According to the law bushes and trees were felled for 200 feet on either side of a road to prevent the gentle inhabitants of the country from rushing out and attacking travelers! The first toll for the maintenance of English roads was passed by Edward III in the fourteenth century.

In the interests of safe and sane driving we would point out that you are not so likely to lose control of your automobile if you keep up your payments. And buying a closed car is not necessarily saving for a rainy day.

This Is Massachusetts Plan For Beautifying Its Roadsides

TO OBTAIN the best results in roadside planting, individuals entrusted with such work should have a wide knowledge of vines, shrubs, and trees, says James H. Taylor, highway landscape supervisor of the Massachusetts Department of Public Works, writing on progress in roadside planning in the August issue of *Public Roads*, a bulletin of the Bureau of Public Roads, U. S. Department of Agriculture. They should know the height and spread of the planting at maturity, and its possibilities of contrast in shape, texture, and color with other planting, and also they should know what the planting looks like at different seasons of the year, and when and how to plant and how to care for all kinds of roadside development, he says:

"We are educating a small army of men whose primary interest is in the road surface and whose natural attention is to lines and grades, 'pot holes' and breaks, tar barrels and side drains, and interesting them in vines, shrubs, and trees and the aesthetics of the roadside," writes Mr. Taylor. "Responses differ as men differ; the result is not uniform but the general tone is one of splendid cooperation.

"Depressions in the road surfaces are known to the road maintenance man as 'pot holes.' The roadside developer detects what may be called pot holes in the highway landscape and corrects the situation, sometimes by filling in and sometimes by removing detracting or barrier material.

"All roadside pictures exist in three parts—foreground, middle-distance, and background. The planter must know the dimensional limits and contrastual possibilities in shape, texture and color; bark, leaf, and flowers. He must know the spring aspect, summer maturity, autumn glory, and winter value; in other words, he must have a complete knowledge of growing things.

"Trees carefully planted and cared for grow but tend to become topheavy with foliage. This requires intelligent removal of enough of the tops to give them a chance to resist wind pressure, not by mere shortening of the terminals, which produces four or five sprouts instead of one, but by the removal of

entire branches, cutting them off at the outer edge of the collar of the limb. Proper pruning leaves the tree symmetrical.

"In Massachusetts, three tree crews are kept in operation throughout the year, each crew consisting of a tree agent and three men. Two of the crews are equipped with a camp wagon—a small house on wheels—fitted to house four men comfortably.

"Plantings, in the main, are confined to new right of ways, since their widths of 60 feet or more allow greater opportunity for landscape development. Such locations assure a reasonably undisturbed future, but it is a rule in every case to plant as near the property line as possible."

The planting procedure, says Mr. Taylor, is as follows: A blue print showing the right-of-way lines and road location is sent to the Palmer station, where the state nursery is located. The designer makes a study of the road and indicates the proposed planting on the blue print. The locations of plants or trees are then staked and the pits dynamited, dug, and where necessary refilled with the best loam obtainable. Tree pits are 3 feet in diameter and 2 feet deep. The planting order is filled by the state nursery, packed on trucks and trailers, and set out in the field. A space 3 feet in diameter around each plant is grubbed and kept free from weeds, and water is supplied if needed. After the planting is well started it is given a final inspection and turned over to the district maintenance forces for care.

"Trees should have constant and thorough inspection," says Mr. Taylor, "for it often happens that a tree presenting a fair face to the road is merely a shell from the other side and is ready to fall with the first strong wind. Dead trees and limbs deface the picture; they are a menace to traffic and should be removed at once."

Saint Peter scanned the latest applicant for admission to the pearly portals.

"What did you do on the earth?" he asked.

"I was a truck driver," said the applicant.

Saint Peter jumped several feet into the air. "Open the gates, boys!" he shouted. "Give this fellow the right of way."

New Law Big Aid In Keeping Highways of State Attractive

CLEANING UP and improving the appearances of highways is being made more effective by the State of California through a law now effective prohibiting fruit, vegetable and other peddlers from using state highways for the sale of their wares.

This enactment, which is designed to provide further for the care and protection of the highways, was added this year by the legislature. The new section of the statute reads as follows:

"SEC. 7½. Any person who sells, displays for sale, or offers to sell any merchandise, fruit, vegetables, produce, food, or any other goods from any vehicle, motor trailer, semitrailer, wagon, push cart, stand, structure, or building standing or situated wholly or in part on the right of way of any state highway, or any part thereof, is guilty of a misdemeanor. Nothing herein contained, however, shall be deemed to prohibit a seller from taking orders for or delivering any commodity from a vehicle on the part of the right of way of a state highway immediately adjoining the premises of the purchaser. It shall be the duty of all peace officers and state traffic officers to enforce the provisions of this section."

HIS JOB IS TO SEE THAT DAMS ARE SAFE

(Continued from page 6.)

by storage, so that dam building will increase rather than diminish, both in the size and number of dams. It is, therefore, imperative that the responsibility for the supervision of dams in the state be placed under centralized authority. I feel that in placing Mr. Hawley in charge of the supervision of design and construction of dams the state has secured the services of a man eminently qualified to carry on this work, and that every effort will be made by him in supervising dams to the end that the people of California may be assured rigid enforcement of the provisions of the act making for the safety of dams."

PREQUALIFICATION OF BIDDERS

The last legislature passed the law signed by Governor Young requiring the licenses of contractors on public work. The Division of Highways has prepared a questionnaire for submission to contractors and is now working out a procedure for prequalification. This has been done in conjunction with the Association of General Contractors of America and the surety companies' association, the purpose being to work out a plan that will be satisfactory both to the state, the contractors and the surety companies.

THE GROWTH OF MOTORING IN CALIFORNIA

(Continued from page 4.)

The accompanying tables show the growth of motoring by county in California for 15 years. It is interesting to note that not a single county shows a loss in motor vehicles although several of the mountain counties have suffered material losses in population. Los Angeles County offers a fairly good example of the growth in 15 years, the total in 1914 being 43,099 as compared with 755,775 for June 30, 1929.

County	January 1, 1914	June 30, 1929
Alameda	8,449	123,166
Alpine	9	68
Amador	165	2,246
Butte	1,019	13,756
Calaveras	155	2,301
Colusa	425	4,287
Contra Costa	930	22,734
Del Norte	56	1,621
El Dorado	154	2,745
Fresno	4,488	55,351
Glenn	490	5,263
Humboldt	994	13,815
Imperial	1,515	20,709
Inyo	187	2,682
Kern	2,521	33,556
Kings	870	9,289
Lake	168	2,994
Lassen	131	3,942
Los Angeles	43,099	755,775
Madera	343	5,758
Marin	686	10,303
Mariposa	44	1,175
Mendocino	463	7,082
Merced	634	13,156
Modoc	136	2,414
Mono	12	394
Monterey	892	17,247
Napa	687	7,434
Nevada	169	3,094
Orange	3,761	46,145
Placer	437	8,383
Plumas	98	2,133
Riverside	2,128	29,251
Sacramento	3,419	43,542
San Benito	328	4,335
San Bernardino	3,198	44,404
San Diego	5,965	70,697
San Francisco	12,081	142,321
San Joaquin	2,500	36,864
San Luis Obispo	661	11,061
San Mateo	1,258	22,161
Santa Barbara	1,796	22,613
Santa Clara	3,941	52,028
Santa Cruz	986	13,984
Shasta	340	4,832
Sierra	64	750
Siskiyou	379	8,093
Solano	848	12,437
Sonoma	1,913	24,785
Stanislaus	1,791	24,287
Sutter	333	5,826
Tehama	428	5,471
Trinity	20	542
Tulare	2,412	30,571
Tuolumne	248	3,072
Ventura	1,410	20,561
Yolo	798	9,028
Yuba	324	4,908
Totals	123,516	1,859,523

ARIZONA—A proposed new highway recently surveyed through the northwestern part of the state would reduce by 70 miles the traveling distance between Kingman and Las Vegas, Nevada, and would connect with the proposed Black Canyon Dam across the Colorado River.

A Plea For Beautiful Highways

By RAY LYMAN WILBUR, Secretary of the Interior

WHEN Daniel Boone made his celebrated trip out to the wilds of Kentucky he must have gone through a magnificent forest as he followed the game and Indian trails. He traveled at a rate slow enough to enjoy the green fields and the clear streams, the beautiful animals and the flashing birds, the bright flowers and the gay butterflies. We can understand why he brought back those glowing tales which stimulated the great migration over the mountains to settle the Ohio River country.

Now a traveler speeds along on the railroad or on a fine highway and often is more impressed by the ugly back yards, the smoke-stained shops and factories, the turbid rivers and the cheap frame we have built around our highways than by the beauty of the landscape. The great forest is gone. In some places we are trying to get it back again. But nearly everywhere there could be beauty of plant and tree and attractive homes and fertile farms. In many places there is great charm, but the buildings and other things near the highways block the vision.

It is like having a cinder in your eye. Even the Royal Gorge is disappointing to a man busy with something in his eye. America is so beautiful, but man has done so many things to it that it often looks its best after a fresh fall of about six inches of snow. We have been in too big a hurry to cut things down

and to cut them up, to build fast and without much thought and to make money with a rush.

We now have settled up the whole country from shore to shore and can now quietly go about the task of making the most of what we have left and of building for the future. We can afford to spend some time and effort in making things look better. Why not stop living so much of the time in the midst of bewildering signs, tawdry buildings, weeds, waste paper and old cans? There is a movement on for attractive wayside stands, harmonious with their natural surroundings. Trees are in the nurseries ready to plant, flower seeds are cheap, exercise with a hoe is just as healthful as golf, and your neighbor can enjoy your garden with you if your hedge is not too high.

Our country has become our common possession from the standpoint of beauty or lack of it. A little gasoline takes us wherever the roads go. If we can all get interested in a beautiful America we will become a different people and we can all enjoy again those natural charms that quietly but effectively influence our character and thinking. I am afraid we will have to expect most in this direction from our children. Too many of the old folks have become accustomed to disorder and grime and cheap junk architecture. The children of today have to live in the world of tomorrow and they might as well work to make it more livable.

Assistant Superintendent of Highway Patrol Named

H. Roy Youngblood, undersheriff of San Joaquin County for the past 18 years, has been appointed assistant superintendent of the California Highway Patrol. He will assume his new duties on November 1st.

The Stockton *Record* editorializes on Mr. Youngblood's appointment as follows:

"The appointment of Undersheriff H. R. Youngblood to the office of Assistant Superintendent of the California Highway Patrol will meet with the approval and pleasure of his many friends in San Joaquin County.

"As secretary-treasurer of the California Sheriffs' Association for several years, Mr. Youngblood won a high place for himself in the esteem of the peace officers of California. He has proved himself loyal and efficient in the performance of all his duties in connection with that office and there is every reason to believe that as assistant superintendent of the California Highway Patrol, he will add to the laurels he has won as an official of the California Sheriffs' Association."

IOWA—Pavement projects recently completed have cost an average of \$26,184 a mile. Costs for various items were reported as follows: aggregate, 13.2 per cent; cement, 22.4 per cent; reinforcing steel, 3.5 per cent; freight, 21.1 per cent; grading, 7.7 per cent; miscellaneous contractors' costs including profits, 26.2 per cent; engineering and other charges, 5.9 per cent.

Irrigation
Dams
Reclamation
Flood Control

Review of September Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

Water Rights
Snow Survey
Water Resources
Investigation
River Flow

IRRIGATION DISTRICTS

The revision of the California Irrigation District Laws to conform to the amendments made by the 1929 Legislature has been completed and is now in the hands of the State Printer.

In the matter of the request of the Buena Vista Water Storage District for the validation of its bond issue in amount of \$942,731.11, action of the California Bond Certification Commission has been withheld pending certain adjustments to be made satisfactory to the State Banking Department.

The California Bond Certification Commission has concurred with the State Engineer in his recommendation that the request of the Ladera Irrigation District for the approval of a bond issue in the amount of \$200,000 be denied.

The California Bond Certification Commission has acted favorably upon the request of the Nevada Irrigation District that the district be permitted to expend from its construction fund \$6,201.26 for emergency work in the district.

DAMS

Copies of the rules and regulations and application forms have been mailed to the owners of 442 dams. Arrangements have been made to place these papers in the hands of the owners of 93 additional dams through a representative in the field. Notices were sent to the owners of all dams known to be under construction on August 14, 19 in all, which were less than 90 per cent completed on that date.

Inspections have been made of all dams under construction. These include the Salt Springs Dam on the Mokelumne River, a rock fill dam being built by the Pacific Gas and Electric Company which will be the largest rock fill dam in the world and the San Gabriel Dam of the Los Angeles County Flood Control District.

Further consideration has been given to Lake Hodges dam by the consulting board appointed for that purpose. A consulting board has been appointed to consider problems at the Juncal site on the Santa Ynez River because of difficulties arising from the geological conditions at that site.

An engineer has been assigned to work in Lassen and Modoc counties, where about one-seventh of the dams in the state are located, to determine the ownership which is unknown in many cases, make inspections, and assist in the preparation of applications. It will also be necessary to secure a great deal of statistical data, as it is known that this is very meagre at present, especially in regard to drainage areas and necessary spillway capacity.

The sites for two new dams, Mud Springs and Wrigley, were inspected, and inspection made of the following dams now under construction: Salt Springs, Chenery, Lyons, Calaveras (3), Spicer Meadows, Pickering, Crouch, Skye Valley No. 2 and No. 3, Burbank Reservoir No. 5, Glendale Park Manor, Felt Lake, Sunset, Juncal and Ridgewood.

Inspection was also made of the following old dams: Heeney, Carson River, Burney Creek, Catalina Island and Burbank Reservoir No. 4.

Early in September there was a partial failure of a small dam of the city of Burbank, which as a city-owned dam, had not been previously under the jurisdiction of the division. Inspection was at once made. Burbank reservoir No. 4 is a storage of about 7,000,000 gallons capacity built by excavating a basin in a small canyon above the city, closing the lower side by an earth dam, and lining the whole basin with concrete, and covering the whole with a roof. A leak developed through some portion of the lining or through some of the joints. This water found its way to a hole or weak strata under the northerly portion of the embankment, and when it was discovered about 10 a.m. September 7, a considerable flow was emerging. This developed to a maximum of about two cu. ft. per sec., and eroded a hole under the embankment about one foot in diameter. The lining against the embankment cracked in several places, but did not collapse, although a large hole was eroded at one point back of the lining. All the leakage that occurred escaped through the cracks in the lining. At 10.30 a.m. the waste gate from the reservoir was opened, and by 4.30 p.m. the reservoir had been drained. The city is making a complete survey of conditions prior to preparing an application for repairs. No lives were endangered, and no property damage was suffered with the possible exception of a small amount of erosion at back of a partially improved lot.

RECLAMATION AND FLOOD CONTROL

Maintenance of Sacramento and San Joaquin Drainage District.

The irrigation of willows planted for the protection of the east levee of the by-pass has been continued. Two small crews have been placed at work clearing out brush and second growth in the Tisdale, Sutter and Butte Slough By-passes. The Sacramento River revetment at Freeport, Project No. 5, has been cleared of weeds and willows and several washes along the inside of the piling have been filled.

Remember, girls, in seeking your model husband, there are two models, sport and working.—*Council Bluffs Nonpareil.*

Emergency Flood Control and Rectification of River Channels.

Tentative arrangements have been made to cooperate with Reclamation District No. 532 in bank protection construction at the junction of Georgiana Slough and Mokelumne River. The cost of the work will be approximately \$3,000.

Surveys have been completed and plans are in preparation for protection works on the Feather, near the Nicolaus Bridge, in cooperation with Sutter County. Thirteen thousand dollars is available for this work.

Surveys have been completed and plans are in preparation for bank protection work immediately below Isleton, on the Sacramento River.

Landowners of Butte County desire the cooperation of the state in providing rectification works on the Feather River at Robinson Bend, above the Gridley road. It is reported that Butte County has appropriated \$4,000 for this work, and it is expected that arrangements can be completed shortly to proceed if a feasible plan for the work can be found. The landowners are also making an attempt to interest the California Debris Commission in this work.

Sacramento Flood Control Project.

The Reclamation Board on August 21 requested the Department of Public Works to undertake clearing work in the Feather River channel and in the by-passes of Project No. 6, in accordance with plans approved by the board. The estimated cost is \$92,558. At the meeting held on September 18, the Reclamation Board passed a resolution which will make the funds available and permit the work to proceed.

Surveys have been made and plats and descriptions have been completed for the rights-of-way necessary for the West Intercepting Canal, a portion of the project to be built by the California Debris Commission.

Plans are being prepared for submission to the Reclamation Board for the clearing of the channel of the American River from the "H" Street Bridge to the Southern Pacific Bridge, as a part of the flood control construction program approved by the Reclamation Board. This will involve the removal of approximately 1200 piles and other obstructions. Money is available for this work, and it will be handled in the same manner as the clearing mentioned above.

The Reclamation Board has authorized this office to construct a road approach to the top of the east levee in Sutter County, in accordance with an old right-of-way agreement. The cost of this will probably not exceed \$300.

Russian River Jetty.

The construction of the jetty at the mouth of the Russian River, near Jenner, has been proceeding satisfactorily since the work was taken over on August 16. The work of driving piles in the jetty structure is nearly completed, so far as it is proposed to carry it this season. All equipment for the railroad and quarry is now in operation and rock is being placed in the jetty. A short railroad trestle is being constructed, so that the railroad can be placed on a high sand bar instead of the low sand spit, to prevent the road being washed by heavy rollers and to permit the delivery of rock continuously. The work will be carried on as late in the season as the weather will permit.

Pajaro River Flood Control.

The counties of Santa Cruz and Monterey have each appropriated \$1,000 for work in the Pajaro River, in

accordance with the provisions of Chapter 524, Statutes of 1929. This will make available for immediate use a fund of \$4,000, which it is proposed to expend in further clearing the channel of growth and obstructions, which was commenced last year when a total of \$7,500 was spent on the work.

Fish and Game Commission Work.

No work has yet been done toward the construction of the jetty at the mouth of the Navarro River, as the question of right-of-way has not been settled. Progress on the construction of the channel at the mouth of the Salinas River is being held up for the same reason, pending a decision from the Attorney General in respect to this right-of-way.

WATER RESOURCES INVESTIGATIONS

Organization.

Considerable time and effort has been spent in effecting an organization for carrying forward the Water Resources Investigation provided for by the Legislature of 1929. Civil Service examinations were held the latter part of July and the first part of August. List of eligibles was available the latter part of August. A number of men have been employed during the past month.

San Joaquin Valley Investigations.

Two survey parties were put into the field September 9th to make a topographic survey of possible reservoir sites on the North Fork of the San Joaquin River above the mouth of Big Creek. It is expected that five or six weeks will be required to complete this work.

The compilation of records on about 3500 wells covering a period in some instances of ten years in the southern San Joaquin Valley is in progress. Elevations of these wells referred to U. S. G. S. datum have been determined by the various districts in this area in cooperation with this division. This work is complete.

The classification of the lands in the San Joaquin Valley south of the Merced District and Patterson has been completed and reports rendered thereon.

The crop survey is being continued.

Preliminary office studies are in progress to determine the economic size, grade and location of exchange canals from San Joaquin River to Kings River and from Kings River to Kern County. It is planned to place a survey party in the field before the end of the month for the purpose of laying out these canals.

Water supply studies of the major streams have been completed and studies are in progress to determine the yield of the unmeasured areas.

Sacramento Valley Investigations.

A survey has been completed in Indian Creek on Feather River downstream in Indian Valley for the purpose of locating the most feasible and economic dam site. A geological examination has been made and a report rendered thereon. Geological examinations have also been made of the Baird dam site on the Pit River; Iron Canyon and Keswick dam sites on the Sacramento River; Fairview and Lewiston dam sites on the Trinity River and Whiskeytown dam site on Clear Creek.

Office studies are in progress, some of which are complete, to determine the utility of five reservoir sites on the Upper Feather River for irrigation and power in the statewide plan of water development.

Extension of the water supply estimates for the Sacramento Valley streams from 1925 to 1929 is in progress. Seasonal indices of wetness for the several precipitation divisions in Northern California have been calculated for the same period.

Salinity Investigation in Upper Bay and Delta of Sacramento and San Joaquin Rivers.

The investigation to determine the facts on salinity conditions in the Upper Bay and Delta of the Sacramento and San Joaquin rivers has been continued throughout the month. Salinity samples have been taken at four-day intervals at the 74 regular observation stations and at more than one-third of these stations samples have been taken at both high and low high tides.

To determine the variation of salinity content of depth and tidal stage a total of eight special salinity surveys have been made at eight stations during the month. In addition to these a total of ten special salinity surveys were made at cross-section stations at Antioch and Collinsville. These surveys involved the sampling, at various depths at three predetermined points, at each station and also velocity measurements at the various points of sampling through a complete tidal cycle.

Seventy-five miles of levels tying in the tide gages which were established have been completed. These levels have been referred to U. S. G. S. datum.

Stream flow measurements to determine the distribution of flow among the tidal channels for various stages on the Sacramento and San Joaquin rivers have been continued. Five measurements have been made on Three-mile Slough; one on Georgiana Slough; one on Sutter Slough and on Steamboat Slough; and one on Sacramento River below Walnut Grove, a total of nine measurements. These measurements in each instance were carried through a complete tidal cycle.

A total of about 4500 salinity samples have been obtained during the past month and are being analyzed by the laboratory of the Highway Commission.

Southern California Investigations.

Field work in connection with the Southern California Water Resources Investigations has been undertaken in the Mojave River Basin in cooperation with the water resources branch of the United States Geological Survey, and additional stream flow gaging stations are being established to cover all major streams in southern California.

WATER RIGHTS

Applications to Appropriate.

During the month of August, 35 applications to appropriate were received, 22 were canceled, 22 were approved, and 7 were revoked.

Snow Survey.

Rapid progress is being made and splendid cooperation is being experienced on the part of the U. S. Park Service, the irrigation districts and the power companies in establishing snow survey courses. It is expected that all major stream basins of the Sierras will be covered to greater or less extent in the work this year—some of the basins quite intensively.

Sacramento-San Joaquin Water Supervisor.

Sacramento River flow reached a minimum stage of approximately 2350 second-feet at Sacramento early

in August and started a rather rapid rise about September 1st. The minimum flow in 1924, which is the lowest of record was approximately 700 second-feet, and the minimum flow in 1927 which was the highest since 1924, was approximately 3500 second-feet.

MOTOR VEHICLE DIVISION REPORTS

FRANK G. SNOOK, Chief

LAW ENFORCEMENT

The following statement shows the activities of the Law Enforcement Bureau of the Division of Motor Vehicles for the period from January 1, to July 31, 1929:

Motorists stopped by traffic officers of 49 counties—113,941.

Reasons for above action—

Speeding	13,378
Light infractions	52,182
Violating "Rules of Road"	12,809
Violations in operation of trucks.....	9,151
Miscellaneous offenses	26,331

Total

113,941

Number of arrests—53,512.

Charges—

Driving while drunk.....	516
Reckless driving	1,458
Speeding	7,765
Defective lights	31,818
Operating trucks illegally.....	1,202
Various other violations.....	4,966

Total

53,512

Disposition of the 53,512 arrested shows that 12,366 were fined by the courts, and their fines total \$281,001.66. Reports show that 15,460 cases have been dismissed.

In addition to the above, the county traffic offices collected \$38,330.55 in delinquent fees on motor vehicles, and \$165,290.90 for the regular registration of motor vehicles. The sum collected for regular registrations is collected chiefly at the renewal period, while that which represents delinquent fees is collected throughout the year while patrolling the highways and checking trucks for overweight and other violations.

The total mileage covered by the officers from January 1, to July 31, 1929, is 3,138,794.

During this period the traffic offices passed 132,916 applicants for operator's licenses, and rejected 5270 for various reasons. 85 stolen cars and 391 abandoned cars were recovered for this period.

CALIFORNIA HIGHWAY PATROL

During the early part of September, E. W. Biscaiz, Superintendent of the California Highway

Patrol, delivered new cars, which were painted the distinctive color "white," to all state inspectors for their work. Plans are being formed that will enable the Division to have the motor equipment of all traffic officers painted this color in a short time. This distinctive color of equipment will be a great help to the Division in enforcing the act, and will relieve the feeling of the public that it has been impossible to tell an officer from any other individual when riding in a motor car.

During the above period the Division of Motor Vehicles received reports from traffic offices of 49 counties. Up to August 14, 1929, there were four counties, namely, San Francisco, Santa Cruz, San Bernardino and Los Angeles, that operated as charter counties and did not make reports to this office. The following counties, Trinity, Sierra, Alpine, Mono and Inyo, do not have a traffic force. In the 49 counties reporting there are 264 captains and patrolmen and 25 clerks.

REGISTRATION

Relative to the activities of the Division in connection with registrations ending August 31, 1929, there are 1,929,496 fee paid registrations and 33,838 exempt registrations, or a total of 1,963,334. The total fees collected are \$9,570,205.93. The Division has issued 50,917 nonresident permits.

STATE HIGHWAY WORK OVER STATE

ALPINE COUNTY

The highway between Markleeville and Woodfords is being widened and surfaced. The Camino Construction Company is doing the widening. State forces are doing the surfacing.

AMADOR COUNTY

J. P. Holland's contract for grading 2.7 miles between Dry Town and Amador City, a portion of the Mother Lode Highway in Amador County, is practically complete. A contract has been awarded to Hemstreet & Bell for rock surfacing this job. This work will start shortly.

The Mother Lode Highway between Plymouth and Cosumnes River will soon be reconstructed practically throughout. J. P. Holland has the contract on the final portion.

BUTTE COUNTY

Work is progressing favorably on the contract between Oroville and Feather River, a distance of 4.4 miles, Ariss-Knapp Company, Contractor. This is the first unit of the Oroville-Quincy highway which, when completed, will be one of the most scenic roads in the state highway system, and which will make a large

mountain region easily accessible to tourists, hunters and fishermen.

Camp No. 17, located on the Feather River about 8 miles above Oroville, is at present manned by 119 convicts and 19 free men. The project on which the camp forces are engaged is another unit of the Feather River Highway between Quincy and Oroville and will be available for local traffic as soon as the bridge across the Feather River at the westerly end of the unit and the grading unit under construction by the Ariss-Knapp Company, between that point and Oroville, are completed. Approximately 3½ miles of this unit have been completed. The work is of a very rugged, rocky nature, but progress is very satisfactory.

CALAVERAS COUNTY

The grading job between Mokelumne Hill and San Andreas has just been completed by the Gabler Construction Company. This contract is on the Mother Lode Highway and eliminates the worst section of the road between the above towns. Bids will be opened September 30th for surfacing this stretch with gravel.

The new road at Black Springs on the Big Trees Highway will soon be completed. This construction is being handled by Superintendent J. H. Gates and will eliminate the old grade to Black Springs.

COLUSA COUNTY

The plans and estimates for constructing 15.6 miles of highway from Abbott Mine, Lake County, to Salt Creek Canyon, part of the Ukiah-Tahoe Highway, have been completed, and provide for a 24-foot roadbed. It is anticipated that the work as far as Bear Creek will be done by convict labor forces continuing the work done in Lake County by the same labor forces.

A contract has been awarded to J. E. Johnston for placing bituminous macadam surfacing on existing pavement and constructing rock borders on each side of the existing pavement between Geneva (Berlin) and a point 2.6 miles northerly. Work will be started soon.

DEL NORTE COUNTY

The Holdener Construction Company, who have the contract for oil surfacing 35 miles of Redwood Highway from the Oregon Line to the new Hiouchi Bridge over Smith River, have practically completed the work.

The Holdener Construction Company also have the contract for producing and stock piling approximately 5700 cubic yards of crushed rock for a light bituminous surface over the 22 miles of the Roosevelt Highway in Del Norte County, between Crescent City and the Oregon Line. The rock produced under the contract is being used by state forces in placing the bituminous surfacing. There is approximately 3 miles more to be completed.

The Webber Construction Company have the contract for constructing a small, two-span concrete girder bridge over Hardscrabble Creek, approximately 6.68 miles east of the Hiouchi Bridge over Smith River. The work is practically complete and it is expected that the new bridge will be in use in the near future.

The Webber Construction Company have completed the placing of additional crushed rock surfacing over 4 miles of highway between a point 5 miles east of Crescent City and the new Houchi Bridge over Smith River, on the Redwood Highway. They have also stock piled sufficient crushed rock for placing a 2-inch by 20-foot bituminous macadam surface over the entire 4 miles.

J. C. Compton of McMinnville, Oregon, is the contractor for placing the 2-inch by 20-foot bituminous macadam over the above named section and the work is now in progress, approximately one mile of the macadam being completed.

J. E. Johnston, who has the contract for grading and surfacing the Redwood Highway between Klamath River and Wilson Creek, has practically completed all the grading and surfacing work and the road is open to public travel throughout. He is now completing the necessary protection work along the ocean shore, near the northerly end of his contract. It is expected that the contractor will have this work completed in the very near future.

J. E. Johnston also has the contract for grading and surfacing between the southerly Del Norte County Line and the Head of Richardson Creek, a point 2 miles south of Klamath River. The work has been completed except for the completion of a small amount of drainage work.

The Webber Construction Company is stock piling rock at the Head of Richardson Creek, 2 miles south of Klamath River, for reinforcing the base between the Head of Richardson Creek and Klamath River. It is expected that this rock will be placed during the late fall.

EL DORADO COUNTY

Grading of 5.1 miles of the Lincoln Highway along the south shore of Lake Tahoe (Mays Station to the Nevada State line) is being done by L. W. Hesse, Contractor. The road will be constructed 36 feet wide with no sharp curves nor steep grades. Contract is progressing satisfactorily and will be completed before winter.

From Folsom to Placerville, construction of oil-treated rock borders is in progress and is scheduled for completion December 7, 1929. The improvement is designed to correct the present narrow pavement and extremely sharp curves by placing the 3-foot rock borders which will give a paved 18-foot traveled way, and will render this portion more capable of traffic demands to which this route is subject. Further improvement will be gained by superlevating curves with oil-treated material and constructing additional width on the inside of curves to effect alignment correction where possible. This contract was awarded to W. H. Larson and is financed from the State Highway Maintenance Fund.

Between Riverton and Kyburz on Route 11 the grading of 5.75 miles is in progress. As a Forest Highway, this is a cooperative project to which \$140,000 was subscribed as the state's share. This contract was awarded to G. E. Finnell and is under the supervision of federal engineers.

Between one mile north of Eagle Falls and three miles south of Meeks Bay, state forces are improving drainage conditions and placing disintegrated granite surfacing. The work is well under way and will be completed soon.

HUMBOLDT COUNTY

The Webber Construction Company received the contract for producing and stock piling bituminous macadam rock along the Redwood Highway for a 20-foot by 2-foot bituminous macadam between a point one mile south of Orick and the northerly Humboldt County Line. The rock as yet produced is not sufficient to permit the starting of the placing of the macadam surfacing, but it is expected that the rock will be out in time for the contractor to place the macadam surfacing during the late spring of next year.

The Engelhart Paving and Construction Company have a contract for placing additional surfacing and stock piling rock for bituminous macadam pavement on approximately 3.3 miles of the Redwood Highway between Big Lagoon and Orick. The stock piling of the bituminous macadam rock is practically complete and the surfacing is under way.

Kern & Kibbe have the contract for placing additional crushed rock surfacing over 4.3 miles of the Redwood Highway from Trinidad southerly to Little River and for stock piling rock for bituminous macadam pavement over the same distance. The surfacing has been completed and the stock piling of the macadam rock is approximately one-third complete.

W. C. Elsemore has completed approximately one-third of his contract for producing crushed rock for bituminous macadam pavement between Mill Creek and Little River, a distance of 6.4 miles.

Heafey-Moore Co. of Oakland have the contract for placing the bituminous macadam over the entire roadway between Mill Creek and Trinidad, a distance of 10.7 miles. The work is well under way for placing the macadam between Mill Creek and Little River. It is expected that this work will continue until wet weather forces a shut-down.

The reconstruction of the highway between Mad River and Mill Creek, 0.9 mile, by Ellison & Smith, Contractors, is approximately 85 per cent complete and it is expected that traffic will be carried over the new work before winter rains set in.

Contractors Kennedy & Bayles have made splendid progress on their contract for grading and surfacing the Redwood Highway between Arcata and Mad River and it is expected that their work will be complete around the last of September.

The Butte Construction Company, who have the contract for the construction of the new bridge over Mad River, have made good progress and the steel work is now being placed. It is expected that the new bridge will be ready to carry the next season's tourist traffic.

The construction of the overhead crossing of the highway over the Northwestern Pacific Railroad and the Arcata and Mad River Railroad, approximately one mile north of Arcata, is well under way by the Mercer-Fraser Company of Eureka.

The completion of the last four named contracts is expected in time to permit traffic over the entire distance between Arcata and Mill Creek, by early next spring.

The grading of the new highway between Loleta and a point approximately 7½ miles south of Eureka, a distance of 7.3 miles, is under contract to E. C. Coats of Sacramento. The grading work is approximately two-thirds complete but it is doubtful whether the entire job will be completed before winter rains set in.

Bids are to be received on October 9, for the grading of a 28-foot standard roadway and surfacing with

8-foot by 20-foot of crushed rock surfacing, that portion of the highway between Fish Creek Grove and Stephens Grove, a distance of 3.2 miles. The improvement of this section will eliminate another very crooked piece of the Redwood Highway.

INYO COUNTY

From the southerly boundary to Little Lake, a distance of 9.8 miles, Fred W. Nighbert has a contract for grading and oil-treated surfacing. Work is well under way on this contract. Resident Engineer B. M. Gallagher is in charge of this work.

Grading and placing of oil-treated surfacing between Little Lake and Coso Junction, a distance of 3.7 miles is now being advertised.

Plans have been prepared and submitted for grading and placing of oil-treated surfacing from Coso Junction to Olancha, approximately 21.8 miles. This work will be advertised soon.

From Olancha to the northerly boundary an excellent oil-treated surface is in place. The portion from Cottonwood Creek to Diaz Lake, a distance of 10.3 miles, was completed September 7th by G. W. Ellis, who had the contract. H. M. Hansen was resident engineer in charge of this work.

Oil-treating of shoulders between Bishop and Mono County line is now in progress by maintenance forces under the direction of Dwight Wonacott, foreman.

KERN COUNTY

From Mojave to the northerly boundary of Kern County several constructive operations for improvements are under way and completed.

On that portion of the highway, between Mojave and Cinco, a distance of approximately 17.2 miles, grading and oil-treated surfacing has been completed on two contracts. Between Mojave to 7 miles south of Cinco, a distance of 9.9 miles, work was completed by the contractors, Bartlett and Mathews. The resident engineer was S. C. Risley. Between 7 miles south of Cinco and Cinco, a distance of 7.3 miles, the work was completed by the Southwest Paving Company. The resident engineer was W. Mathews.

Plans are nearly complete for grading and placing of an oil-treated surface from Cinco to 7 miles north of Ricardo, a distance of approximately 16 miles, through the scenic Red Rock Canyon.

From this point on to the northerly boundary of the county there are two other contracts under way, approximately 24.1 miles. From 7 miles north of Ricardo to Freeman a distance of 10.2 miles, G. W. Ellis is contractor, and from Freeman to the northerly boundary, a distance of 13.9 miles, Bartlett & Mathews and Black & Hagey are the contractors. V. E. Pearson is the resident engineer in charge of this work.

LAKE COUNTY

The grading of the Ukiah-Tahoe road between Clear Lake Oaks and Sweet Hollow Summit has been completed by convict labor forces. From the Summit to Abbott Mine the 20-foot graded roadbed is being widened to 24 feet.

Hemstreet and Bell have recently contracted to place a 20-foot crushed rock and oil mix surface from High Valley Creek to Abbott Mine, about 15.6 miles. This work is programmed for completion January 27, 1930 and to date is about 65 per cent complete.

Construction of a graded road to be surfaced with oil-treated crushed gravel or stone is under way between Lucerne and Clear Lake Oaks. The work is being performed under contract by von der Hellen, Pierson and Logan. This project is scheduled for completion November 12, 1929 and it is now approximately 80 per cent complete.

LASSEN COUNTY

Construction is now in progress on a 4-mile unit between Goodrich and Coppervale, a short distance east of Westwood, which will complete a short gap that has been in existence for several years. Work is being rushed as much as possible in order to beat the snow season. Doveri & Company & J. A. Maddox of Klamath Falls, Oregon, are contractors on this project, Contract 02TC4.

Hein Brothers and Chittenden are getting away to a good start on the resurfacing project between Susanville and Milford in Lassen County, a distance of 19.4 miles, Contract 22LC2. It is probable that work on this project will go into the winter, but it is of such a nature that cold weather will not seriously affect the progress.

Contract 02CN1, covering the grading and construction of culverts on 5 miles of highway across Long Valley in Lassen County south of Doyle, is under construction. The contractor on this project is Meyer Rosenberg of San Francisco. This is Mr. Rosenberg's first highway contract, but he is rushing the work to completion and will be well out of the way before winter. The construction of this project will eliminate 7 grade crossings over the Western Pacific Railroad between Doyle and Constantia.

LOS ANGELES COUNTY

A line change immediately north of the Newhall Tunnel has been surveyed, and the work is now being advertised for bids. This change eliminates some very bad curves, and it is expected construction will be under way this fall.

Work on paving crescent-shaped areas on the Ridge Route with bituminous macadam is being done by Gibbons & Reed, contractors. These areas were left unpaved when alignment on this route was straightened by the state day labor forces. Emulsified asphalt is being used in this work.

Rapid progress is being made in the work of grading the Newhall Alternate Line between Tunnel Station and the Santa Clara River. LeTourneau and Lindberg are the contractors. It consists of grading a 46-foot roadbed, 8.6 miles long, and eliminates from this route the Newhall Tunnel and several dangerous curves in the vicinity of Newhall and Saugus. It is expected this work will be completed about December 1st.

A contract on the Foothill Boulevard, between Glendora and Claremont, is rapidly nearing completion. This consists of 5.5 miles of asphaltic concrete pavement, 30 feet by 6 inches. The Griffith Company is the contractor.

The first contract on the La Canada-Mt. Wilson Highway for grading 2.6 miles of 40-foot roadbed was

awarded to H. W. Rohl Company on August 14th. Grading work is in progress.

MENDOCINO COUNTY

State forces are widening and straightening the roadway between the sidehill viaduct about 4 miles north of Lane's Redwood Flat and Red Mountain Creek. When this portion of narrow road along the steep bluffs of the South Fork of Eel River is completed, the last very narrow section of the Redwood Highway will have been eliminated. The road is being graded to a 24-foot standard roadway width and surfaced with 8 inches of crushed rock surfacing.

MONO COUNTY

At Hilton Creek, 1.57 miles of grading by D. C. Pollis is nearing completion. Between Magee Creek and Convict Creek, approximately 3 miles of grading and crushed rock surfacing is well under way by Montfort & Armstrong, contractors. Walter Mathews is resident engineer in charge of this work.

Between Matly Ranch and Leevining Creek there is 2.18 miles of grading and oiled macadam surface. C. Miles, the contractor on this work is making rapid progress. Kenneth Peirce, is assistant resident engineer in charge of this work for the state.

A portion of Route 23, in the Walker River Canyon, near Coleville, has been completed by day labor forces, under the supervision of Paul Peak, Foreman.

A one and one-half yard Northwest shovel is busy widening and straightening the Sonora Pass Road, between Sonora Junction and the Pass. The work is being done with Minor Improvement and Betterment Funds, under the supervision of Paul Peak, Foreman, with maintenance forces.

Widening and straightening of the narrow places on the Tioga Road; Road IX-Mno-40-A, is now moving along satisfactorily with state forces, under the direction of Ray Flynn, Foreman.

Standard guard rails are being placed on Dogtown and Conway grades, under the supervision of Joe Penrose.

Approximately one thousand feet of rail has just been completed on Sherwin Hill and Rock Creek grades by Mr. Penrose.

MONTEREY COUNTY

Work is in progress on the reconstruction of the Coast Highway between Chualar and Salinas, a distance of 10.3 miles. This work involves grading a 36 foot road bed and placing a 20 foot asphaltic concrete, second-story pavement. The Peninsula Paving Company of San Francisco is the contractor. Within the limits of this project, at Spence there will be a change of line and an underpass of the Southern Pacific tracks. Bids have been received on this work with Triberti-Massarro submitting the low bid. The underpass and approach will be under the supervision of the Bridge Department.

A new bridge across the Salinas River, at San Ardo is under construction by Contractor, Ben C. Gerwich. This work is under supervision of the Bridge Department. Bids are being received on grading and paving with Portland cement concrete, a

change of line, 1.5 miles in length including the approaches to this bridge.

Plans are complete for a change of line at the crossing of the Coast Highway over the Salinas River at Bradley and the Bridge Department is preparing plans for a new bridge.

On the San Simeon-Carmel Highway across the Little Sur River, a new bridge consisting of one 50-foot deck truss span and 14 19-foot timber spans is under construction by Lord and Bishop, Contractors.

Construction of oiled rock shoulders has been under way by state forces over a considerable portion of the Coast Highway where the width of paving is only 15 feet and has increased the safety of travel over these portions materially.

NEVADA COUNTY

Grading of a state highway by the Callahan Construction Company has been resumed between Indian Springs and Soda Springs near the summit of the Colfax-Truckee road. Travel is being maintained through the construction with little inconvenience. On account of the many difficulties encountered on this work, it is doubtful whether this work will be completed this year.

C. R. Adams was awarded the contract for grading and surfacing 11.7 miles between Nevada City and Washington Road, and this work is well under way. This section, consistent with the rest of the Ukiah-Tahoe Highway, will consist of a 24-foot roadbed. An oil-mixed crushed rock surface, 20 feet wide, is to be placed by the terms of the contract. This project is programmed for completion in April, 1930.

NEVADA AND PLACER COUNTIES

Improvement is under way between Roseville and one-half mile north of Andora Subway. The work is being done by J. E. Johnston and consists of placing bituminous macadam surfacing on the existing pavement and constructing rock borders.

Between Airport and Indian Springs on Route 37, 9.3 miles of grading is in progress. This project covers the construction of a 28-foot roadbed and was awarded to T. E. Connolly. Construction will be completed November, 1930.

A contract has been awarded to Meyer Rosenberg for placing 6.9 miles of bituminous surface treatment, 20 feet wide, between Soda Springs and Donner Lake. This work has been suspended as the temperature does not permit oiling.

ORANGE COUNTY

The contract for a line change 0.7 of a mile in length between Serra and San Juan Capistrano was awarded to Match Bros. on August 12th. This work consists of a 40 foot graded roadbed with Portland cement concrete pavement, 20 feet by 7 inches. Grading and culvert work is now under way.

A contract for a line change to connect up the overhead crossing of the A. T. & S. F. Railway at Irvine is in progress. This consists of grading 0.7 of a mile and paving with Portland cement concrete 30 feet wide. This contract is approximately two-thirds complete. Steele Finley is the contractor.

A contract for paving one-half width between Santa Ana and Anaheim was awarded on June 11th to Griffith Company. This section is 4.9 miles long. The paving work is being done in cooperation with Orange County, the state paying for a strip of pavement 28 feet by 7 inches and the county paying for a like amount. Normal progress is being made and it is expected that this contract will be finished next April.

PLUMAS COUNTY

On the Harlowe job, a 6½-mile project south of Chester in Plumas County, work is nearing completion. This job has been carried through two seasons, but it is expected that it will be ready for acceptance within the next three or four weeks and will be ready for traffic in time for the opening of the U. S. Bureau of Public Roads job between Morgan Springs and the county line in Tehama County. These two units will eliminate the high climb over the Feather River Summit on the existing county road and will pass through country in the Lassen National Forest, equally as interesting as that which the old road passes through.

Camp No. 16, located near Paxton, is manned by 122 convicts and 30 free men. The major grading equipment consists of two gasoline power shovels. Of the 7½ miles on this project, approximately 5 miles have been completed to date, and it is anticipated that the work will be completed early in 1930. In addition to the grading work, the camp forces are constructing a two-span wooden truss bridge across Indian Creek. The bridge will be completed in two or three weeks. This unit is a part of the Feather River Highway between Quincy and Oroville, which will undoubtedly prove a very heavily traveled road when completed.

SACRAMENTO COUNTY

Fredrickson-Watson Construction Company & Fredrickson Brothers were awarded the construction of 8.7 miles of Portland cement concrete pavement on the Sacramento-Roseville road between Ben Ali and Sylvan School. This project is progressing satisfactorily and will be completed, in all probability, within the allotted time. The time for completion is set as January, 1930. This contract is being constructed according to the latest standards and methods of Portland cement concrete pavement.

Larsen Brothers contract for grading and surfacing between Arno and McConnell on the highway between Sacramento and Stockton is well under way. This job will eliminate the dilapidated narrow trestle and road here.

SAN BENITO COUNTY

On the Coast Highway at intervals between a point 7 miles north of Salinas and San Juan Bautista, a 1½-inch bituminous macadam surface 16 feet wide is being placed by W. A. Dontanville, Contractor. A total of 2.4 miles of surface is being placed, which work started on September 13th and should be completed about the middle of October. This surfacing is being placed on those portions of the road where the present paving is badly cracked, including portions of the San Juan Grade.

SAN DIEGO COUNTY

A contract was awarded September 10, 1929, to the R. E. Hazard Contracting Co. of San Diego for constructing oil rock borders on portions of the Coast Route between the city limits of San Diego and Oceanside. Work will be started at an early date.

A contract for grading the Rose Canyon road between Balboa avenue and Torrey Pines Road was awarded on August 13th to the R. E. Hazard Contracting Company. This section is 5.4 miles long and is to be a 46-foot graded roadbed. Work is just starting on this contract.

The contract for grading a roadbed 36 feet wide and placing of Portland cement concrete pavement 20 feet by 7 inches is in progress between Pine Valley and Kitchen Creek on the San Diego-El Centro Highway. It is expected that this section will be completed by the end of the year.

A contract for 4.5 miles of 38-foot graded roadbed between La Posta Creek and Miller Creek on the San Diego-El Centro Highway was awarded on May 27th to the Nevada Contracting Company. Grading is in progress for a distance of about two miles.

A contract for grading 3.9 miles of 36-foot roadbed from Kitchen Creek to La Posta and paving with 20 feet by 7 inches Portland cement concrete was awarded on June 25th to Basich Bros. About one mile of rough grading is completed, and grading is now in progress on about one-half mile. This section is on the San Diego-El Centro Highway.

SAN JOAQUIN COUNTY

We have two contracts under way in San Joaquin County. The one between Mossdale and Banta, C. W. Wood, Contractor, for grading and cement concrete paving 3.1 miles, is progressing satisfactorily. This is on the highway between Stockton and Tracy, the main road to Oakland. The other is for grading and surfacing two line changes on the Hogan Road between Stockton and Manteca—the main highway between Stockton and Los Angeles. Lilly, Willard & Biasotti are the contractors. The work is well under way.

Eight-foot rock shoulders are being placed from Banta to the Alameda County line to make the highway safer for traffic, especially during the winter months.

SAN LUIS OBISPO COUNTY

Work has been completed on grading and paving with 20-foot and 30-foot width of Portland cement concrete pavement from Pismo to Arroyo Grande. Through the town of Pismo, street improvements have been extended the full width of the street by a local improvement district and conforms with other work being done in Pismo. Cornwall Construction Company was the contractor on both the 30-foot width of paving by the state through the town of Pismo and also on the Improvement District work.

On the Coast Highway between Cuesta and 1½ miles south of Santa Margarita, 1.9 miles of grading and paving is being constructed by Mr. M. J. Bevanda, Contractor. This work will improve the alignment and provide a 20-foot concrete pavement at the north end of Cuesta Grade.

Work is being started by Mr. Bevanda on a change of line and the construction of a timber bridge over Yerba Buena Creek just north of Santa Margarita. This work will correct a dangerous curve that has been the scene of several accidents.

Contract has been awarded to Steel Finley of Santa Ana for the reconstruction of the Coast Highway with a 36-foot roadbed and 20-foot asphaltic concrete pavement for a distance of 9.6 miles, between Atascadero and Paso Robles. This work will correct the alignment and grade at many places and in the vicinity of Graves Creek and Paso Robles Creek major line changes will be made. The new alignment will use the existing structure over Paso Robles Creek but a new structure will be required across Graves Creek. The contract for this bridge has been awarded to William Lane of Paso Robles and is under the supervision of the Bridge Department.

Through the town of Atascadero, a local improvement district will complete the street improvement for the full width of the right of way.

On the Cholame Lateral between a point 1.7 miles west of Shanden to the San Luis Obispo-Kern County line, regrading and placing a 20-foot bituminous macadam surface has been completed by A. Teichert and Son. Similar construction work is in progress by the same contractor from the west end of the first project to the Estrella River, a distance of about 6 miles. Material for this work is produced from a local quarry developed by the contractor.

Just north of Cambria on the San Simeon road, Route 56, 0.9 mile of grading to a 30-foot roadbed width and gravel surfacing 20 feet wide is being constructed by Tiffany, McReynolds, Tiffany of San Jose. This replaces a portion of county-built road between Cambria Pines Subdivision.

Surveys have been completed and plans are being prepared for the reconstruction of the Coast Highway from the Santa Maria River to Los Berros Creek, a distance of 7.4 miles.

SANTA BARBARA COUNTY

Work is nearing completion by McCray Co. of Los Angeles on a change of line over Rincon Hill between Benham and Carpinteria on the Coast Highway. This project involves grading a 46-foot roadbed and constructing a Portland cement concrete pavement 30 feet in width. A new steel and concrete bridge is nearly complete across the Southern Pacific tracks within the limits of this line change on which Paul M. White is contractor.

Work has been completed by Sam Hunter on the grading of a 36-foot roadbed and the placing of a 20-foot second-story asphaltic concrete pavement on 3.5 miles of the Coast Highway near Ellwood.

M. J. Bevanda, Contractor, has completed the placing of bituminous macadam surface 14½-inch by 20-foot on 2.4 miles of the Coast Highway between Los Alamos and 6½ miles north, which will eliminate some very rough old concrete pavement.

SHASTA AND TRINITY COUNTIES

A. Milne, Contractor, is now making rapid strides on Contract 02TC3 in Shasta and Trinity counties, which provides for the surfacing of portions of new highway and the resurfacing of portions of old highway amounting, in all, to 17 miles of work. Work progressed very slowly at first due to the high per-

centage of waste encountered in the gravel bars in Weaver Creek where the plant was first set up. However, a new source of rock was obtained and an additional plant has been set up on the Shasta County end, and work is now progressing rapidly.

Camp No. 12, which is located at Shingle Shanty in Trinity County, manned by 133 convicts and 28 free men, is constructing a new graded roadway on 19.24 miles in Trinity and Shasta counties. The grading is being handled by two gasoline power shovels and by the use of swede traps and tunnels, and work is progressing very satisfactorily. Due to the extreme heavy character of the work on these projects, this camp will be engaged on this work about one year more. The completion will provide a continuous improved highway between Redding and Weaverville and will cut down the present running time between the two points approximately one hour.

Camp No. 20, located about 8 miles east of Ingot on the Redding-Alturas lateral, has been operating about one month and is just getting a good start on the 13-mile unit. The equipment on this work consists of one gasoline power shovel, and the forces consist of 52 convicts and 12 free men. The project is located in the Cow Creek and Cedar Creek canyons in Shasta County, and the work will result in a very decided improvement, as the existing road is rather narrow and crooked.

SISKIYOU COUNTY

A contract is now in progress in Siskiyou County between Shasta River and Gazelle. This contract consists of the reconstruction of the old roadbed and the placing of a concrete pavement 20 feet in width on 7.7 miles of highway. Work is progressing very favorably at present, and it is expected that the new pavement will be in use before the winter rains set in. The contractor is producing his own aggregates from sources on the job and while he experienced some difficulty at the start in obtaining fine aggregate, adjustments in his plant and blends of the local sand have produced a material which will give very satisfactory results. The T. M. Morgan Paving Company of Los Angeles is doing the work.

A contract has just been awarded to the Mathews Construction Company for the paving of 0.65 miles of reconstructed highway at Spring Hill just north of Mt. Shasta City. The contractor is now assembling his equipment preparatory to getting on to the ground. The grading on this reconstruction was recently completed by Young Brothers and involved the moving of the Southern Pacific Company's tracks and the grading of 0.65 miles of highway, eliminating a very dangerous 200-foot radius curve at the foot of a steep grade. It is anticipated that the paving work will be completed well in advance of winter weather.

SOLANO COUNTY

A serious traffic hazard is now removed by the near completion of the grading and surfacing with bituminous macadam of the highway through Jamison Canyon between Napa County and Cordelia. This job also involved the moving of several miles of pipe line which supplies the city of Vallejo.

State forces under Superintendent G. E. Marshall are placing an oil macadam wearing surface over the new line change at Cordelia.

STANISLAUS COUNTY

The asphaltic surface between Turlock and Keyes is being honed to reduce roughness in the pavement.

TUOLUMNE COUNTY

A grading job 1.6 miles long on the Mother Lode Highway, now completed, gives a much improved entrance to Sonora, "Queen of the Southern Mines." This road connects the old road with the Columbia-Sonora Road already paved with asphalt concrete several years ago. Noble Brothers are the contractors. A contract for surfacing this job will be advertised in the near future.

Another job in the same vicinity is nearing completion. This is the Lilly, Willard & Biasotti contract for the grading and surfacing with oil rock pre-mix of 1.6 miles on the Sonora-Mono Road just east of Sonora.

Work will soon be completed on the new line change near the top of the Sonora Pass, which will eliminate the third and fourth crossings of Deadman's Creek. Last year a change was made which eliminated the first and second crossings of this treacherous creek. Superintendent Ed Harris is in charge of the work.

YOLO COUNTY

Plans and estimates have been made and the state is preparing to proceed with the improvement of Mullen Crossing of the Southern Pacific Railroad, south of Woodland. The work to be done consists of grading and paving with Portland cement concrete pavement on line change to eliminate the present jagged and rough crossing. Neon tube railroad crossing signs will be installed over the road on each side of the crossing.

The state highway between Bretona and Dunningan will be improved soon under contract by J. E. Johnston. The work will consist of placing bituminous surfacing on existing pavement and constructing rock borders.

YUBA COUNTY

The state highway between Dry Creek and Morrison's Crossing is to be improved by placing bituminous macadam surfacing on the existing pavement and constructing rock borders on each side of the pavement. The work will be done under contract by J. E. Johnston.

The dull boy in the class unexpectedly distinguished himself in a recent examination when, in replying to the question, "How and where was slavery introduced into America?" he wrote:

"No women had come over to the early Virginia colony. The planters wanted wives to help with the work. In 1619 the London Co. sent over a shipload of girls. The planters gladly married them and slavery was introduced into America."—*The Pathfinder*.

Record of Bids and Awards

HIGHWAY BID OPENINGS FROM JULY 31 TO SEPTEMBER 25

AMADOR COUNTY—Between Drytown and Amador City, 2.7 miles to be surfaced with untreated crushed gravel or stone. Dist. X, Rt. 65, Sec. B. A. J. Grier, Oakland, \$27,410; Tieslau Bros, Berkeley, \$30,835. Contract awarded to Hemstree & Bell, Marysville, \$27,075.

DEL NORTE COUNTY—Between Smith River and Oregon line, 35.5 miles of producing and stock-piling screenings. Dist. 1, Rt. 1, Secs. C D and E. Smith Bros, Eureka, \$34,680. Contract awarded to Holdener Construction Company, Inc., Sacramento, \$33,048.

EL DORADO COUNTY—Between Bay View Rest and 1 mile north of Eagle Falls, 1.8 miles to be graded. Dist. III, Rt. 38, Sec. B. J. M. De Luca, Oakland, \$186,738; Robert Heaney, Hayward, \$181,123.70. Contract awarded to Nate Lovelace, Sacramento, \$179,936.

LOS ANGELES COUNTY—0.8 of a mile north of Sandberg's to 2.5 miles north of Sandberg's, to be surfaced with bituminous macadam. Dist. VII, Rt. 4, Sec. 4. Contract awarded to Gibbons & Reed, Burbank, \$13,352.

MADERA COUNTY—Between Califa and northerly boundary, 5.6 miles to be graded and paved with asphaltic concrete. Dist. VI, Rt. 4, Sec. C. Force, Currihan & McLeod, Oakland, \$153,884; Hanrahan Co., San Francisco, \$144,747.50; Valley Paving & Const. Co., Visalia, \$153,940. Contract awarded to A. Teichert & Son, Sacramento, \$135,636.10.

MARIN COUNTY—Between Galinas Creek and San Rafael, 1.8 miles to be graded and paved with Portland cement concrete and bituminous macadam. Dist. IV, Rt. 1, Sec. A. W. H. Hauser, Oakland, \$162,774; Hanrahan Company, San Francisco, \$175,558; C. T. Malcom, Walnut Creek, \$174,359; D. McDonald, Sacramento, \$178,538; Isbell Construction Co., Fresno, \$198,593; M. J. Bevanda, Stockton, \$227,185; Fredrickson & Watson Const. Co., Oakland, \$173,875; J. P. Holland, Inc., San Francisco, \$156,243; E. C. Coats, Sacramento, \$175,575. Contract awarded to Granfield, Farrar & Carlin, San Francisco, \$133,231.75.

MONTEREY COUNTY—Near Spence, and under-grade crossing under the S. P. R. Co. tracks. Dist. V, Rt. 2, Sec. B. C. C. Gildersleeve, Felton, \$26,585; McDonald & Maggiora, Sausalito, \$30,332; Ward Engineering Co., San Francisco, \$37,238; MacDonald & Kahn, Inc., San Francisco, \$32,449; Fredrickson Bros. Const. Co., Oakland, \$31,087; Otto Parlier, Tulare, \$28,087; Pan. Pac. Piling & Const. Co., Los Angeles, \$34,639; Healy-Tibbitts Const. Co., San Francisco, \$25,440; C. Dudley De Velbiss, Oakland, \$31,573; Arthur J. Greer, Oakland, \$31,652. Contract awarded to Triberto-Massarro Co., Oakland, \$24,555.50.

ORANGE COUNTY—Westerly of San Clemente, about 0.2 of a mile to be graded and paved with Portland cement concrete. Dist. VII, Rt. 2, Sec. A. Contract awarded to Match Bros., Elsinore, \$8,872.75.

SAN BERNARDINO COUNTY—Between 2 miles west of Argos and 1½ miles west of Siberia, 19.5 miles to be graded and surfaced with oil-treated crushed gravel. Dist. VIII, Rt. 58, Secs. H and J. Allied

Contractors, Inc., Omaha, Neb., \$408,799; George Herz & Co., San Bernardino, \$380,396; V. R. Dennis Construction Co., San Diego, \$408,629; Macco Construction Co., Clearwater, \$411,433; Hodgman & Macvicar, Pasadena, \$436,426. Contract awarded to New Mexico Construction Co., Denver, Colo., \$368,022.10.

SAN DIEGO COUNTY—Between San Diego and Oceanside, 3 miles to be widened with bituminous macadam borders. Dist. VII, Rt. 2, Secs. A and B. Butterfield Const. Co., San Diego, \$35,630; Match Bros., Elsinore, \$35,850; Watson & Sutton, San Diego, \$36,025. Contract awarded to R. E. Hazard Contracting Co., San Diego, \$33,686.

SAN LUIS OBISPO COUNTY—Between Atascadero and Paso Robles, 9.6 miles to be graded and paved with asphaltic concrete. Dist. V, Rt. 2, Sec. B. Peninsula Paving Co., San Francisco, \$277,499; Valley Paving & Const. Co., Visalia, \$306,351; George R. Curtis Paving Co., Los Angeles, \$313,283; Sander Pearson, Santa Monica, \$318,846; Cornwall Const. Co., Santa Barbara, \$304,276; Force, Currihan & McLeod, Oakland, \$313,492; Western Roads Co., Oakland, \$288,590; Gibbons & Reed Co., Burbank, \$329,206; A. Teichert & Son, Inc., Sacramento, \$303,839; M. J. Bevanda, Stockton, \$287,053; Hanrahan Company, San Francisco, \$327,624. Contract awarded to Steele Finley, Santa Ana, \$268,258.50.

SISKIYOU COUNTY—Steel deck truss bridge across Shasta River, about 6 miles north of Yreka. Dist. II, Rt. 3, Sec. C. Gutleben Bros., Oakland, \$222,619; Butte Construction Co., San Francisco, \$238,045; M. B. McGowan, San Francisco, \$239,863; Northwest Contracting Co., Portland, Ore., \$201,345; Schuler & McDonald, Inc., Oakland, \$246,659; Lynch-Cannon Engr. Co., Los Angeles, \$208,586; Bayly Hopkins, San Francisco, \$217,523; Mercer-Fraser Co., Eureka, \$224,644. Contract awarded to H. E. Doering, Portland, \$190,368.50.

SISKIYOU COUNTY—Near Mt. Shasta about 0.6 of a mile to be paved with Portland cement concrete. Dist. II, Rt. 3, Sec. A. J. E. Johnston, Stockton, \$21,158. Contract awarded to Mathews Const. Co., Sacramento, \$22,648.

SONOMA AND MARIN COUNTIES—Between Petaluma and Ignacio, 11.9 miles to be graded and paved with Portland cement concrete. Dist. IV, Rt. 1, Secs. C and A. J. P. Holland, Inc., San Francisco, \$558,649; Guy F. Atkinson Company, San Francisco, \$633,209; Ward Engineering Co., San Francisco, \$729,036; Fredrickson & Watson, Oakland, \$503,802; M. J. Bevanda, Stockton, \$578,746; J. F. Knapp, Oakland, \$614,686; E. Paul Ford, San Diego, \$540,879; Mercer-Fraser Co., Eureka, \$659,786. Contract awarded to Hanrahan Co., San Francisco, \$536,795.75.

TEHAMA COUNTY—Between Paynes Creek and Morgan Springs, 28.7 miles to be surfaced with untreated crushed gravel or stone. Dist. II, Rt. 29, Secs. B and C. Milne & Dussault, Portland, Ore., \$97,471; Hemstreet & Bell, Marysville, \$100,251. Contract awarded to A. F. Giddings, Sacramento, \$95,757.50.

WATER PERMITS AND APPLICATIONS

Applications for Permit to Appropriate Water Filed with the State Department of Public Works, Division of Water Resources, During September, 1929.

ALAMEDA COUNTY—Application 6136. Charles Wilton Fay, 4131 Lincoln Ave., Oakland, for 3 c.f.s.

from Mill Creek tributary to Indian Creek to be diverted in Sec. 25, T. 18 N., R. 6 E., M. D. M., for domestic and mining purposes.

BUTTE COUNTY—Application 6448. C. B. Malone, Oroville, for 6000 a.f. per annum from Bosh Creek tributary to Middle Fork Feather River to be diverted in Sec. 8, T. 21 N., R. 6 E., M. D. M., for mining purposes.

DEL NORTE COUNTY—Application 6441. Department of Public Works, Division of Highways, Sacramento, for 0.017 c.f.s. from unnamed spring tributary to Smith River to be diverted in Sec. 23, T. 17 N., R. 2 E., H. M., for domestic purposes. Estimated cost \$850.

DEL NORTE COUNTY—Application 6446. C. J. Dumbolton, Holland, Josephine County, Oregon, for 12 c.f.s. from Althouse Creek (Right Fork) tributary to Illinois River to be diverted in Sec. 32, T. 19 N., R. 6 E., H. M., for mining (hydraulic) purposes. Estimated cost \$1,000.

DEL NORTE COUNTY—Application 6447. F. M. McAuliffe, Nevada Bank Building, San Francisco, for 500 c.f.s. and 300,000 a.f. per annum from South Fork of Smith River tributary to Smith River to be diverted in Sec. 10, T. 16 N., R. 1 E., H. M., for power purposes.

EL DORADO COUNTY—Application 6439. Kelsey Mining Company, 224 Underwood Building, 931 Market St., San Francisco, for 25 c.f.s. from Rock Creek tributary to South Fork of American River to be diverted in Sec. 20, T. 11 N., R. 11 E., M. D. M., for power purposes. Estimated cost \$10,000.

EL DORADO COUNTY—Application 6440. Charles H. Parrott, 135 Carmel Ave., Roseville, for 200 gals. per day from unnamed stream tributary to South Fork American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$200.

INYO COUNTY—Application 6438. C. M. Davenport and Edward Schober, Los Angeles and Bishop, respectively, for 0.5 c.f.s. from (1) unnamed spring and (2) Grape Vine Spring tributary to no stream to be diverted in (1) Sec. 10, T. 21 S., R. 39 E., M. D. M., and (2) Sec. 15, T. 21 S., R. 39 E., M. D. M., for irrigation and domestic purposes on 40 acres in Sec. 4, T. 22 S., R. 39 E., M. D. M. Estimated cost \$5,000 to \$5,000.

KERN COUNTY—Application 6437. F. G. Oddous, 344 S. Alameda St., Los Angeles, for 0.0067 c.f.s. from unnamed spring tributary to no stream to be diverted in Sec. 23, T. 9 N., R. 21 W., S. B. M., for mining purposes.

LOS ANGELES COUNTY—Application 6425. Joseph Argay, Mt. Wilson, for 50 a.f. per annum from Coldwater Canyon Creek tributary to Big Tujunga to be diverted in Sec. 34, T. 3 N., R. 12 W., S. B. M., for mining and domestic purposes. Estimated cost \$2,500.

LOS ANGELES COUNTY—Application 6435. J. Frank Gore, 1832 Santa Monica Blvd., Beverly Hills, for 0.10 c.f.s. from unnamed spring tributary to City Creek to be diverted in Sec. 26, T. 1 N., R. 3 W., S. B. M., for irrigation purposes. Estimated cost \$750.

LOS ANGELES COUNTY—Application 6442. Paul Louis Holtz, Llano, for 0.39 c.f.s. from underground water tributary to no stream to be diverted in Sec. 21, T. 4 N., R. 8 W., S. B. M., for irrigation and domestic purposes. Estimated cost \$4,000.

LOS ANGELES COUNTY—Application 6438. William H. Helms, care John C. Packard, attorney, Chester Williams Building, 215 W. 5th St., Los Angeles, for 12 c.f.s. from Big Rock Creek to be diverted in Secs. 6 and 8, T. 4 N., R. 9 W., S. B. M., for domestic and irrigation purposes.

MENDOCINO COUNTY—Application 6426. Neil G. Mackinnon, Cummings, for 2 c.f.s. from Big Dan Creek tributary to South Fork Eel River to be diverted in Sec. 12, T. 23 N., R. 17 W., M. D. M., for irrigation and domestic purposes on 16 acres. Estimated cost \$1,200.

PLACER AND NEVADA COUNTIES—Application 6443. Bear River Water and Power Co., care J. L. Rollins, Colfax, for 100,000 a.f. per annum from Bear River and its tributaries tributary to Feather River to be diverted in Sec. 22, T. 15 N., R. 9 E., M. D. M., and Sec. 27, T. 15 N., R. 9 E., M. D. M., for power purposes. Water is available at lower levels for additional power for agricultural purposes and for domestic use. Estimated cost \$2,000,000 to \$2,500,000.

SACRAMENTO COUNTY—Application 6431. V. A. Palmer, 2800 Second Ave., Sacramento, for 200 gals. per day from unnamed stream tributary to South Fork

of American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$200.

SACRAMENTO COUNTY—Application 6434. Goida G. Whipple, Rt. 6, 4540, Sacramento, for 0.31 c.f.s. from Dry Creek tributary to Sacramento River, to be diverted in Sec. 32, T. 10 N., R. 5 E., M. D. M., for irrigation purposes.

SAN DIEGO COUNTY—Application 6445. Harold S. Kibbey, Lakeside, for 0.05 c.f.s. from unnamed spring tributary to San Vicente Creek watershed to be diverted in Sec. 5, T. 15 S., R. 1 E., S. B. M., for domestic irrigation and stock watering purposes. Estimated cost \$1,000.

SAN JOAQUIN COUNTY—Application 6430. C. B. Orvis, Stockton, for 12.0 c.f.s. from State Canal tributary to South Fork of Mokelumne River to be diverted in Sec. 15, T. 4 N., R. 5 E., M. D. M., for agricultural purposes. Estimated cost \$6,500.

SAN JOAQUIN COUNTY—Application 6432. R. G. Houston and Raymond W. Miller, Linden, for 100,000 a.f. per annum from Calaveras River tributary to San Joaquin River to be diverted in Sec. 31, T. 4 N., R. 11 E., M. D. M., for irrigation and domestic purposes.

SIERRA COUNTY—Application 6433. J. B. Harris, care R. E. Taylor, Downville, for 0.125 c.f.s. from 2 unnamed springs tributary to Goodyear Creek and North Fork Yuba River to be diverted in Sec. 32, T. 20 N., R. 10 E., M. D. M., for power purposes. Estimated cost \$500.

SISKIYOU COUNTY—Application 6427. Frank L. Cunningham, Happy Camp, for 10 c.f.s. from Oak Flat Creek tributary to Klamath River to be diverted in Sec. 32, T. 16 N., R. 7 E., H. M., for power purposes. Estimated cost \$1,000.

SOLANO COUNTY—Application 6444. A. C. and Minnie T. Sullivan, Winters, for 0.37 c.f.s. from Miller or Pleasant Valley Creek tributary to Putah Creek to be diverted in Secs. 1 and 2, T. 7 N., R. 2 W., M. D. M., for irrigation purposes.

TRINITY COUNTY—Application 6429. C. M. Salver, Trinity County, for 125 c.f.s. from Campbell Creek (sometimes known as Madden and Vergin Creek) tributary to South Fork of the Trinity River to be diverted in Sec. 20, T. 6 N., R. 5 E., H. B. M., for hydraulic mining purposes.

Permits to Appropriate Water Issued by the Department of Public Works, Division of Water Resources, During September, 1929.

EL DORADO COUNTY—Permit 3335, Application 6006. Issued to L. G. Johnson, Arbuckle, Sept. 28, 1929, for 200 gals. per day from Channel Spring in Sec. 15, T. 11 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$75.

EL DORADO COUNTY—Permit 3328, Application 6238. Issued to Pacific Gas & Electric Co., San Francisco, Sept. 15, 1929, for 0.025 c.f.s. from unnamed spring in Sec. 30, T. 11 N., R. 14 E., M. D. M., for domestic and industrial use. Estimated cost \$1,000.

HUMBOLDT COUNTY—Permit 3329, Application 6341. Issued to Thos. H. Salvage, Eureka, Sept. 23, 1929, for 0.01 c.f.s. from unnamed spring in Sec. 30, T. 2 S., R. 1 W., H. M., for irrigation and domestic purposes. Estimated cost \$300.

INYO COUNTY—Permit 3336, Application 3391. Issued to Alfred Giraud, Bishop, Sept. 25, 1929, for 0.003 c.f.s. from Eaton Springs in Sec. 12, T. 23 S., R. 41 E., M. D. M., for watering stock. Estimated cost \$750.

MADERA COUNTY—Permit 3336, Application 5769. Issued to J. H. Woodon and J. R. Fowler, Fresno, Sept. 28, 1929, for 2 c.f.s. direct diversion and 200 a.f. storage from Jackass Creek and Jackass Lake, in Secs. 4 and 10, T. 5 S., R. 24 E., M. D. M., for power. 40 h.p. to be developed. Estimated cost \$500.

MENDOCINO COUNTY—Permit 3327, Application 6018. Issued to W. A. Foster, Willits, Sept. 13, 1929, for 0.1 c.f.s. from Rattlesnake Creek in Sec. 20, T. 23 N., R. 16 W., M. D. M., for irrigation and domestic use. Estimated cost \$400.

MONO COUNTY—Permit 3337, Application 6054. Issued to Nyle Smith, Los Angeles, Sept. 30, 1929, for 200 gals. per day from unnamed spring in Sec. 16, T. 4 S., R. 27 E., M. D. M., for domestic use. Estimated cost \$35.

MONO COUNTY—Permit 3326, Application 6321. Issued to M. Zuckerman, Inc., Stockton, Sept. 12, 1929,

for 200 gals. per day from Rock Creek in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic purposes. Estimated cost \$400.

MONO COUNTY—Permit 3325, Application 6320. Issued to John S. Zuckerman, Berkeley, Sept. 12, 1929, for 200 gals. per day from Rock Creek in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic purposes. Estimated cost \$50.

PLUMAS COUNTY—Permit 3322, Application 6314. Issued to W. M. Cayton, Virginia, Sept. 11, 1929, for 0.044 c.f.s. from unnamed spring in Sec. 20, T. 25 N., R. 8 E., M. D. M., for domestic and irrigation use on 1½ acres

SAN BERNARDINO COUNTY—Permit 3332, Application 6300. Issued to Homer Aldrich Rue, Los Angeles, Sept. 27, 1929, for 0.31 c.f.s. from Horsethief Canyon in Sec. 31, T. 3 N., R. 4 W., S. B. M., for irrigation of 25 acres and domestic use. Estimated cost \$2,500.

SAN BERNARDINO COUNTY—Permit 3331, Application 6165. Issued to Homer Aldrich Rue, M.D., Los Angeles, Sept. 27, 1929, for 0.50 c.f.s. from Horsethief Canyon in Sec. 31, T. 3 N., R. 4 W., S. B. M., for domestic use and irrigation of 40 acres. Estimated cost \$2,000.

SAN BERNARDINO COUNTY—Permit 3333, Application 6221. Issued to Frank Marek, Summit, Sept. 27, 1929, for 0.06 c.f.s. from Horsethief Canyon and Mojave River in Sec. 36, T. 3 N., R. 5 W., S. B. M., for domestic use and irrigation of 3 acres.

SAN JOAQUIN COUNTY—Permit 3324, Application 6180. Issued to Mollie Raspo, Banta, Sept. 12, 1929, for 9.75 c.f.s. from Lone Tree Creek in Sec. 6, T. 4 S., R. 6 E., M. D. M., for irrigation of 780 acres. Estimated cost \$1,000.

SAN JOAQUIN COUNTY—Permit 3320, Application 6316. Issued to C. B. and W. S. Orvis, Stockton, Sept. 6, 1929, for 10.12 c.f.s. from Upland Canal in Sec. 33, T. 4 N., R. 5 E., M. D. M., for irrigation use. Estimated cost \$6,500.

SAN JOAQUIN COUNTY—Permit 3319, Application 6315. Issued to The Inland Finance Corporation, Stockton, Sept. 6, 1929, for 3.1 c.f.s. from Upland Canal in Sec. 33, T. 4 N., R. 5 E., M. D. M., for irrigation of 248.2 acres. Estimated cost \$6,500.

SISKIYOU COUNTY—Permit 3321, Application 6095. Issued to G. D. and J. G. Williamson et al., Chico, Sept. 10, 1929, for 15 c.f.s. from 3 unnamed creeks in Sec. 29, T. 14 N., R. 6 E., H. B. M., for mining purposes. Estimated cost \$2,500.

TUOLUMNE COUNTY—Permit 3323, Application 6352. Issued to Isabel Laughlin Raube, Modesto, Sept. 11, 1929, for 0.0025 c.f.s. from spring in Sec. 12, T. 1 N., R. 15 E., M. D. M., for domestic purposes. Estimated cost \$110.

VENTURA COUNTY—Permit 3334, Application 6261. Issued to Sam J. Akers, Fillmore, Sept. 27, 1929, for 0.26 c.f.s. from Sespe River in Sec. 12, T. 4 N., R. 20 W., S. B. M., for 2112 acres, irrigation and domestic. Estimated cost \$1,000.

AWARD OF CONTRACTS DIVISION OF ARCHITECTURE

SAN DIEGO STATE TEACHERS COLLEGE—Pettifer Hunt Company—For general work on the Academic Building. Contract price, \$137,350.

W. H. Robinson—For heating, ventilating and plumbing work on the Academic Building. Contract price, \$25,722.

Capitol Electric Company—For electrical work on the Academic Building. Contract price, \$13,720.

MENDOCINO STATE HOSPITAL (Talmage)—J. S. Hannah—For general work on wards "15" and "K." Contract price, \$99,900.

Collins Electrical Company—For electrical work on above buildings. Contract price, \$2,983.

Nottingham Heating and Ventilating Company—For plumbing and heating on the above buildings. Contract price, \$19,666.

SAN FRANCISCO STATE TEACHERS COLLEGE—F. C. Amoroso & Sons—For constructing sidewalk and retaining wall. Contract price, \$15,897.

CALIFORNIA POLYTECHNIC SCHOOL—R. S. K. MacMillan—For general work on Boys' Dormitory. Contract price, \$27,900.

Walter H. Smith—For mechanical work on above. Contract price, \$3,675.

STATE OF CALIFORNIA
Department of Public Works

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

C. C. YOUNG.....Governor

B. B. MEEK.....Director

CORNING DE SAULES.....Deputy Director

DIVISION OF HIGHWAYS

CALIFORNIA HIGHWAY COMMISSION

RALPH W. BULL, Chairman, Eureka
J. P. BAUMGARTNER, Commissioner, Santa Ana
M. B. HARRIS, Commissioner, Patterson Bldg., Fresno
JOSEPH M. SCHENCK, Commissioner, c/o United Artists Studio, Santa Monica Blvd., Los Angeles
FRED S. MOODY, Commissioner, 640 Kohl Bldg., San Francisco

C. H. PURCELL, State Highway Engineer, Sacramento
GEORGE C. MANSFIELD, Secretary
HARRY A. ENCELL, Attorney, San Francisco

HEADQUARTERS STAFF, SACRAMENTO

G. T. McCOY, Administrative Assistant
L. V. CAMPBELL, Office Engineer
T. E. STANTON, Materials and Research Engineer
FRED J. GRUMM, Engineer of Surveys and Plans
C. S. POPE, Construction Engineer
T. H. DENNIS, Maintenance Engineer
CHAS. E. ANDREW, Bridge Engineer
R. H. STALNAKER, Equipment Engineer
E. R. HIGGINS, Chief Accountant

DISTRICT ENGINEERS

F. W. HASELWOOD, District I, Eureka
H. S. COMLY, District II, Redding
CHARLES H. WHITMORE, District III, Sacramento
J. H. SKEGGS, District IV, San Francisco
L. H. GIBSON, District V, San Luis Obispo
E. E. WALLACE, District VI, Fresno
S. V. CORTELYOU, District VII, Los Angeles
E. Q. SULLIVAN, District VIII, San Bernardino
F. G. SOMNER, District IX, Bishop
R. E. PIERCE, District X, Sacramento
General Headquarters, Public Works Building,
Eleventh and P Streets, Sacramento, California

DIVISION OF WATER RESOURCES

EDWARD HYATT, State Engineer, Chief of Division
J. J. HALEY, Jr., Administrative Assistant
HAROLD CONKLING, Deputy in Charge Water Rights
A. D. EDMONSTON, Deputy in Charge Water Resources Investigation
R. L. JONES, Deputy in Charge Flood Control and Reclamation
GEORGE W. HAWLEY, Deputy in Charge of Dams

SPENCER BURROUGHS, Attorney
EVERETT N. BRYAN, Hydraulic Engineer, Water Rights
A. N. BURCH, Irrigation Investigations
H. M. STAFFORD, Sacramento-San Joaquin Water Supervisor
GORDON ZANDER, Adjudication, Water Distribution
KATHERINE A. FEENEY, Chief Clerk
MABEL PERRYMAN, Secretary
S. T. HARDING, Irrigation and Special Investigations

DIVISION OF ARCHITECTURE

GEO. B. McDOUGALL, Chief, Division of Architecture
P. T. POAGE, Assistant Architect
W. K. DANIELS, Deputy Chief of Division

HEADQUARTERS

H. W. DeHAVEN, Chief Architectural Draftsman
C. H. KROMER, Structural Engineer
CARLETON PIERSON, Specification Writer
C. O. PALM, Chief Clerk
C. E. BERG, Engineer, Estimates and Costs
J. W. DUTTON, General Superintendent Construction
W. H. ROCKINGHAM, Mechanical Engineer
C. A. HENDERLONG, Assistant Mechanical Engineer
W. M. CALLAHAN, Electrical Engineer

DIVISION OF MOTOR VEHICLES

FRANK G. SNOOK, Chief
EUGENE BISCAILUZ, Chief of California Highway Patrol

DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief

DIVISION OF PORTS

Port of Eureka—F. B. Barnum, Supervisor
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, 1919