

SURVEYING A BRIDGE SITE ON THE FEATHER RIVER LATERAL

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Table of Contents

	Page
Surveying Under Difficulties----- <i>By A. D. Hunting, Chief of Party</i>	1
How and Why Auto Accidents Take Place-----	2
The Hillside College of Santa Barbara----- <i>By Alfred Eichler, Architectural Designer</i>	4
The New La Canada Bridge-----	6
The Kings River Highway----- <i>By R. L. Beuthel, District Office Engineer</i>	8
Where Everything is "Skookum"----- <i>By H. R. Youngblood, Assistant Superintendent, California Highway Patrol</i>	10
The Ideal Traffic Patrol Schedule----- <i>By Victor W. Killick, Statistician, Division of Motor Vehicles</i>	11
California Autoists Pay Lower Fees-----	13
Elk Graze Along State Highway-----	13
The Scenic Skyline Boulevard----- <i>By Colonel John H. Skeggs, District Engineer</i>	14
Traffic Stripe on California Highways----- <i>By T. H. Dennis, Maintenance Engineer</i>	17
Consulting Board Named for Pasadena Dam-----	19
California Association of Highway Patrolmen----- <i>By John Sansone, Secretary-Treasurer</i>	20
Road Engineers From All Parts of World Meet at Washington-----	22
September Activities, Division of Water Resources-----	23
September Report, Division of Motor Vehicles-----	27
Progress on State Highway System-----	29
Architectural Awards-----	33
Water Applications and Permits-----	33
Dam Applications and Approvals-----	34



Surveying Under Difficulties

By A. D. HUNTING, Chief of Party

SOME of the difficulties that confront the surveyors of the state highways of California were recently revealed when an assignment came to survey the site for the east arch hinge of the bridge on the Feather River lateral at Pulga.

Upon arriving at the site of the proposed survey and looking over the prospect, the party was for a moment a trifle in doubt as to its ability to get just what was wanted. However, this was a case where the information must be obtained.

The portion of the site covered by the survey was that in the vicinity of the east arch hinge. This hinge falls upon the face of a cliff, approximately 100 feet high, varying in steepness from about a quarter to one slope to an overhang at one or two points. At the foot of the cliff is a ledge, sloping steeply toward the river. At the top of the cliff the hillside

continues on up abruptly enough to require a good deal of care in walking upon it.

The first problem to be solved was the method of obtaining the required data. As the centerline along the cliff is on a curve, whose beginning is inaccessible, the use of cross sections or profiles was discarded due to the difficulty in keeping readings on line. It was decided to locate the breaks in the ground and plot contours on a large horizontal scale. The small interval of two feet was used. From this map such profiles or sections as might be desired could be obtained. The accuracy desired and the large vertical angles that would be necessary rendered stadia unsatisfactory for the face of the cliff. However this method was used to some extent above the rim and at the bottom where readings could be taken nearly level. It was finally decided to take readings by direct

slope measurement with a 100-foot steel tape and vertical and horizontal angles.

Finding suitable points on which to set up the transit was in itself a problem. Four points were finally established and tied in to the centerline, one at the top of the cliff, one on the ledge at the bottom, one on a convenient razorback just south of the centerline, and one on a point of rock jutting out some 20 feet below the rim. This latter was in the shape of a rude triangle about four feet on a side and sloped too sharply toward the river for any comfort. When the instrument was set up, at first there appeared to be no room for the transitman. In getting down to the point on the ledge it was necessary to telescope the adjustable tripod legs and strap the instrument on the transitman's back, allowing him to descend over hand on a rope.

Two ropes were included in the equipment. One was



The transitman at work.



Getting down to the job.

an inch hemp about 125 feet long and the other a five-eighths inch line of about the same length. In devising means for the rodman to reach the various points on the cliff at which readings were desired, several methods were considered and discarded as too difficult or dangerous for the conditions encountered. A large amount of loose rock, in pieces from the size of a walnut to the size of a man's head, resting above the cliff and prone to fall on little or no provocation, rendered the work more hazardous. As many of these rocks as possible were kicked or rolled over the edge before beginning actual work. Great care was necessary throughout to avoid loosening others to fall on the man below.

Tying a man to the end of a rope and raising or lowering him would have been too awkward, and in this case impossible, as only one man was available to do the hoisting. Furthermore, a man's full weight on a rope sliding over the rock rim of the cliff might cut or fray the rope to breaking point or might loosen pieces of rock. On the other hand, the man who can climb or lower himself hand over hand on a rope for a hundred feet, pausing for frequent readings, belongs in a circus rather than on a survey party. Accordingly it was necessary to devise a means of supporting the rodman while giving shots or resting, as well as to guard him from slipping or from the possibility of a dislodged rock fragment stunning him or breaking his grip.

Finally both methods were used. An 8-inch pine tree above the rim served as the anchor for the large rope, which was hung over the cliff. The rodman tied the thong of the tape to the wrist, leaving both hands free, and raised or lowered himself hand over hand on this rope. The small rope was tied to him in such a manner that he was suspended upright in a form of rope cradle. The other end was passed through the ring in the end of an iron pin, conveniently set in a hole in the rock drilled by the crew who made core borings at the site. A turn or two of the small rope was then taken about the iron pin and used as a snub line. One man attended to this line, paying it out as the rodman descended or keeping all slack taken up as he ascended. When a point was reached by the rodman at which a reading was desired, or when he needed a rest, he signalled the snubber, who tightened up on the rope and held him until he was ready to move again. As the major irregularities in the face of the cliff were nearly vertical this method worked

How and Why Auto Accidents take Place Shown by Statistics

Drivers with two or more years of experience at the wheel figured in the greatest number of motor vehicle accidents in California during the first half of 1930 in statistics issued by the Division of Motor Vehicles.

The total number of accidents during the period was 14,213, resulting in the deaths of 1066 persons and the injury of 18,696. The experience of the drivers involved in the mishaps was listed as follows:

Two years or more, 12,673.
One to two years, 333.
Six to twelve months, 108.
Three to six months, 49.
Less than three months, 69.
Not stated, 8272.

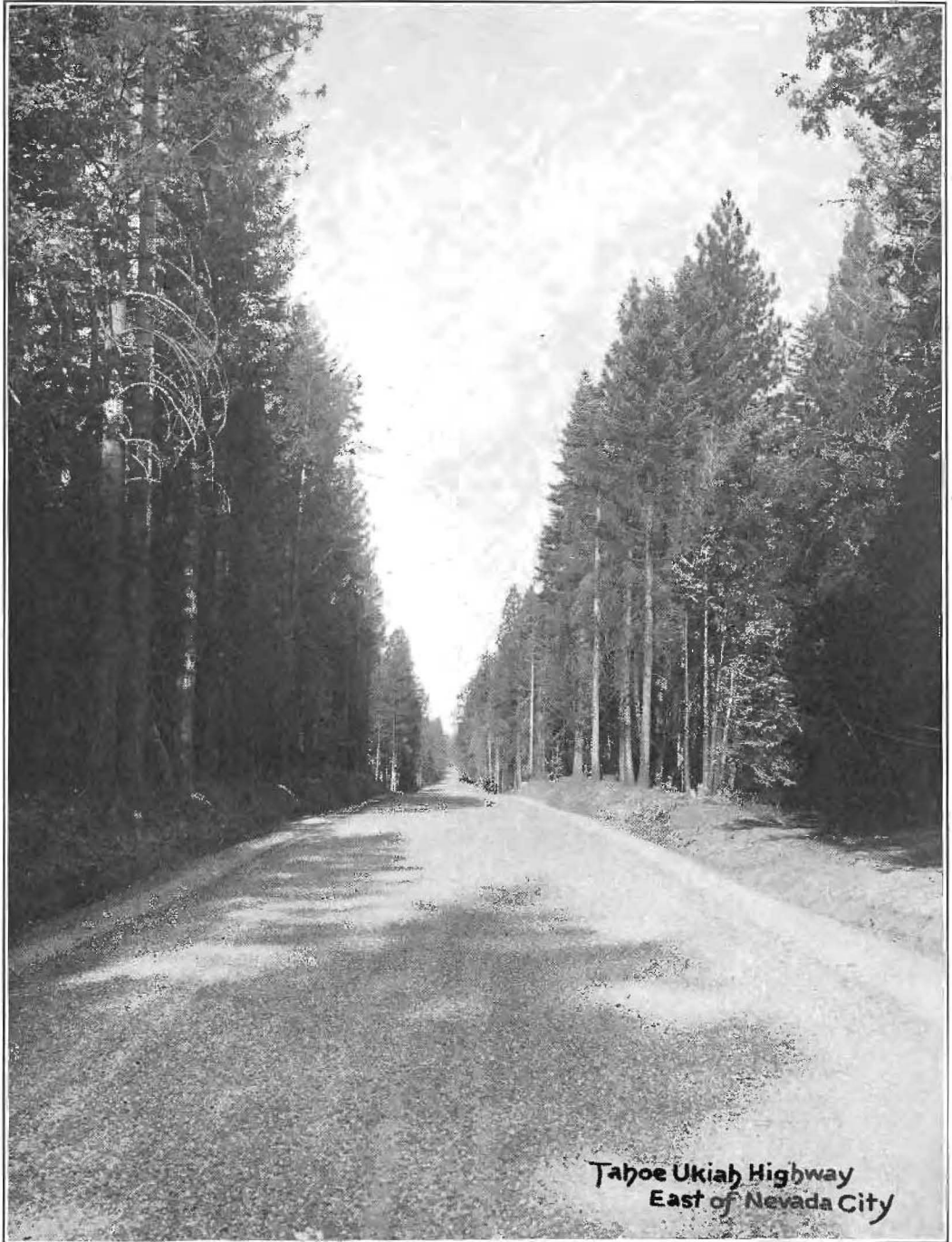
The "dangerous age" for motorists, according to the figures, is from 20 to 29 years, with 5296 drivers in that range topping the list, although somewhat offset by the fact that the age of the driver was not stated in 6014 cases. From 30 to 39 years came next with 3998 accidents, followed by 40 to 49 years in 2657 accidents; 50 years and over in 1908 cases; and the youngest class, 10 to 19 years, in 1631 instances.

In accidents for which the driver was definitely responsible leading causes were given as follows:

Did not have right of way, 3492 cases.
Exceeding speed limit, 2896.
Reckless driving, 1046.
Drove off roadway, 1004.
On wrong side of road, 943.
Skidding, 512.
Failed to signal, 165.
Cutting in, 161.
Car parked on roadway, 122.
Passing standing street car, 55.
Passing on curve or hill, 29.
Driving through safety zone, 25.
"Hit and run" cases, 534.

very well and more rapidly than would be expected. The rodman gave a series of readings from top to bottom, then moved over a few feet and gave another series as he climbed up. The only difficulty was in reaching the face beneath the overhanging portion. This was finally accomplished by swinging in and holding to a projection from the cliff.

By the methods described all the desired information was obtained with no mishaps other than stiff and sore muscles and voracious appetites.



Tahoe Ukiah Highway
East of Nevada City

The Hillside College at Santa Barbara

By ALFRED EICHLER, Architectural Designer

FOR picturesqueness of site and enchantment of outlook, Santa Barbara State Teachers College can hardly be excelled. On the steeply rising slope of Mission Ridge, a short distance from and overlooking the Old Mission, the college occupies several acres of irregular contour. The visitor's first view, on



ALFRED EICHLER.

arriving in the city, is a glimpse of delicately tinted stucco buildings nestling against a background of mauve mountains. A closer approach follows a winding drive up the mountain side through groves of tall eucalypti leading to what has been called the "Inspiration Point" of Santa Barbara. From the campus the city lies almost at one's feet; the glistening blue of the Pacific sweeps across the middle distance, dotted with the white of pleasure craft. Far on the horizon the rugged outlines of the channel islands peer dimly through the veil of the morning haze. In the immediate foreground lie the sentiment and historical association of the Old Mission. It is with this glorious aid of nature that the work of the Division of Architecture has been undertaken.

Of the seven state teachers colleges of California, all save two are situated upon level

or rolling ground. One of the hillside colleges is Santa Barbara.

It seems to be a matter that is generally understood that any group of buildings for a highly specialized purpose, such as a factory, a hospital or a school, should, by reason of utility and economy, be built upon level ground.

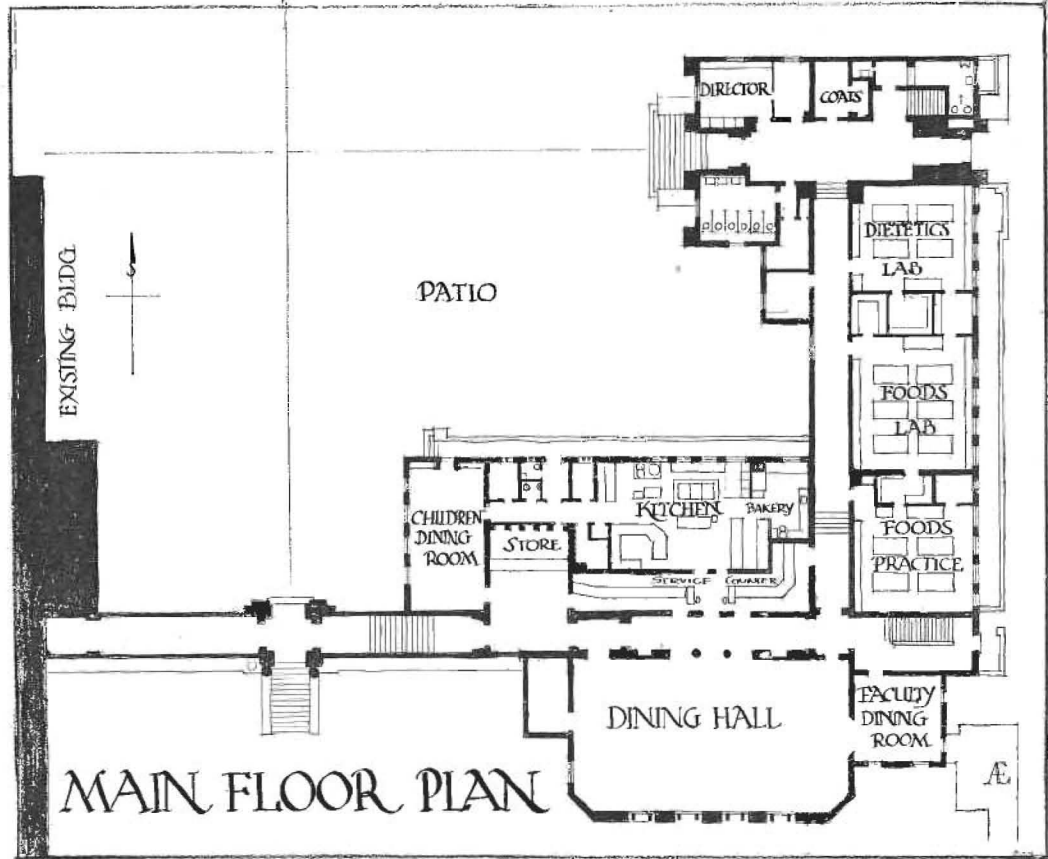
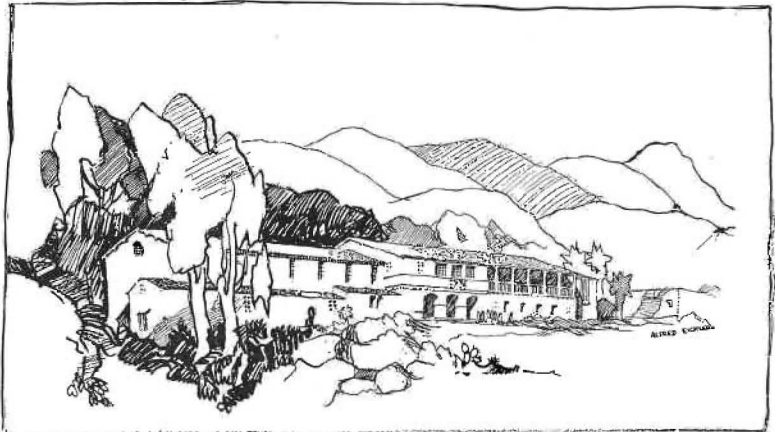
In years gone by, when these sites were acquired for what were then called the normal schools, no one had any idea of the way that these institutions would grow. Keeping pace with the population increase of the state, the small group of buildings of the Santa Barbara State Normal School has grown to be a teachers college with an attendance going into the thousands. Year by year new construction was initiated, to accommodate the growing number of students and to fill the needs of the advancing science of pedagogics. Finally, the time came when it was imperative to plan for the ultimate development of the college. It was found that the value of the plant already erected would require that the site be retained and future buildings correlated to the existing structures, all making a scientifically planned and harmonious whole.

It can not be denied that the layout of the modern educational institution is a complex affair with many ramifications in detail. The



An entrance, Ebbetts Hall of Domestic Arts.

General view of State
Teachers College at Santa
Barbara and main floor
plan.



problem is increased in a considerable measure when the site is an inclined plane, a steep and rocky hillside such as is the described.

This most beautiful location, therefore, presents practical problems in planning and construction. These problems have been approached in a number of ways.

The initial college structure was erected in 1912, and was the nucleus of the institution.

For a long time it housed the entire student body. It was remodeled in 1929 to adapt it to newer conditions. As a site for this building a place on the hillside was leveled off, with sloping terraces on three sides. The plan of this building is, therefore, the same as it would be for a building on level ground. In the further development of the college in recent years, however, it was impossible to use the

same methods of planning, as that would involve leveling off the mountain side. It remained, in studying the plans for the recent undertakings, to obtain practical results by other means.

The Administration Building was completed in 1928. The location selected for it is gently sloping at the east end, where the administrative offices are situated, and drops steeply at the west end, which is occupied by the auditorium. The sloping floor of the auditorium follows the slope of the ground. The difference in floor levels of the building is taken up in the entrance lobby, which is in the center of the building. The college library is on the second floor over the offices, with a reading balcony from which one may take advantage of the expansive vista. Over the main entrance archway is an altorelieve commemorating in sculpture the earliest inhabitants of the region, the Mission Indians.

The Ebbetts Hall of Domestic Arts was completed in 1929. This is a structure with an unusually involved plan, the functions of which required exhaustive research. The building primarily takes care of the college dining hall and kitchen, the Domestic Science Department, and the model bungalow. In connection with the dining hall are the kitchen, children's dining room and faculty dining room, all arranged for cafeteria service. The Domestic Science Department occupies

THE NEW LA CANADA BRIDGE



The above view is that of La Canada arch bridge, built on the Arroyo Seco Highway, approximately one-half mile north of La Canada in Los Angeles County. The bridge was constructed by the Whipple Engineering Company. Its cost was \$31,900.

nine laboratories and a sewing balcony. A room in the primitive colonial style, paneled in pine, and with a cavernous fireplace, serves as an exhibit room for this department.



Ebbetts Hall of Domestic Arts, Santa Barbara State Teachers College.

The slope of the hillside here was uniform, permitting three distinct levels for the three functions of the building. The model bungalow is on the first floor, the kitchen and dining hall on the main floor and the Domestic Arts on the highest level.

The setback in terraces as required by the stepped plan of the Domestic Arts Building blends well with a Persian feeling. In the Garadagh Mountains in Persia the clustered habitations are noted as interesting examples of side hill architecture.

Plans are now being drawn for another unit, the Science Building, which is to be ready for occupancy in the fall of 1931. This structure will house the science laboratories and lecture rooms, with necessary adjuncts, and will be fully equipped in accordance with the latest scientific methods. The studies will be Zoology, Botany, Physiology, Bacteriology, Physics and Chemistry.

This building, while entirely independent of the Domestic Arts Building will be so grouped with it as to form a patio. This patio will be stepped up the hillside in a manner reminiscent of the walled gardens of Urumiah in northern Persia. The botanical and zoological specimens will be arranged in the gardens to give them an entrancingly lovely setting.

The mass of this group will set back in terraces as required by the exigencies of the site. On the highest floor a lecture room will open on a loggia looking far off to the shimmering sunlit sea. Despite all this attention to the esthetic, and reminiscent as it may be of the ziggurats, the building nevertheless will not fail in any detail to meet the highest standards of efficiency, durability and economy.

A comprehensive plan for the entire institution is now in process of preparation which will locate all future buildings and provide space for recreation and athletics. Thought will be given that the magnificent possibilities of site and vistas be used to the fullest advantage.

When Timur-el-leng, the Persian ruler, commissioned his architects, he allowed them "One month to plan; one year to build; riches the reward of success; death for failure." The mortality among architects was high in those days, and few were laden with precious stones and gold. A study of the works of these ancient builders of Persia is invaluable, on account of the similarity to the topography and to the sunny climate of Santa Barbara. They also show the result of much

ingenuity prompted by the architect's urge to retain his head.

A modified Spanish type of architecture has been chosen by the community of Santa Barbara as best expressing the spirit of the locality. The Persian inspiration fits well into this picture; indeed from certain photographs of old world buildings not even the initiated can distinguish the locality so generally does a common feeling run through the primitive architecture of the Southern countries. In this manner with a touch of the exotic, monotony is avoided and a note of interest and variety added to the development of the community of Santa Barbara.

PURCELL ASKED TO SPEAK TO WASHINGTON GATHERING

State Highway Engineer C. H. Purcell has been asked to address the annual meeting of the Washington State Good Roads Association. Mr. Purcell has been asked to outline the work that has been accomplished in California highways during his administration as State Highway Engineer. The meeting will be held in Wenatchee on November 21st, and is to be attended by Governor Hartley of Washington, the highway commission of Washington and practically all the members of the legislature of that state.

PENNSYLVANIA REDUCES NUMBER OF "STOP" SIGNALS

As a movement toward eliminating many "stop-go" signals, the Pennsylvania Highway Department has ordered removed all traffic control lights on state highway intersections with a peak load of less than 500 cars an hour, and where fewer than 125 cars an hour approach the intersection from the side roads.

This is according to information furnished the California Highway Commission by the Pennsylvania authorities. The latter contended that these signals delay traffic rather than regulate it in places where travel is light.

POLITE PLUMBER

The gentleman had sent for a plumber to fix an upstairs tap, and as he and his wife started downstairs they met the plumber coming up. The gentleman said:

"Before I go downstairs I would like to acquaint you with the trouble."

The plumber politely removed his hat and murmured:

"Pleased to meet you, m's'am."

The esteemed *Literary Digest* is worried lest long skirts will increase traffic accidents, because the women can't move with their accustomed freedom of limb, but we believe that hazards will be offset by the men having their minds set more on driving than formerly. —*Georgia Highways Magazine.*

The Kings River Highway

By R. L. BEUTHEL, District Office Engineer

STATE Highway Route 41, in Fresno County, is a development of a scenic route which had its inception many years ago under the former State Department of Engineering. This department made surveys and constructed a road which led from the north line of General Grant National Park in the high Sierras, to Hume and about four miles beyond to Lockwood Creek. A survey, its objective being the Kings River Canyon (located on the South Fork of the Kings River), was carried down to the Kings River by a devious alignment consisting primarily of curves and switchbacks. Judged by present



Limestone cliff in which Boyden's Caves are located.

day standards such alignment would be pitifully inadequate but it should be remembered that motor transportation was decidedly in its infancy in 1908, and for some years following. Reference is made in the old survey notes of turnouts for teams and wagons and obviously the engineers were planning primarily for horse drawn traffic.

Chapter 232, Statutes of 1909, brought the Kings River road into the state highway system, and it has been under maintenance



Dayder's Cave on Kings River Highway.

only, until the spring of 1929. A day labor convict camp was established in June of last year and construction on a modern standard has been in progress since that date.

The new route follows approximately the old road from the north line of General Grant National Park northerly to Cherry Gap, a distance of $1\frac{3}{4}$ miles. At this point the highest elevation on the Kings River road is reached, being 6790 feet above sea level.

Here the old road and the new divide, the



Steam shovel at work.

old route following the east slope of Indian Creek and the new road proceeding northerly on the west slope passing three vistas of pine, fir and other varieties of trees. The road follows a descending grade with easy curves, and enchanting glimpses of the high Sierras are opened to view. Through Indian Basin are large stumps and other evidences of lumbering operations which ceased some years ago.

Northeast of Indian Basin stands the Boole tree (accessible by auto and about two miles

mately thirty free men constitute the maximum force which has been maintained to date. Two Diesel powered shovels, of one yard and $1\frac{1}{4}$ yard capacities, are the major items of equipment, and are supplemented by compressors, drills, trucks, graders, tractors, etc.

Leaving the camp the road continues along the west slope of Indian Creek for about half a mile, at which point the drainage basin of Indian Creek widens abruptly, forcing the location to turn northwesterly in order to secure support. Precipitous slopes require



Entrance to Kings River Canyon.

of trail), which is said to be larger than the General Grant tree in the National Park.

At the lower end of Indian Basin lies the construction camp which houses the force of convicts and free men engaging in building the new road. The camp site is quite attractive, having a plentiful supply of cold spring water, surrounded by large trees and sheltered from winds. A level spot in Indian Basin has provided a site for a baseball diamond on which games are played by teams organized from the camp inmates.

One hundred twenty convicts and approxi-

benching or shelving the roadbed or walls where the roadway is partly on fill. Very hard rock has been encountered which has materially slowed progress.

As the descent is made from camp, on grades varying from 5 per cent to 7 per cent, each turn brings into view, more clearly, the high peaks, some of which are over 13,000 feet in elevation, the canyon of the middle fork of the Kings River, and the precipitous sides of the river canyon. Realization of the immensity of the terrain is difficult of comprehension.

(Continued on page 21.)

Where Everything is "Skookum"

By H. R. YOUNGBLOOD, Assistant Superintendent, California Highway Patrol

(This poem is reprinted from the September issue of *The National Motorist*.)

On a trip through the north
We motored this year,
As far as Vancouver,
And what names we did hear.

We went through the Redwoods,
Kept the coast all the way,
Then turned east at Bandon
Near the mouth of Coos Bay.

As we passed the Willamette
What names there we found,
When we crossed into Washington
And around Puget Sound.

Cathlamet and Kalama
Then came Chehalis,
Santiam, Wahkiakum,
Multnomah and Copalis.

Pe Ell and Palouse,
Yamhill and Snohomish,
Skagit and Skapoose,
Wenatchee and Skykomish.

Chuckanut and Chilliwack,
Cowlitz, Puyallup,
Toppenish, Moclip,
Tulip and Humptulip.

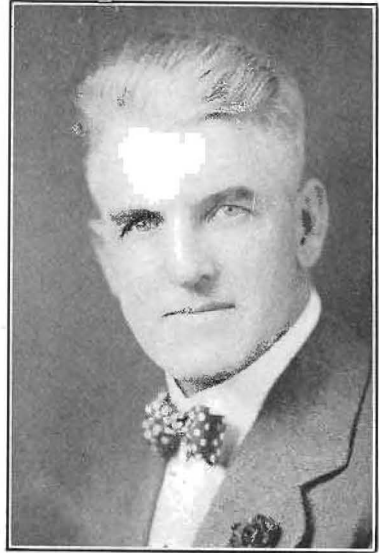
Anacortes, Kapowsin,
Nisqually, Capilano,
Kittitas, Chemainus,
Cle Elum, Kitsilano.

Clatsop and Satsop,
Mukilteo, Montesano,
Quinalt, Esquimalt,
Tenino and Nanaimo.

Then we passed through Issaquah,
Enumelaw, soon Willapa,
Skamania, Skamokawa,
Siskiyou and Suislaw.

Hoquiam and Cowitchan,
Okanogan, Shawnigan.

Toppenish we next did pass,
Cosmopolis and then Camas,
Stillaguamish, Steilacoom,
Umpqua and Sumas.



H. R. YOUNGBLOOD.

Callapoya, Santiam,
Coquille and Clackamas,
Lilliwap and Tillamook,
Enough queer names to fill a book.

We're glad to be at home again,
With easy names to say
Like Sausalito, San Joaquin,
Milpitas, San Jose.

Petaluma, Pescadero,
La Jolla and Mojave,
Why don't those places way up north
Have names that folks can savvy?

Government experts say you can buy more with a dollar now than you could this time last year, and what we hope is that they are now at work on a bulletin telling where to get the dollar.—*Macon Telegraph*.

"Hello, Bill, I haven't seen you for weeks! But what's wrong? You're lookin' seedy. Been ill?"

"No, I ain't been ill, it's work what's doin' the harm—work from eight in the mornin' till six at night, and only one hour off. Think of it!"

"Awful! And how long have you been there?"

"I ain't been there yet. I begin tomorrow."

—*Illinois Central Magazine*.

The Ideal Traffic Patrol Schedule

By VICTOR W. KILLICK, Statistician in charge of Bureau of Research, Statistics and Traffic Safety of the Division of Motor Vehicles

WHEN is a traffic officer needed most? Every chief of police and the Superintendent of the California Highway Patrol knows that motor vehicle accidents increase in some direct proportion to the congestion of vehicles on roads and streets.

Of course, it is relatively a simple matter to provide extra patrols for special occasions such as big ball games, parades and conventions when it is a foregone conclusion traffic congestion will be acute. But what about the every day habits of the average motorist? Is he not as much a creature of habit in his driving each day as he used to be when a mere pedestrian?

If so, perhaps, there may be some sort of fundamental law, or cause, underlying most traffic accidents, which, if it could be accurately understood, might serve a valuable purpose in determining exactly when the traffic cop is most needed—when he can do the most good.

The Research Bureau of the Division of Motor Vehicles undertook to study the matter. The problem was attacked from several angles. The plotting, in chart form, of the hours of occurrence of motor vehicle accidents gave the clue. This chart plainly shows that a very critically dangerous period for motorists definitely exists every day in the year for the six hours between 3 p.m. and 9 p.m.. The indications are that this "critical period" operates as a law. It is a constant recurring condition. It is the same for 1928 as for 1929 and for the half of 1930.

All traffic officers in and about large cities know only too well that traffic congestion is always acute about 5 p.m. But relatively few executive officers of police departments realize that there exists a continuous period of six consecutive hours extending definitely from 3 p.m. to 9 p.m. when they should have

not only full strength patrols on duty but such patrols should be reinforced with extra men.

The research survey has clearly brought out the need of this action. It has shown that traffic accidents in the "critical period" are more than twice as frequent as at any other corresponding period of the day, not including the same hours.

The Research Bureau recommended an "ideal patrol schedule," particularly applicable in and about cities having population of 100,000, or more. It is in such cities, and in a zone not exceeding five miles therefrom, that 68 to 70 per cent of all traffic accidents involving injuries to persons arise.

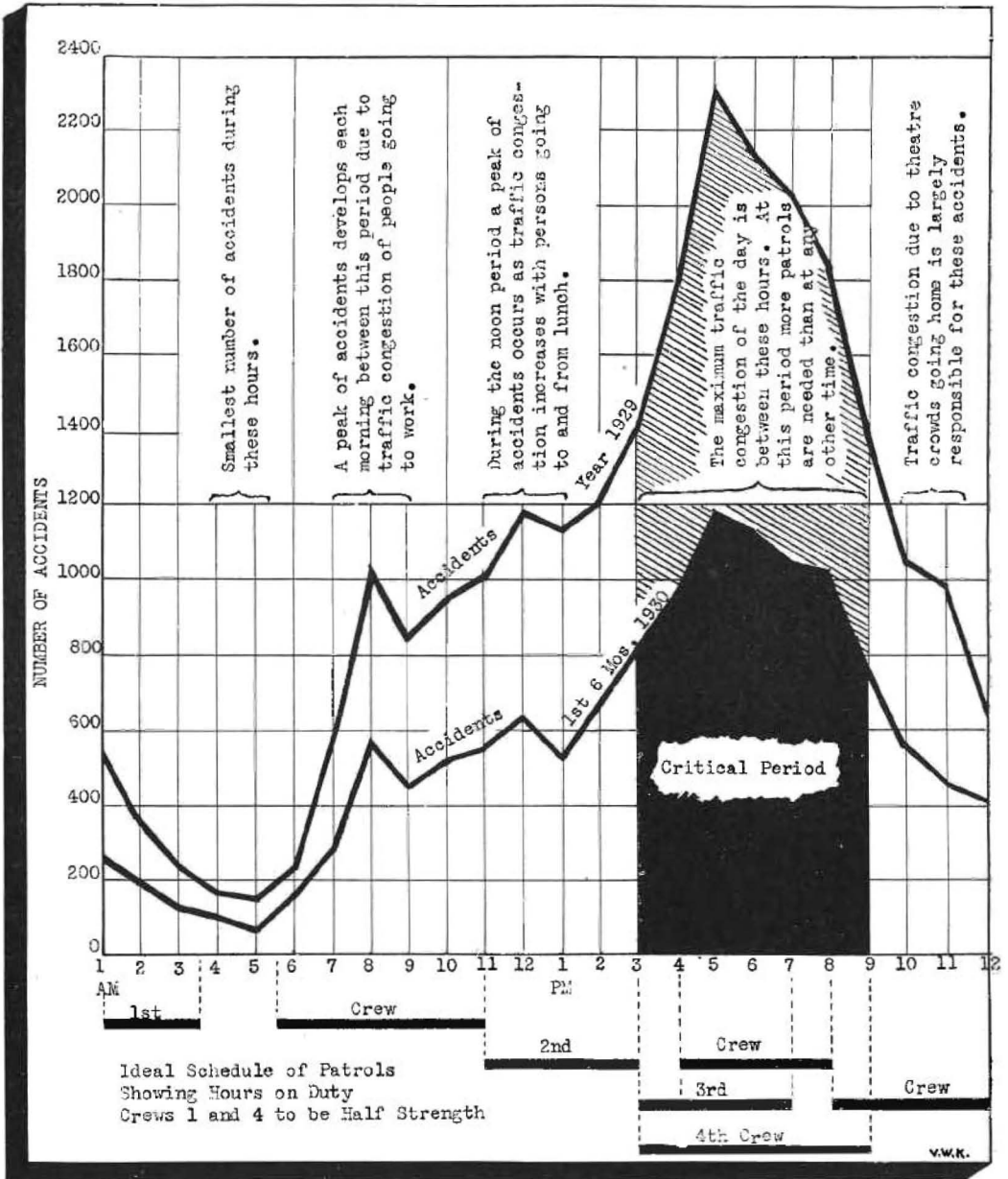
The "ideal schedule" is a target—something for chiefs of police to "shoot" at. It may not be physically possible for all of them to literally carry it out, but it is based upon the theory that the closer they get to it the more certain we will be to witness a decline throughout the state in the number of accidents now occurring within the "critical period" hours.

The "ideal schedule" provides for three equal sized groups of patrol officers to be subdivided into four working crews. The first crew, a half strength crew, goes on duty from 1 a.m. to 3 a.m., is then off duty until 5.30 a.m. and continues until 11 a.m. Crew two, a full strength crew, starts its shift at 11 a.m., runs until 2 p.m., is off an hour and continues on duty until 8 p.m. Crew three, full strength, starts at 3 p.m., continues to 7 p.m., is off an hour and resumes duty from 8 p.m. to 12 p.m. Crew four, a half strength crew, is a reinforcing crew. It operates straight through for six hours from 3 p.m. to 9 p.m.

The schedule provides for day and night patrols throughout the twenty-four hours, excepting only a two-hour period in the early morning between 3.30 and 5.30 when traffic

TRAFFIC TOLL

	1929	First six months 1930
Total Motor Vehicle Accidents.....	26,921	14,213
Total Fatal Accidents.....	2,047	971
Total Nonfatal Accidents.....	24,874	13,242
Number of Persons Killed.....	2,244	1,066
Number of Persons Injured.....	35,443	18,696



congestion is minimum. It provides for a patrol service of one and a half to two and a half times normal strength through the entire six-hour "critical period." During the three most dangerous hours of the day, as shown by the chart, between 5 p.m. and 8 p.m. the patrols are at maximum strength.

Chiefs of police in several cities to whom the study was presented have expressed emphatic appreciation of the suggestion. Some will apply the schedule literally. Others

are working out adjustments in their present schedules to get closer to the "ideal." During the current and coming months the Bureau of Research of the Division of Motor Vehicles will attempt to measure the effectiveness of the results of this suggestion statistically.

Tramp: I'm hungry. I got an awful headache.
 Cook: What you need is lots of exercise. Why don't you take our axe and get at our wood pile?
 Tramp: I ain't got no splitting headache.

California Autoists Pay Lower Car Fees Than in Other States

RESULTS of a nationwide economic survey announced here by the California Division of Motor Vehicles show Californians are paying less in fees for the privilege of operating motor vehicles than motorists of most of the other states and are enjoying superior advantages.



VICTOR W. KILLICK.

Of twenty-five states visited by Victor Killick, statistician and research engineer of the department, in making the survey, not one had a registration fee as low as the \$3 flat fee charged in California for registration of passenger vehicles.

Most of the states were found to be still employing the old horsepower rating system or scheduling their fees on a weight basis. Under these systems fees were found to range from \$8.80 for light vehicles to \$30 and \$40 for the larger and heavier types.

In one state the registration of a heavy vehicle used for commercial purposes was found to cost between \$450 and \$500 annually.

It was found that practically every state makes an annual charge to applicants for licenses to operate motor vehicles and some make a further charge for examination of such applicants. These fees were found to range between \$1 and \$2 a year; motorists of some eastern states paying a total as high as \$5,000,000 for such licenses and examinations.

California applicants for operators' licenses pay no fee whatever and are examined free of charge. Although the law requires that licenses be renewed every two years there is no charge for renewal, as in many states.

Killick learned that in one state motorists

ELK ALONG THE HIGHWAY



The above picture shows a herd of elk as photographed along the Tahoe-Ukiah Highway on Bear Creek in Colusa County.

whose licenses are revoked may obtain a hearing before the commissioner of motor vehicles only upon payment of a fee of \$5 in advance. In California every motorist is entitled to a hearing without cost.

The motorist registering a motor vehicle in California for the first time receives a title certificate (pink slip) without extra charge, if he be the legal owner and if he is not the certificate is mailed to the legal owner without added cost.

Many states were found by Killick to be exacting a fee of \$1 for this certificate. Fees for the transfer of ownership of cars were found to be from 60 to 100 per cent higher than in California.

California motorists paid an aggregate of some \$10,500,000 in 1929 for registering their cars. New York motorists, however, with only a few thousand more cars, paid \$38,250,000 for the same service while Pennsylvania motorists, with less cars, paid \$29,250,000.

All the states visited by Killick employ the gasoline tax. Twenty were found to have a

(Continued on page 18.)

The Scenic Skyline Boulevard

By COLONEL JOHN H. SKEGGS, District Engineer

THE Skyline Boulevard, Route 55 of the state highway system, was primarily designed on a basis of utility; first, it was planned to serve the heavily settled urban territory south of San Francisco as a relief to the overburdened El Camino Real, or Peninsula Highway, for ingress and egress to and from the city of San Francisco; second, it offered facilities for a faster express route to the city of Santa Cruz and Monterey coast points by by-passing all the towns en route and avoiding the ensuing delay occasioned by congestion due to cross traffic and commercial settlements; third, it provided quick and easy access to the coast territory and the many resort sections on the west slope of the coast and Santa Cruz Mountains; and fourth, it served the intensively cultivated agricultural sections just outside of San Francisco and the stock and small fruit ranches through which the Skyline Boulevard passes further south, as a commercial road for transporting their products to market.

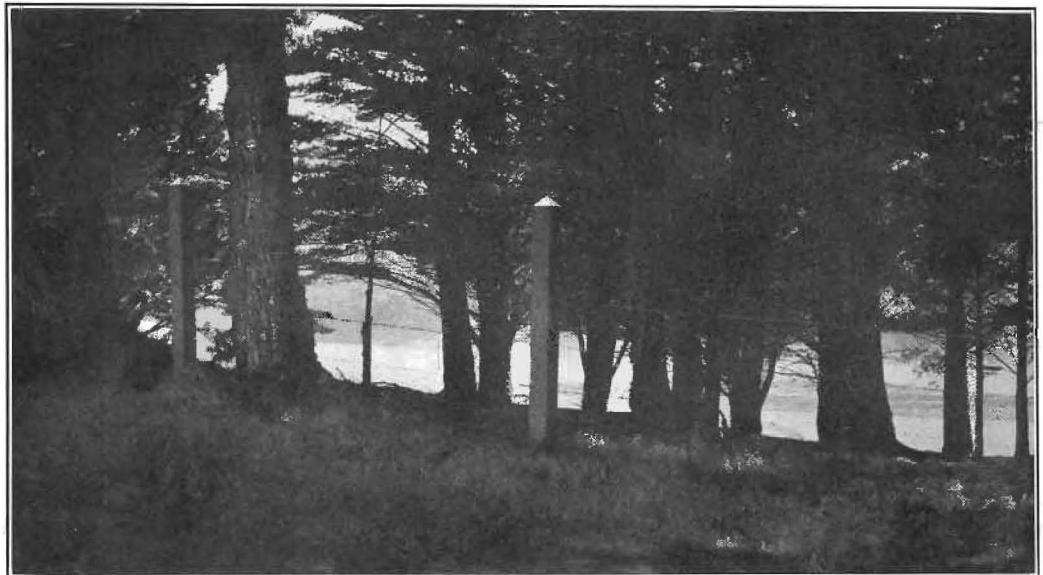
SHIFTING PANORAMA OF BEAUTY

Although basically the Skyline Boulevard is a road of utility it is also a highway of scenic beauty. Briefly stated, the scenic attractions of this splendid road in the forty-

eight miles of state construction completed at the present time comprise four miles affording various views and glimpses of the ocean, one mile passing beautiful Merced Lake, fourteen miles in which Crystal Lake is the dominant scenic feature, twenty-four miles affording magnificent panoramas interspersed with brief glimpses of the valley and San Francisco Bay, and several miles passing through three different golf courses, where natural and artificial beauties are harmoniously blended.

APPROACH THROUGH SAN FRANCISCO HIGHLANDS

The approach to the Skyline Boulevard through the highlands of San Francisco is extremely pleasing. One mile from the end of Market street on Portola drive the first three-quarter-mile view is had of the bay to the southeast, after which the traveler proceeds through the pretty, green Twin Peaks residential district to the intersection of Junipero Serra and Sloat boulevards. Proceeding for two miles along the wide double Sloat Boulevard with the foliage of the Municipal Playground on the left, the intersection with the Great Highway and the beginning of the Skyline Boulevard is reached. Here the street car tracks tunnel



View of Crystal Lake as seen along the Skyline Boulevard.

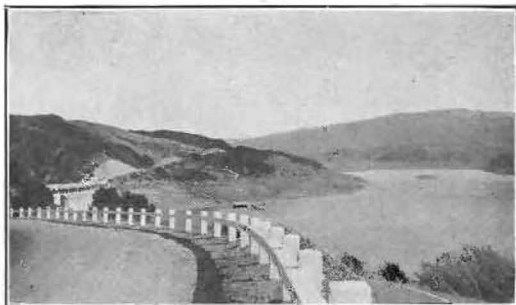


Map showing the Skyline Boulevard.

under the large intersection, leaving it unhampered for automobile traffic.

GLIMPSES OF THE OCEAN

Progressing along the Skyline Boulevard the ocean may be viewed from near sea level either from the highway or from a spacious observation point on the right. A pleasing view of Fleishhacker's large and happily crowded swimming pool is had, after which



The road over Crystal Lake.

the parked areas of Fort Funston on the right and Harding golf links on the left are traversed. An interesting short side trip into the golf links is here offered with branches of Merced Lake viewed first from one side, then the other, in enjoyable variety. For a distance of one mile from the entrance to Harding golf links, Merced Lake is seen through the trees and heavy foliage on the left, after which the climbing highway for another mile passes through the grounds of the Olympic Club golf course on either side with perfect harmony of artificial and natural beauty, from which section the ocean may be viewed on the right below. From here the ascending road passes through truck garden fields for several miles, where the first real magnificent view of the valley and San Francisco Bay is sighted directly ahead along the highway.

CRYSTAL SPRINGS LAKE

About ten miles out on the Skyline Boulevard the first fleeting glimpse of Crystal Springs Lake on the right is had, while a panorama of the bay is enjoyed at the same time on the left.

At fourteen miles on the highway the last panorama of the bay is snatched away as the motorist enters the grounds of the Crystal Springs Country Club, the golf course of which is enjoyed on the right for the next mile and a half. The ensuing three miles traverses the shores of Crystal Lake, the highway crossing directly over the interlocking concrete, earthquake-proof dam with its unique observation point and memorial to Schussler, its builder.

From the earth dam, which divides Crystal Lake into two parts, the highway climbs two miles to the Half Moon Bay road, where Crystal Lake, now far below, and a panorama of San Francisco Bay across the intervening hills can be viewed at the same time.

The next four miles of the ascending highway affords a glimpse first on the right of the Pacific Ocean, then a glimpse of Crystal Lake and the bay on the left, each view being withdrawn before the full import of the beauties shown can be realized, the last half mile of this section affording a wonderful, broad panorama of the bay and valley on one side, immediately followed by equally as imposing a view of the ocean on the other.

THROUGH THE FORESTS

At this point the motorist is suddenly relieved from wide views and plunges into the cool, refreshing shade of the timber with a teasing glimpse of the bay now and then

afforded through the trees on the east side of the highway. This five-mile stretch of road passes through a timber belt on Kings Mountain comparable to the heavy stands of Humboldt and Mendocino counties.

INSPIRATION POINT

Approximately thirty miles out, the traveler reaches Inspiration Point, from which place the entire valley and San Francisco Bay spread out below, with a background of mountains east and north of the bay, revealing Mount Tamalpais, Mount Diablo and Mount Hamilton.

The next seven miles of highway is a typical mountain road with fleeting though often unsatisfying glimpses of the bay and valley on the left, alternated with beautiful views of the Santa Cruz Mountains on the right, after which four and one-half miles along the east side of the ridge give an almost uninterrupted panorama of the bay and valley on the east. The mountains on the west are the dominant feature from here to Saratoga Gap through which, however, a framed picture of the valley on the left may be had.

THIRTEEN COUNTIES FROM ONE POINT

Three miles south of Saratoga Gap on the proposed but as yet unconstructed fourteen-mile section which connects with State Highway Route 5 between San Jose and Santa Cruz, Castle Rock Ridge, the highest point in the Santa Cruz Mountains, is reached, from the summit of which on a clear day thirteen counties, the Monterey coast and the Farallons can be seen at one and the same time. The government Rangers' station and observation point is located upon this mountain.

FAIRYLAND OF LIGHTS

The beauties of the Skyline Boulevard can not be fully appreciated by traveling it in one direction only. The trip from Saratoga Gap toward San Francisco is particularly impressive at night, with the thousands of twinkling lights throughout the valley and the illuminated transbay bridges, ferries, etc., in the bay, making impressions which are not easily forgotten.

THE BEAUTY OF THE FOG

Due to the fact that this highway is located along the summit of the mountains, particularly on the Santa Cruz end, fogs often occur far below the level of the road and especially on a moonlit night this presents a sight of such rare silvery beauty as to be incapable of description.

It is seldom that one highway combines the

beauties of the mountains, the sunsets of the desert, the fogs of the ocean, the panorama of a great historical bay and the magnificent urban valley of a large city in as many varying phases by daylight or starlight, and only those who travel it many times ever learn the full potency and charm of the scenic Skyline Boulevard.

EASY OF ACCESS

Although the distance from San Francisco's central business district to the Skyline Boulevard is greater than that to the Peninsula Highway, the latter, inside the city limits of San Francisco, has some three dozen cross traffic streets in a continuous busy commercial district. About one-third of these are equipped with "Stop and Go" signals. This is in contrast to the approach to the Skyline Boulevard by way of the wide Portola and Sloat boulevards, where cross traffic is almost negligible. Additional access is had to this important state boulevard from all parts of San Francisco through direct connections to Market street, Twin Peaks and Junipero Serra boulevards, Nineteenth avenue and the Great Highway along the ocean shore.

The Skyline Boulevard without becoming involved in cross traffic taps the Peninsula interurban territory with improved lateral roads at Colma, at San Bruno and at Millbrae, each two miles east of the highway; also at Burlingame and San Mateo, each four miles, and at Belmont five miles east. Woodside and Redwood City are served by two roads from the Skyline; Palo Alto, Mountain View and Los Altos also have a connecting road, and Saratoga, seven miles east of the Skyline Boulevard, is reached by an excellent county road recently brought to a higher standard, involving much heavy construction work.

The through route to Santa Cruz is accomplished at this time by a connection at Saratoga Gap, the present terminus of Skyline construction, with State Highway Route 42, which joins with excellently paved Santa Cruz County roads passing through the town of Boulder Creek and on to Santa Cruz.

WORK UNDER WAY

Upon completion of the fourteen-mile unit of the Skyline Boulevard between Saratoga Gap and Woodwardia upon State Highway Route 5 between San Jose and Santa Cruz, this improved condition will be accentuated and travel will proceed from the heart of San Francisco to Santa Cruz on a road of the highest standard at an uninterrupted rate of speed

(Continued on page 19.)

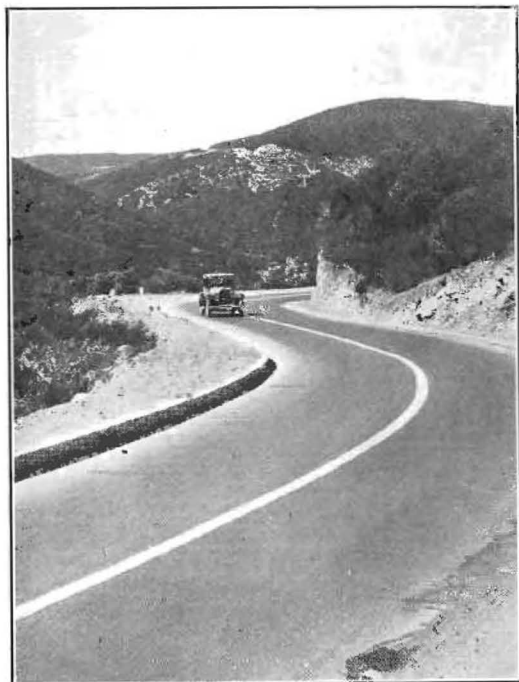
Traffic Stripe on California Highways

By T. H. DENNIS, Maintenance Engineer

DURING the year 1929 some 1800 miles of California state highways have been striped for the safety and convenience of traffic. The work was first initiated as a state-wide program in 1926, when a special crew was organized. In 1927 some 300 miles of traffic line was placed on curves and on the most heavily traveled routes. The work was extended in 1928 and the 1929 program is being repeated in 1930.



How the highway stripe is made.



Striping the highway makes mountain driving much safer.

It is planned to further extend this safety measure and estimates have been prepared to provide for striping 2200 miles of pavement or the equivalent of 3500 stripe miles annually for the 1931-1933 biennium.

PROMOTES SAFETY

It is felt that this safety measure more than justifies the considerable annual expenditure which is necessary. On unmarked roads many drivers feel that they are entitled to crowd to the center of the road, particularly on the more narrow, dangerous mountain

sections. For such drivers the white traffic line is a constant reminder to hold to their own side of the road and also relieves the tension of timid ones who may now watch the line instead of the edge of the pavement on the shoulder. Driving at night or in foggy weather is found to be much easier and safer with the guiding aid of the traffic line and all traffic is speeded up without increased hazard.

VALUE OF WHITE LINES

When the work first started a line six inches wide was placed, and white, orange and yellow paints were used at various points. The present standard line is four inches wide and white traffic lacquer is used exclusively. The white has better visibility at night and also as the line gets old. Lanes ten feet wide are standard, although 18-foot pavements are also striped. On the narrower pavements stripes are placed only on narrow bridges, on curves and other danger points. Stripes are placed along the pavement edges in foggy areas and also where the pavement edge is



Traffic lanes leading into a California city.

not well defined as on loose oiled shoulders where the similarity in color otherwise prevents the driver from determining the limit of the pavement, particularly at night.

HOW LINE IS PLACED

Where a new line is placed, care is taken to mark the line out ahead of the painting to insure a true uniform job. Small irregularities in the line are greatly magnified to the critical eye and the extra expense of this detail is well worth the effort.

Seven special crews are now assigned to the work. The usual crew consists of three men, a paint machine operator, a truck driver, and a helper who places and picks up flags used for protecting the line and also assists in mixing the lacquer.

The paint machine is a hand propelled spray outfit operated by compressed air. A screen side truck is provided for transportation of men and supplies.

QUALITY OF PAINT

In the early stages of the work, a white paint, made up according to state specifications, was used, but for the past two years commercial traffic lacquer has been used. Before purchases are made, samples are submitted by the vendors and tests are made in the laboratory, and results compared with similar tests on material which has previously given satisfactory results.

For best results, the white lacquer must furnish the maximum amount of opacity and visibility. It must dry rapidly so that traffic will not be inconvenienced or the pavement marked by machines tracking the line. It must be uniform, must provide a good film and spread, and it must be enduring.

Where a uniform edge of pavement is exposed or where longitudinal joints are in proper position, the line to be painted may be located by an outrigger attachment or the expansion joint followed. Generally, however, it is necessary to mark out the line in advance. This is accomplished by means of a one-half inch rope, about 300 feet in length, which is placed in the position desired by measuring from edge of pavement or by eye, as local conditions require. Spot marks are made with paint at intervals of two or three feet along this line. If the spot marks are too far apart the operator has difficulty in following them and an irregular line results.

GUARDING AGAINST TRAFFIC

Lacquer is purchased in five-gallon cans. It is mixed with thinner in the tank of the

spray machine, which holds eight gallons. The particular material used this season requires 3/10 gallon thinner to one gallon of lacquer to work through the machine. Air pressure used varies from 15 to 20 pounds. The machine is pushed by one man. The truck follows immediately behind, straddling the line as a protection to the machine operator. The other man in the crew sets a flag on the line at intervals of about 100 feet. These flags are supported by bent wire or small pipe stands with "X" bases.

When a tank of lacquer is run out, the operator and helper mix a new lot and the truck is sent back to pick up the flags. The lacquer dries in about ten minutes time after being spread. Even with the flags in place, it is difficult to keep machines off the line and it is usually necessary to secure aid from the local traffic officers to prevent tracking up the pavement. For marking line along the edge of pavement, an offset has been arranged to permit the machine to ride entirely on the pavement. It is not possible to secure a good line with one wheel on the shoulder.

About 12 gallons of lacquer and 3.6 gallons of lacquer thinner are required for each mile of 4-inch line. The average cost is \$40 per stripe mile. The lines are placed before the beginning of the winter season to secure maximum benefit. In general, a line is painted only once a year, although where traffic is heavy or conditions especially dangerous, the lines are renewed every six or eight months.

CALIFORNIA AUTOISTS PAY LOWER CAR FEES THAN IN OTHER STATES

(Continued from page 13.)

4-cent tax which is one cent higher than California. Nine have a 5-cent tax and three have a 6-cent tax.

In several states it was found gasoline taxes are diverted for general administration expenses or schools and other purposes, the motorist thus being compelled, as a class, to support various functions of government in addition to road construction.

The California motorist gets the full benefit of the gasoline tax inasmuch as all of it is spent on the highways.

OHIO—Fatalities due to automobile accidents in the state of Ohio increased 25 per cent during January and February, 1930, as compared with the same months for 1929, according to a report filed by the Chief of the Division of Vital Statistics with Dr. Charles A. Meal, Director of Health.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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

B. B. MBEK.....Director
 GEORGE C. MANSFIELD.....Editor

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

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OCTOBER, 1930

No. 10

Consulting Board Is Named to Advise on Pasadena Dam

The city of Pasadena, through its chief engineer, filed application with State Engineer Edward Hyatt, in accordance with the law governing the supervision of dams, on September 30, 1930, for approval of plans and specifications for construction of the Pine Canyon Dam to be built on the San Gabriel River. As provided for in this law, it is mandatory that the State Engineer cause an examination to be made of the site, review the plans and specifications, and approve or disapprove the application.

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

These nationally known consultants, possessing unquestioned ability and integrity, are preeminently qualified and widely experienced in their respective professions. They are to complete an intensive examination of the site of the proposed work and comprehensively review all technical phases of the proposed dam. The results of their investigation, together with their conclusions, will be embodied in a report to the State Engineer upon the safety features of the dam.

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

The Pine Canyon Dam will also be under the jurisdiction of the U. S. Forest Service, and the Federal Department through Mr. E. W. Kramer, Regional Engineer, will cooperate with the state in the investigation.

THE SCENIC SKYLINE BOULEVARD

(Continued from page 16.)

approaching the maximum allowed by state law.

Connections to the coast towns of Salada, Montara and Princeton are had from the Skyline Boulevard at a point approximately twelve miles from the Civic Center of San Francisco. Sixteen miles beyond this point the Half Moon Bay road, now under process of reconstruction and improvement by San Mateo County, affords connections to Half Moon Bay and Pescadero, on the west coast. Thirteen miles further on, the La Honda Road proceeds west to La Honda and San Gregorio. At Saratoga Gap there is a far more important connection via the Big Basin state road to California's largest state owned park, comprising 10,000 acres in the heart of the Santa Cruz Mountain redwoods, fifteen miles west.

The surpassing beauty of this mountain redwood section is fast becoming recognized as is evidenced by the heavy increase in the number of visitors to the park yearly; the past season as many as five thousand people visiting the park on holidays. Construction work now in progress between Saratoga Gap and Big Basin, due for completion in early 1931, is expected to further increase this number of visitors in the coming year.

The Skyline Boulevard passes through about seven miles of territory in the north end of San Mateo County which is devoted to intensive truck gardening, seeking San Francisco as a market and requiring almost daily use of the highway for a greater portion of the year. The many small stock ranchers and farmers south of this intensively cultivated section, although less in number, find the use of the highway equal in importance to that of the regions closer to the city.

NATIONAL—Secretary of Commerce Lamont estimates that highway construction this year will afford employment for probably more than 500,000 men. This estimate is based on the return of construction contracts awarded in the various states.

California Association of Highway Patrolmen

By JOHN SANSONE, Secretary-Treasurer

THE California Association of Highway Patrolmen is an organization composed of bona fide traffic enforcement officers throughout the state and its various cities and municipalities. Today its roster shows 348 paid-up members, compared to the 21 motor



HENRY LIVINGSTON,
President, California Association of Highway Patrolmen.

officers who organized the association in San Jose, California, on September 15, 1920. On June 15, 1929, the association was incorporated under the laws of the State of California as a nonprofit organization, acquiring state recognition and all legal rights of a corporate body.

The purpose of the association, primarily, is to devise ways and means of furthering the best interests of its members. Toward this end, a fund has been created out of which the sum of \$1,000 is paid to the widow, orphans, or dependents upon the death of a member. Traffic officers are classified by a majority of the old line insurance companies as being employed in an extra-hazardous occupation, and by reason of this fact, accident and life insurance policies for these men require the payment of a large premium. The association is at the present time carrying its own insurance, although plans for group insurance are in the offing. The only fees are the \$6 annual dues, and an assessment of \$2 whenever a member passes away. An initiation fee of \$10 is paid upon a member's being admitted into the association.

Prior to every legislative session, the association has gone on record as recommending the passage of certain proposed amendments to the motor vehicle regulations. This is another purpose for which it is organized, and since its members are engaged in the business

of enforcing motor vehicle laws, it naturally follows that the association is vitally interested in legislative enactments affecting such laws. It is reasonable to assert that traffic officers are highly qualified to decide whether proposed changes in the statutes, which have been thrashed in theory by the state legislators, are feasible in actual application. The position of the traffic officer was recognized by the California Safety Conference when the president of the association was elected to the board of directors of the conference, which was organized early in 1929 for the purpose of conducting educational campaigns among the motoring public and sponsoring favorable motor vehicle regulations. Due to a mutual interest in the solution of certain road problems, a splendid cooperation exists between state traffic officers and the personnel of the State Highway Commission. The board of directors of the California Association of Highway Patrolmen has seen fit to commend officially the Department of Public Works for



JOHN SANSONE,
Secretary-Treasurer, California Association of Highway Patrolmen.

its activities in aiding the motorist and in minimizing the number of automobile accidents.

The association meets as a body once a year in annual convention. It meets this year at the Hotel Del Monte for three days, October 21, 22 and 23. A lively program has already been prepared by the Convention Entertainment Committee, which includes sight-seeing trips, theater parties, and interesting athletic events not only for the members, but also for the wives and lady friends attending.

A board of directors is the governing body of the association. It meets occasionally at the call of the president, and its activities are communicated to each member by the Secretary-Treasurer through bulletins announcing the proceedings of the board. The officers, which also constitute the Board of Directors, are as follows: H. H. Livingston, Salinas, President; Frank J. Duncan, Merced, Past President; Charles Goff, San Francisco 1st Vice President; J. A. McCaleb, Los Angeles 2d Vice President; Miner Carter, Red Bluff, 3d Vice President; Otto Langer, San Diego, 4th Vice President; H. D. Cloughley, Sacramento, Director; John Sansone, San Jose, Secretary-Treasurer; and C. J. Boone, San Bernardino, Sergeant-at-Arms.

THE DESERT HIGHWAY

Conceived in the brain of man,
 Constructed by man's toil,
 Stretching across the desert waste,
 A carpet of rock and oil,
 Not a magic flying square,
 Renowned in the fable of old,
 But a satin ribbon of rock and oil,
 By the hand of man unrolled.
 Fable has turned to truth;
 The rock with the oil smooth-bound;
 What need to fly through the air,
 When the "ribbon" is on the ground?

—Jos. E. Rich.

These pocket-handkerchief golf courses are bringing the game within reasonable bounds. We expect to hear any day of a player who has made eighteen holes in one.—*Boston Transcript*.

Sandy, who owned a theatre in Dundee, went to London to get some ideas for advertising.

While walking through the great city, he saw a notice outside a movie to the effect that all persons over 80 years of age would be admitted free.

"Just the thing," he told himself.

The following day Sandy returned to his native town and the first thing he did was to put a notice outside his own theatre which read:

"All persons over 80 years of age will be admitted free, if accompanied by their parents."—*Answers*.

THE KINGS RIVER HIGHWAY

(Continued from page 9.)

About seven miles from General Grant Park, the constructed road ceases and merges into preliminary work such as clearing, drilling, blasting and removal of material already blasted. Ahead of these activities the engineers are busily engaged in setting stakes to guide the construction forces. Further in advance is the location party of engineers occupied in collecting survey data for the location of the road. The work of this party would not attract anyone who is averse to strenuous physical effort as it consists of a hard hike in the morning from camp to the work over a makeshift trail or no trail at all—after climbing up steep hillsides—working along country steep and rocky or covered with thick brush, climbing up and down cliffs where ropes must be used for life lines and a return to camp which may be a hike of 30 minutes to two hours. A misstep in this country may easily result in a fatal fall. Rattlesnakes are encountered quite frequently.

Continuing along the west slopes of Indian Creek drainage the road will descend with good alignment to Ten Mile Creek and follow the latter creek to the junction of the Middle and South Forks of the Kings River, where it will turn easterly along the South Fork. After crossing Redwood Creek the location of the new road follows the south side of the river and approaches Horseshoe Bend. Here the river makes an "S" turn between almost vertical rock walls more than a thousand feet in height. Just what type of engineering expedient will be used at this point has not been decided, but the gorge should not fail to thrill the most jaded traveler.

Other points of interest will be seen, before the canyon proper is reached, one of the most interesting being Boyden's Caves. These are situated in a huge limestone cliff and are very spectacular. Before reaching the main canyon the road will descend to practically water level and enter the canyon. The canyon is a narrow valley with huge side walls replete with magnificent panoramas rivaling the world's most famous scenery. Recreational areas now accessible by trail only will be brought within the possibilities of week-end trips.

The road when finished to Copper Creek, in the canyon, will be approximately 38 miles in length.

VIRGINIA—A landscape engineer has been added to the staff of the department of highways.

Road Engineers From All Parts of World Meet at Washington

The United States, with its 600,000 miles of improved highways, is to serve as a "giant laboratory" for highway engineers and executives from all parts of the world.

The congress, first to be held in the Western Hemisphere, opened on October 6 in Washington, and will be followed by tours of delegates to various portions of the country for the inspection of highway and other conditions.

The purpose of the conference was recently outlined by Roy D. Chapin, president of the America Organizing Committee for the Sixth International Road Congress. He is quoted in the United States Daily as follows:

Fundamentally, these highway engineers are the vanguard of modern life. Upon the success of their efforts rests the opportunity of hundreds of millions of people to obtain for themselves new standards of living, new insight into the customs of their neighbors, new markets for the commodities they may produce.

As their work progresses, they will give new stability to government, new employment to vast hosts, new areas for you and me to explore with our families.

This matter of highway building is a very practical business. It requires inventive genius, thoughtful planning, sane administration, economic adjustments, financial arrangements, hard labor, and a certain schooling in the art of diplomacy. Only by a careful mixing of these ingredients does the taxpayer receive for his dollar, or its equivalent, the widest, longest and the best stretch of usable road.

CHANGES IN TWENTY-FIVE YEARS

Perhaps the simplest way in which to visualize the importance of this conference is to think back 15 or 25 years ago.

How far could you travel then over an improved road in the United States?

How long did it take you to go to nearby towns or farms over the highways?

How many of your friends had automobiles?

How many long trips had you taken?

The answer expressed statistically is that 25 years ago there were less than 25,000 automobiles. Now there are over 26,000,000 motor vehicles. Then only 155,000 miles of improved road existed in all the United States.

Of that road but 144 miles had a high type surface.

Today there are more than 600,000 miles of improved highway and another 500,000 miles of usable dirt road.

Where we were then spending less than \$100,000,000 a year in our highway improvement, today we are spending more than \$1,500,000,000 annually. Our people want more roads than are being built.

Now you can travel from any county seat in the United States to any other over an improved road, and there is no community isolated.

No longer are our rural folk cut off from the cities and if we still have far to go, the sheer wealth made possible by this new form of transportation, we have provided ourselves with ample means to carry on without hardship to the individual.

Vast areas of the world outside of the United States and part of Europe are today in precisely the situation which faced our fiscal authorities and our highway engineers years ago.

EFFECT ON WORLD RELATIONS

The effect upon world relations can best be depicted by a few examples.

Ten of the leading engineers of China are attending the congress. They come to find ways and means of extending the 34,000 miles of road which China has today into the inland provinces as a first essential step in the campaign to prevent the starvation annually of millions of people subject to famine because of lack of transportation.

From our neighbors in the Latin Americas we have as guests leading highway administrators whose task it is to provide ways and means of traversing the pampas, piercing the jungles or crossing the high mountains of the Andes.

Already the countries of South and Central America are making great headway. Buses now run through the passes of the Andes between the Argentine and Chile. Uruguay has many miles of modern road.

A triweekly postal service links together the coastal towns of Peru formerly cut from all but an intermittent steamship service with no communication with one another.

Brazil is pushing its roads south to Uruguay and west to Bolivia.

Venezuela is actively at work on main highways, while the new president of Colombia is intent upon securing loans for main roads to open up vast resources of his country.

Chile has a fine program under way. Chilean engineers have been touring our western states as guests of their highway departments for the past week, studying roads there where mountain conditions are similar.

Ecuador, Bolivia and Paraguay are all deeply interested in opening up their storerooms of natural resources through roads.

In Central America an inter-American commission is already formed to study a road from Panama to the United States which will permit a free flow of traffic from north to south. Panama, Guatemala and Salvador all have their links well under way.

Our great neighbor to the south, Mexico, is vying with our friends in Canada in the development of main and lateral roads and travel to Mexico City over the highway is now an accomplished fact.

Japan, Indo-China, India, Nigeria, Libia, Algeria, Morocco, these are but a few of the nations or colonies of the world, which will have engineers in attendance at the Road Congress.

Australia is sending men from New South Wales, Queensland and Victoria. New Zealand and New Caledonia alike will be represented.

(Continued on page 28.)

Sacramento and
San Joaquin
Water Resources
Study

Activities Among
Irrigation Dis-
tricts by State

September Activities

In the

Division of Water Resources

EDWARD HYATT, Chief of Division

State Approval
of 700 Dams
Requested

Applications and
Permits Filed For
Water Appro-
priations

WATER RESOURCES INVESTIGATIONS

SACRAMENTO VALLEY INVESTIGATION

An office report on the relation of the seasonal return water to seasonal diversion and the monthly distribution of the return water, was completed during the period and sent to the members of the Engineering Advisory Committee.

Flood concentration studies were completed for the Sacramento Valley at the latitude of Sacramento for the Feather River Basin. Flood frequency curves have been developed for the major streams of the basin. Surveys were made for dam sites on the Sacramento River in the vicinity of Table Mountain. These sites are about fifteen miles above Red Bluff. Studies have been continued to determine the most desirable method of operating the Trinity River diversion in connection with the storage reservoirs on the upper Sacramento River. Studies have been made to determine the economic installed capacities for power plants at the major reservoir sites in the basin.

Exploration work at the Kennett dam site was completed by the U. S. Engineering Department during the period. Three tunnels were driven with an aggregate length of 1450 feet. Additional exploration work was done at the Iron Canyon dam site. The exploration tunnel was extended 10 feet and another one at second test pit was dug to a depth of about 20 feet. Exploration work is under way in cooperation with the U. S. Bureau of Reclamation at the Table Mountain dam site.

Dr. David Weeks of the College of Agriculture, University of California, has submitted a preliminary draft of his report on the rate of development of agricultural lands in California. This report will be reviewed by a special committee appointed by Dean Hutchinson and will be transmitted by him to the State Engineer.

Sampling and testing of water at various stations on the American River have been continued throughout the period.

SAN JOAQUIN VALLEY INVESTIGATION

Studies of the irrigation yield to obtain with storage regulation were made during the period covering the following streams and reservoir sites:

- San Joaquin River at Friant reservoir site.
- Fresno River at Windy Gap reservoir site.
- Chowchilla River at Buchanan reservoir site.
- Merced River at Exchequer site.
- Tuolumne River at Don Pedro site.
- Stanislaus River at Melones site.

Seven million acres of foothill land from the Cosumnes River south to Merced County bordering the San Joaquin Valley have been examined. Of this total area a gross area of 1,400,000 acres has been classified as agricultural. This work has proceeded as far south as Merced County and is being continued into Mariposa and Madera counties. A map has been prepared showing the extent of the agricultural land in the San Joaquin Basin and the area now under irrigation development. These areas are being used in connection with the ground water investigation. The inter-seasonal water table fluctuations has been calculated and compiled for the entire period of record for the Upper San Joaquin Valley. Maps of this area delineating lines of equal depth to ground water as of October, 1929, are about three-fourths completed. Additional study of ground water storage capacity and the feasibility of replenishing same was made, taking into account the location of certain areas of nonabsorptive soils as revealed by field investigation and geological examination.

A revised study has been completed of month by month supply and draft for the stream basins of the Upper San Joaquin Valley, showing the total demand for water, the utilization of the local supplies, the requirement for imported water and net accumulation effect upon the ground water storage conditions for the 40-year period, 1889-1929, assuming complete irrigation development in that region.

Professor Frank Adams has submitted a preliminary draft on the "Permissible Cost of Irrigation Water in Southern San Joaquin Valley." This report was reviewed by representatives of the San Joaquin Valley Committee and others at a conference held in Visalia, September 20th. It is being reviewed at the present time by the College of Agriculture Committee. Upon its approval, the report will be transmitted by Dean Hutchison to the State Engineer.

A report on the power phases of the coordinated plan of water development of the Sacramento and San Joaquin valleys with special reference to pumping water up the San Joaquin Valley has been completed by Mr. Lester S. Ready, Consulting Engineer, San Francisco. The following subjects are covered in the report:

1. Growth of power market.
2. Ability to absorb output of the various units of the coordinated plan.
3. Value of power from power plants to be built in connection with water storage development.
 - (a) Cost of power from other hydroelectric plants.
 - (b) Wholesale price of power as indicated by existing contracts.
 - (c) Cost of power from steam electric plants.
4. Power required for pumping water up San Joaquin River.
5. Cost of power for pumping purposes.

WATER RESOURCES

SALT WATER BARRIER INVESTIGATION

Work on the salt water barrier investigation during the past month has largely been concentrated on the gathering and compilation of basic data required for the computation and determination of water supply, storage and consumptive demand from the proposed barrier lake. This work has included completion of field surveys of the Suisun and San Pablo Bay marsh areas to determine the classification as to crops, natural vegetation and culture and the nature and extent of present development, and the office compilation of the results of these surveys. The consumption of water by industries in the upper Bay region was completely compiled from the detailed information already obtained with the questionnaires used in the industrial survey. Other water demands required by the operation of the barrier and detailed data on water supply and storage volumes were compiled. The rates of consumptive use of water by crops and natural vegetation and evaporation were determined for all of the consumptive areas in the delta and marsh areas of Suisun and San Pablo bays. This was included in a special study and report rendered by Charles H. Lee, consulting engineer, of San Francisco, with regard to evaporation and transpiration losses from natural vegetation and the final compilation by the U. S. Department of Agriculture of the results of six years of intensive measurements of duty of water in the delta of the Sacramento and San Joaquin rivers. Computations were completed on this study for each of the three barrier sites; namely, Chipps Island, Dillon Point and San Pablo Point. The deficiency in supply over the demand for each month and year for the present consumptive demands and the supplementary water required to meet these deficiencies were computed for each of these sites, assuming water supply available as during the past ten years.

Rapid progress has been made during the past month in the studies being carried on by the Industrial Economics Committee of the relation of the proposed salt water barrier to industrial development in the upper San Francisco Bay area. The committee, consisting of Professor W. E. Hotchkiss, Dean of the Stanford Graduate School of Business as chairman; Professor H. S. Grady, Dean of the Graduate School of Business of the University of California, and Mr. A. D. Schindler, consulting engineer, of San Francisco, have met twice during the past month, considering in detail the results of special studies being conducted by Professor George W. Dowrie, consulting economist from the Stanford Graduate School of Business. In this connection the office staff has completed detailed analyses of the consumption and cost of water used by the present industries in the upper Bay area.

Special reports on geology of the region in which the proposed salt water barrier sites are located, by Professor Tolman, consulting Geologist of Stanford University, and the studies of sewage pollution and industrial waste in relation to redemption of water supplies from the proposed salt water barrier lake, by Mr. C. G. Gillespie, sanitary engineer of the State Board of Health, are nearing completion and it is expected that the reports will be available next month.

SALINITY INVESTIGATION

Office work on salinity investigations during the past month has been concentrated on the preparation of plates and data for the salinity report and the final

computations on the relation of the advance and retreat of salinity to stream flow and tidal action, leading to the determination of supplemental stream flow required for control of salinity. The studies on the variation of salinity as related to stream flow and tidal action have included determination of the consumptive use of water in the delta of the Sacramento and San Joaquin rivers by crops, natural vegetation and evaporation. This work was practically completed, involving the determination of the relation of the advance of salinity for various degrees of salinity and at various points in the delta channels to the net effective stream flow. From these relations the control flows required for preventing the advance of salinity will be determined. Work on the preparation of the plates for illustrating the report about 85 per cent completed by the end of the month.

Field work has continued on the maintenance of between 30 and 40 regular salinity observation stations over the entire tidal basin from San Pablo Bay to the upper reaches of the delta, and, in addition, automatic tide gage stations throughout the tidal basin.

SOUTH COASTAL BASIN INVESTIGATION

Work of determining the capacity of underground basins was begun and arrangements were made for putting on a larger force for this work. A meeting was called by the Los Angeles County Conservation Association in Los Angeles on September 10th with a view to promoting the formation of a committee of laymen for cooperation with this office in the investigation.

MOJAVE RIVER INVESTIGATION

Routine work proceeded during the month. Plans were made for determining the evapo-transpiration losses in the various basins of the Mojave River. It appears that this information will be necessary before an intelligent report can be made. This work will be handled by the U. S. Geological Survey and the U. S. Department of Agriculture, Division of Agricultural Engineering.

VENTURA COUNTY INVESTIGATION

Aside from the ordinary routine procedure of the investigation, work was begun on a special investigation of a reservoir site on Piru Creek. A relocation of the State highway to take the place of the Ridge Route is projected down this creek and passes through the reservoir site. The object of the special investigation is to determine whether this is the best reservoir site on the creek and whether it is necessary to conservation of the water of the creek. A report will be made to the Director at an early date.

SANTA CLARA VALLEY AND NAPA COUNTY INVESTIGATIONS

Office work in connection with these two investigations is proceeding in anticipation of completing a progress report before the close of the year.

PIT RIVER (MODOC AND LASSEN COUNTIES)

Routine field work was continued throughout the month.

MISCELLANEOUS INVESTIGATIONS AND ACTIVITIES

A report was completed on the work done to date in the investigation of the extent of and use of water on lands riparian to the Sacramento and American rivers and the extent of lands overflowed by these streams.

A regular inspection was made of the work being conducted in the Sacramento-San Joaquin Delta and in the Santa Ana Basin under the Cooperative Agreement with the U. S. Department of Agriculture, Divi-

sion of Agricultural Engineering, covering irrigation investigations.

HOOVER-YOUNG COMMISSION, LEGISLATIVE WATER COMMITTEE

The eighth meeting of the Joint Legislative Water Committee and the Hoover-Young Commission convened at Hotel Oakland, Oakland, on September 12 and 13, with all members of both bodies present.

Business was resumed after two months devoted to technical studies without formal hearings. The business transacted by both bodies to date was reviewed and rechecked.

Report of Mr. H. F. Ormsby was received and read covering transactions of the eleven Western States conference held at Salt Lake City during the month of June.

Lieutenant Colonel Robins, District Engineer, U. S. Engineers, reported on progress of the investigations under his direction.

Mr. E. W. Kramer, District Engineer, U. S. Department of Forestry, gave a verbal report on results of investigation of power rates, consumption and development.

Mr. C. A. Bissell, District Engineer, U. S. Reclamation Service, reported on the progress made in the investigation under his direction.

During the hearing State Engineer Edward Hyatt submitted technical data in connection with investigations of the state-wide plan and reviewed the activities of Division of Water Resources and its engineering advisory committees.

IRRIGATION, WATER STORAGE DISTRICTS AND BOND COMMISSION

Field work in connection with the assembling of data for the extension of Bulletin No. 21 has been completed, as also has the collection of data on the cost of water in California irrigation districts.

Office conferences have been held with representatives of the El Nido, Linden, El Dorado, Madera and Medano irrigation districts regarding the progress of these districts. A conference has also been held with proponents of the West Joaquin Irrigation District, an area of about 200,000 acres lying on the west side of the San Joaquin River and extending south from Crows Landing to Mendota. This area petitioned for organization in 1921 but failed to carry its organization plans to completion.

A petition was filed with the State Engineer requesting the exclusion of 319.2 acres of land from the Tulare Lake Basin Water Storage District, located in Kings County. Hearing on this petition has been set for October 14, 1930.

The California Bond Certification Commission has approved of the Linden Irrigation District proceeding with an election for a bond issue for the development of the district in amount of \$105,000. The California Bond Certification Commission has approved a rescission order on old work for the Woodbridge Irrigation District in amount of \$878 and authorized the district to expend this amount for new work which has recently been approved. The agreement between the Potter Valley Irrigation District and the Snow Mountain Water and Power Company covering the delivery of water to the district has been approved by the California Bond Certification Commission.

The horse took longer to get you there, but you didn't have to drive half-way back to hitch.—*Publishers Syndicate.*

DAMS

The activities of the Division have, during this period, been directed to completing a preliminary inspection of all dams now known to be under state jurisdiction, a study of the design of existing dams, a geological inspection of existing dams where deemed necessary, and constant supervision of dams under construction.

To date 700 applications have been filed for approval of existing dams; 46 applications for approval of plans for the construction or enlargement of dams, and 42 applications for approval of plans for repair or alteration of dams.

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

Dam	County	Owner	Estimated cost
Kramer*	Lassen	G. L. Kramer	\$2,000
Alta San Rafael*	Los Angeles	Alta San Rafael Company	13,600
La Grange**	Stanislaus	Turlock and Modesto Irrigation District	7,500
Porter**	Modoc	Pearl F. Porter	750
Whittier Reservoir No. 4	Los Angeles	City of Whittier	65,000

*Construction.
**Enlargement.

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

Sixteen such applications have been received during this period. The greatest number coming from Modoc County in response to the recommendations of our resident engineer in that locality.

PLANS APPROVED FOR CONSTRUCTION

Dam	Owner	County
Lake Madrone	Geo. W. Mansfield & Duncan C. McCallum	Butte
Dam Swanzey	Calif. & Hawaiian Sugar Refining Co.	Solano

PLANS APPROVED FOR REPAIRS OR ALTERATIONS

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

Order authorizing use of reservoir pending formal approval of the dam was issued to the city and county of San Francisco for the Moccasin Dam in Tuolumne County.

An office has been established in the Associated Realty Building in Los Angeles to take care of the eleven southern counties. The engineer in charge of this office, with the aid of an assistant, will supervise the construction of new dams. This will bring the department in closer contact with the southern part of the state and expedite decisions on various questions which arise on all construction jobs. They will also make an intensive study of all existing dams in that section with a view to issuance of certificates of approval at an early date.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Regular field and office work comprising measurements of all diversions, stream flow, and return flow throughout the Sacramento-San Joaquin territory, has continued. Office work has included the preparation of mailing lists and mailing out of Bulletin No. 23 and the 1929 Annual Report and the preparation of maps of the irrigated areas under the diversions recorded.

In the field the engineers have begun the regular annual census of irrigated crops and areas and will be occupied on this for the major portion of the time up to November 1st.

The salinity investigation has been continued with the maintenance of six regular tide gage stations and sampling at 46 stations in the bay and delta area. The three tide gages which were installed temporarily in the vicinity of Courtland to secure data in connection with the proposed diversion of Sacramento River water through Snodgrass Slough have been discontinued as the desired data have been secured.

The following are comparative data for 1929 and 1930:

Salinity in parts of chlorine per 100,000

Station	Sept. 2, 1930	Sept. 2, 1929
Bullhead Point.....	1360	1340
O. & A. Ferry.....	800	720
Collinsville.....	570	680
Antioch.....	400	555
Jersey.....	160	365
Emmaton.....	146	255
Webb Pump.....	60	39
Rio Vista.....	20	67
Isleton.....	7	5

Discharge in second feet

Station	Sept. 2, 1930	Sept. 2, 1929
Sacramento River at Sacramento	3300	3200
San Joaquin River near Vernalis	1200	680
Combined Flow to Delta.....	4500	3880

SNOW SURVEYS

The last half of August was spent on office work in working up the data for Leevining and Rush Creek areas in the Mono Basin and Mammoth, Rock, Bishop, Big Pine and Cottonwood Creek areas in the Owens River Basin. The relation between snow survey and precipitation measurements and run-off for the few years that snow surveys have been made was determined and the actual run-off compared with what would have been the forecasts. This study indicated certain improvements in the work which might be made in the way of additional snow courses, etc., and in the first half of September, a field trip was made to go over the work with and suggest these improvements to the cooperating agencies, the Southern Sierras Power Company and city of Los Angeles. On the same trip the plans were perfected for the coming season's surveys in these two basins and in the Kings and Kern River Basins as well. The equipment used has been overhauled and is being redistributed.

WATER RIGHTS

APPLICATIONS TO APPROPRIATE

Twenty-eight applications to appropriate water were received during the month of August, 16 applications were canceled and 17 were approved; 4 licenses were issued.

Applications received during the month which were of more than ordinary interest are those from the city of Fresno seeking appropriations from the San Joaquin River for municipal water supply, irrigation, and power purposes at an estimated cost of \$1,000,000; and the application by R. D. Owen to appropriate from Arrowhead Lake, Mono County for power purposes, estimated cost \$50,000.

Among the permits issued was one to the Montague

Water Conservation District allowing an appropriation from Inconstance Creek, Siskiyou County for irrigation purposes, the estimated cost of the project being \$200,000.

ADJUDICATIONS

Shasta River (Siskiyou County): Case pending in the Superior Court of Siskiyou County.

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

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

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

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

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

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

Davis Creek (Modoc County): Negotiations relative to a consent judgment still being carried on.

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

Deep Creek (Modoc County): The field investigation of water supply and use of water was continued throughout the month.

Franklin Creek (Modoc County): The field investigation of water supply and use of water was continued throughout the month.

WATER DISTRIBUTION

Little Shasta River and Lower Shasta River (Siskiyou County), *Iat, Burney, North Cow, Oak Run and Clover creeks* (Shasta County), *Davis, Emerson, Mill, Owl and Soldier creeks* (Modoc County) and *West Fork of Carson River* (Alpine County). Water master service on these streams was continued throughout the month.

Pit River (Modoc and Lassen counties). Supervision over diversions from Pit River in Big Valley was continued throughout the month by the resident engineer on the Pit River investigation. The flow of the stream has receded to a point where only sufficient water is available for stock watering purposes.

FLOOD CONTROL AND RECLAMATION

MAINTENANCE OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT

The irrigation of willows planted for levee protection along the Sutter By-pass has been discontinued for the season. Routine maintenance work has been carried on and some clearing of second growth timber in the by-pass has been done. An average of twenty-five men have been engaged in this work during the period. The project in Sutter County is now in good order for the winter season.

FLOOD CONTROL PROJECT MAINTENANCE—BANK PROTECTION

The Ritchie contract for constructing pavement levee protection at Isleton was completed on August 28, 1930, at a total cost of \$7,250.

Two current retards have been completed on the Davis property on the Sacramento River eleven miles above Colusa, in cooperation with Reclamation District No. 2047, at a cost of \$6,200.

Three current retards have been completed on the Campbell and Dwyer ranch two miles below Colusa, and one current retard has been completed on the Cecil ranch four miles below Colusa, in cooperation with the Sacramento River West Side Levee District, at a total cost of \$10,600.

The bank protection repair work for Reclamation District No. 535 at Oak Hall Bend on the Sacramento River has been completed, with the placing of 300 tons of quarry rock.

Arrangements have been made to install two tree current retards on the left bank of the Sacramento River at Twenty-Mile Bend two miles below Meridian, in cooperation with Reclamation District No. 70 at a cost of \$4,100, work to start immediately. About 500 additional tons of quarry rock will be deposited on the Brannan Island protection, in cooperation with Reclamation District No. 2067. Work is being commenced at once on bank protection work on Twitchell Island, Andrus Island, and in the San Joaquin River at Tom Paine Slough.

SACRAMENTO FLOOD CONTROL PROJECT

An average of sixty-five men have been engaged during the period in clearing in the Sutter By-pass and two camps have been in operation. The clearing work in the Feather River bottoms near Marysville under five contracts is 95 per cent complete.

Surveys have been completed for the Bow levee at Nelson Bend, a unit of the flood control construction program, and the surveys of the areas cleared and to be cleared in the by-passes have continued. Considerable work has been done in connection with right of way matters relating to the new levees in the flood control construction program and in making arrangements for the work to proceed on the various construction units proposed.

The Deputy in Charge of Flood Control and Reclamation attended one meeting of the Reclamation Board and one meeting of the construction committee of the flood control association.

SANTA MARIA RIVER

A project for clearing the channel of the Santa Maria River of timber and brush near Guadalupe has been undertaken by this department in cooperation with Santa Barbara County for the purpose of rectifying the channel and providing a clear passage for flood waters.

The channel will be cleared for a length of six miles to a width of approximately 400 feet at a cost of \$6,000, of which the state will contribute \$2,000. It is expected that additional funds will be provided by other local interests to bring the total sum available up to at least \$10,000. The work will be done by day labor.

RUSSIAN RIVER JETTY

Eight men have been engaged in operating the railroad and quarry, depositing rock in the Russian River jetty. This work will continue for two months. The channel has remained open.

NAVARRO RIVER JETTY

It is expected that the rock jetty on the Navarro River, which is being constructed under contract by

Christie and Allen, will be completed by October 15, 1930. This work is being done for the Division of Fish and Game.

SEPTEMBER REPORT OF DIVISION OF MOTOR VEHICLES

FRANK SNOOK, Chief

STUDY IS MADE OF MOTOR VEHICLE ACCIDENTS

A research study on the hours of occurrence of motor vehicle accidents was made by the Bureau of Research, Statistics and Traffic Safety during the month. This study revealed that during the period of 3 p.m. and 9 p.m. daily, there is a continuing condition existing resulting in a maximum of accidents. The study brought out that from 68 per cent to 70 per cent of all motor vehicle accidents occur in or close to large municipalities.

Based on this study, an "ideal" traffic patrol schedule was worked out. This schedule differs from schedules now employed in many cities, although most large police departments approximate it. The study was submitted to the police chiefs of various cities for the purpose of informing them accurately upon the exact periods of peak traffic congestion. Many chiefs were surprised to learn the extent of the period and did not realize that maximum strength patrol should be continued up to as late as 9 p.m. This study was received with much appreciation and several chiefs have written their thanks to the Bureau. Dozens of highly complimentary letters have been received by the Bureau from persons in California and other states who have received the revised monthly statistical summary. These letters indicate that the Division has succeeded in presenting accident figures in a more simple and more readable form.

HIGHWAY PATROL ACTIVITIES

During the past month the Head of the Bureau of Traffic Enforcement has devoted his time chiefly to inspection work. During the month the officers and men in the Patrol drove 843,027 miles. During the State Fair a detail of 14 men were assigned to duties of directing traffic at the Fair Grounds.

Every county squad has increased their enforcement of light regulations during the past month. While August figures have not as yet been completed, we expect to show a considerable increase in the work over previous months. During August four new signals and six light devices were submitted to the Bureau for tests.

The Bureau of Brakes and Commercial Vehicles have continued their program of inspection and have received new equipment for the transportation of the equipment used in making brake tests which will make it possible to increase the number of brakes tested in all districts of the state.

So far this year 1549 applications have been received for official brake testing stations, of which 1077 have been approved. There are at present 2410 authorized adjusters. During the month 2010 trucks were tested, 1095 warned and 498 drivers of trucks were arrested.

OPERATORS' LICENSES

During the past month 32,753 operators' licenses were issued by the Division. This number is approximately 10 per cent less than in July.

COMPARATIVE FIGURES

The following comparative figures are as of September 1, 1930, as compared with September 1, 1929.

	1930	Increase or decrease as compared with 1929
Motor vehicle registrations	2,033,166	93,620 Increase
Automobile, truck and trailer dealers registrations	3,184	136 Decrease
Transfers	376,900	64,956 Decrease
Chauffeur's licenses	135,062	5,517 Increase
*Nonresident permits	56,886	5,969 Increase

*Figures cover first seven months of 1930 and 1929.

SEPTEMBER REPORT OF DIVISION OF ARCHITECTURE

GEO. McDOUGALL, Chief

During September, contracts were awarded upon projects at the San Diego State Teachers College and the Preston School of Industry. These projects show a value of \$67,441.

ROAD ENGINEERS FROM ALL PARTS OF WORLD MEET AT WASHINGTON

(Continued from page 22.)

As we turn to Continental Europe, every country has its engineers here. Great Britain has close to 100 of its leading highway administrators and men interested in highway transport as its representatives; France has some 50 men, Italy 30, Germany an equal number.

Czechoslovakia, Bulgaria, Greece, Belgium, The Netherlands and the Scandinavian countries with Poland and Yugoslavia are here with picked representatives, and so the list goes.

From them, we will hear the story of trails flung across the Arctic Circle, of roads built in the time of the Roman Empire, and through the days of Napoleon, now brought back into new service for modern-day traffic.

With them, we will discuss the problem of providing roads for new countries, of ways and means of finance, of accelerating the constantly increasing highway traffic in the congested areas of the great cities, whether it be London or Paris, Berlin, Brussels, Madrid, Shanghai, Tokio, Bagdad or Bombay.

The essential task of fitting highway transport into the jig-saw puzzle of other forms of transportation, rail, water and air, so as to establish a uniform, continuous and economic whole, will receive its due share of attention from the delegates.

UNIVERSAL SIGNALS PLANNED

With them we will discuss the development of common rules of the road, in order that the man who drives an automobile, whether he be in Palestine or Siberia, Malaya or Detroit, whether he speaks Japanese or Arabic, Italian or any other tongue, may know that the signs and signals mean the same thing so that he may proceed with safety. The aim is universal traffic signals, intelligible to all the world.

In this conference, we may speak a variety of tongues, but we have a great universal language—the language of the road.

Cliff Dwellers Are Found on Route of Proposed Highway

Two modern cliff dwellers, legal residents of Ventura County, were discovered inhabiting a hollow rock in a secluded settlement in the Santa Susana mountain section by the county officials while inspecting the route of a proposed highway in the Simi Valley.

High and dry in their rocky abode, the man and woman, who remain unidentified, have laid a cement floor, built a protecting wall over the large hole in the hard sandstone formation, and made two rooms of the enclosure by erecting a partition in the middle.

The wife, young and good looking, keeps "house," while her husband works as a garage mechanic near by at Chatsworth.

One of the rooms, into which the only door leads, is a combination kitchen and living room. The other is the bedroom. A stove-pipe leads from the stove to the point where the wooden partition joins the rock at the top, and follows along up the face of the gigantic rock.

LAUGH

Build for yourself a strong box,
Fashion each part with care;
Fit it with hasp and padlock,
Put all your troubles there.
Hide therein all your failures,
And each bitter cup you quaff,
Lock all your heartaches within it
Then sit on the lid and laugh.

Tell no one of its contents,
Never its secrets share;
Drop in your cares and worries,
Keep them forever there.
Hide them from sight so completely
The world will never dream half,
Fasten the top down securely
Then sit on the lid and laugh.—Exchange.

OREGON—Motorists in this state are protected in the use of drinking water by drinking fountains, artistically designed to conform with their surroundings, erected by the Oregon State Highway Commission, with signs announcing them 300 feet in each direction.

MEXICO—A new international highway to extend from Parrel, Chihuahua, Mexico, to Ensenada, Lower California, Mexico, and connecting at Parrel with a highway to Juarez, Mexico, opposite El Paso, has been announced by the Mexican Government. Work is already in progress on the first 60-mile unit south from Juarez.

Progress on State Highway System

MAJOR PROJECTS COMPLETED, UNDER WAY AND ADVERTISED AS REPORTED
TO GOVERNOR'S COUNCIL ON SEPTEMBER 24th

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

PROJECTS COMPLETED

Contracts completed from August 21st to September 24th include the following:

WORK IN IMPERIAL COUNTY

Two contracts for placing Portland cement concrete pavement, 20 feet wide, in the Imperial Valley have been accepted.

One was on a portion of the interstate highway which extends between Yuma, Arizona, and San Diego and Los Angeles. The work was done over that part of the road from El Centro to Holtville, a distance of 9 miles, and included the construction of wide side ditches and raising the grade of the highway to eliminate flooding of the road from irrigation overflow.

The other contract was on the main highway between El Centro and Los Angeles via San Bernardino. The 10.4 miles between Brawley and 4 miles west of Westmorland were included in the improvement. This project completes the concrete pavement between El Centro and San Bernardino making a more adequate roadway for the heavy produce trucking which this artery between the fertile Imperial Valley and metropolitan Los Angeles is called upon to carry.

These two improvements in Imperial County were completed at a cost of \$647,200.

FOOTHILL BOULEVARD

An important improvement on the Foothill Boulevard between Los Angeles and San Bernardino is completed by the widening of the reinforced concrete girder bridge across the San Gabriel River near Azusa. This 1000-foot structure was widened to a clear roadway width of 42 feet, thereby relieving the "bottleneck" which had been formed at this point by the widening to 40 feet of the pavement on both sides of the old narrow bridge. The cost of this widening amounted to \$92,500.

CREST DRIVE

Nearly two miles of the scenic Crest Drive in the mountains just to the north of San Bernardino have just been graded on a new alignment at a cost of \$111,500. This portion extends from the pass, between Waterman Canyon and Devils Canyon, down Waterman Canyon. Bids were opened this month for oiling both this section and that section from Running Springs to Squirrel Inn of this popular recreational highway. The grading just completed has brought to modern standards of mountain highway construction the worst section of the road from San Bernardino to Big Bear Lake.

WORK AT BEACHES

In Orange County, the Portland cement concrete pavement on the heavily traveled Coast Boulevard has been widened from 20 feet to 30 feet between Sunset Beach and Newport Beach, and the roadbed widened to the full width of the right of way. The unusually wide roadbed is designed to give much needed parking space for the traffic using this road through the southern California beaches. A similar project is just starting between Seal Beach and Sunset Beach, and also construction on a new alignment of that portion of the route from Long Beach to Seal Beach. The improvement just completed cost \$215,800.

VENTURA BOULEVARD

On Ventura Boulevard in Los Angeles County, the old Liberty Grade has been straightened and given a much easier grade. This roadbed and pavement relocation and construction is located about five miles north of Calabasas on the Los Angeles to San Francisco Coast Route. The cost was \$78,400 and covered a distance of 1.2 miles.

MOJAVE HIGHWAY PROJECT

The steady improvement of the Mojave to Bishop Highway is noted by the completion of the 3.7 miles in Inyo County between Little Lake and Coso Junction. Costing \$88,200, this road has been graded to the standard 36-foot roadbed and surfaced with 20 feet of oil treated rock on crusher run base. This section of desert road through the Owens Valley is closely paralleled by the Owenyo branch of the Southern Pacific and the Los Angeles Aqueduct. In order to build the highway at Little Lake, it was necessary for the state to relocate and construct the railroad's roadbed for a short distance.

COAST ROUTE BETTERMENTS

Nearly ten miles of the Coast Route between Los Angeles and San Francisco have been reconstructed from Atascadero to Paso Robles. The work, costing \$296,200, consisted of straightening, leveling and widening the old road. A standard 20-foot asphalt concrete pavement with 8-foot shoulders has replaced the old 15-foot Portland cement concrete pavement, bringing another stretch of this important arterial to the standards of a modern high-speed highway.

Costing \$244,800, one of the largest bridges on the Coast Route has just been erected across the Salinas River at San Ardo in Monterey County. The old bridge, which was only 15 feet wide, was built by the county in 1907 and had become dangerous for the loads and traffic it was called upon to carry. The new structure consists of ten 100-foot steel deck truss spans and seventeen 37-foot reinforced concrete girder spans.

REDWOOD HIGHWAY WORK

The progress of the construction of the Redwood Highway on the new alignment from Sausalito to San Rafael in Marin County is noted by the completion of the overhead crossing across the tracks of the Northwestern Pacific Railroad at California Park, just to the south of San Rafael. This structure consists of one 150-foot steel truss span on concrete piers, one 41-foot and one 28-foot steel beam spans on structural steel bents and 686 feet of timber trestle on pile and frame bents, providing a clear roadway width of 44 feet, 8 inches. The grading on the section of this new routing of the popular Redwood Highway from Alto to San Rafael was completed some two months ago and the surfacing is now being placed so that by the time of the completion of the grade separation and bridge now under construction, this section will be ready for use by the public.

MOTHER LODE PROJECTS

The improvement of the Mother Lode Highway, which extends through the heart of the mining district of California's early history, is always a matter of widespread interest. The section of this all-year mountain road in Calaveras County for a mile and a half north and south of Calaveritas Creek has just been graded and surfaced with oil treated crushed rock, and a reinforced concrete girder bridge 240 feet long has been built across Calaveritas Creek. This portion of the old, narrow and crooked road with its many sharp breaks in grade has been replaced by a modern mountain highway with large radius curves and easy grades. The road construction and bridge cost \$71,100.

VICTORY HIGHWAY

In Placer and Nevada counties, the grading of the new alignment of the Sacramento to Reno highway over the 10.5 miles from Indian Springs to Soda Springs has just been completed. The placing of untreated crushed rock surfacing over this and the adjoining section from Emigrant Gap to Yuba Pass is now under way. This improvement, the grading portion of which cost \$303,000, will be greatly appreciated by the thousands of tourists using this route to Lake Tahoe and other mountain resorts.

PACIFIC HIGHWAY

A small improvement, but one of importance in closing a gap in the pavement, has been completed through Wheatland in Yuba County. This work was a realignment of a portion of the Pacific Highway between Sacramento and the Oregon line. The new alignment has, by diagonal routing, eliminated the right angle turns in approaching and passing through the town. A standard 20-foot Portland cement concrete pavement on a 36-foot roadbed was constructed at a cost of \$37,300. A similar project on this route is now under way at Lincoln in Placer County which will complete the pavement between Sacramento and Red Bluff.

CONSTRUCTION BIDS

Bids on construction opened during the same period include the following:

CASTAIC BRIDGE

In Los Angeles County, a reinforced concrete girder bridge, composed of seven 35-foot spans on concrete pile bents and concrete abutments with pile foundations and having a roadway width of 34 feet, is to be

built across Castaic Creek on the Los Angeles-Sacramento artery south of the Ridge Route. This new structure will be built on a new alignment at this crossing of Castaic Creek and will replace the existing 8-span through girder bridge which was built by the county some 15 years ago on an inferior line. Bids for construction of the approaches were opened on October 1, 1930.

BAY SHORE HIGHWAY

Rapid construction of the Bay Shore Highway is evidenced by the succession of projects which have been started under way in the past few months. Bids were opened on September 3d for the construction of a 60-foot graded roadbed over the four miles from Redwood City to Willow Road in San Mateo County. This will mark another stride in carrying this important alternate route down the peninsula from San Francisco to San Jose. The termination of this project is Willow Road, which is the main connection between the Coast Route and the Dumbarton Bridge across the lower arm of the bay. In conjunction with the construction of this portion of this route will be the building of a subway under the tracks of the Southern Pacific Railroad's Dumbarton cutoff. This structure, however, will be built under a separate contract.

Two more projects on this route have also been advertised during the past four weeks. One calls for the paving with Portland cement concrete 40 feet wide from the northerly city limits of South San Francisco to the underpass under the Southern Pacific's main line tracks in South San Francisco, and the other will be the placing of a bituminous treated surface 42 feet wide on the recently constructed graded roadbed between San Mateo and Redwood City. This last project will give a graded and surfaced highway over the 20 miles from San Bruno avenue in San Francisco to Redwood City.

The total cost of these three projects will be approximately \$390,000.

MOTHER LODE BIDS

The further improvement of the Mother Lode Highway is noted by the opening of bids for the construction of the 4.3 miles from Amador City to Martell in Amador County. This improvement will connect with the recently constructed section from Drytown to Amador City and will pass through the interesting old mining town of Sutter Creek. The roadbed will be 24 feet wide and will be surfaced with 20 feet of untreated crushed gravel or stone. This rapid development of the Mother Lode Highway is opening to the tourist an all-year mountain road through a country rich in relics of early California history.

County Reports on State Highway Projects

COLUSA COUNTY

Grading of 13 miles of new state highway, between Bear Creek and five miles west of Williams, on the Ukiah-Tahoe Highway under contract by R. G. Le Tournau, is progressing very satisfactorily. E. L. Evans is resident engineer in charge of the work, which is about 35 per cent complete.

Grading of 39-foot roadbed between Williams and Maxwell, under contract by Fredrickson-Watson Con-

struction Co., is progressing favorably. C. F. Woodin is resident engineer in charge of the work, which is about 82 per cent complete.

Proposals will be received September 24 for constructing a gravel subbase for ultimate Portland cement concrete between the above limits.

Proposals will be received October 1 for construction of property fence between Bear Creek and 8 miles west of Williams.

EL DORADO COUNTY

Construction of a new roadbed between Bay View Rest and one mile north of Eagle Falls is under contract by Nate Lovelace. The mountainous country through which the route is projected necessitates a large volume of roadbed retaining wall. The wall is being constructed of selected material obtained along the work. W. G. Tinney is resident engineer in charge of the work, which is about 82 per cent complete. It is expected that the contract will be finished this year.

A contract for applying 6.2 miles of bituminous surface treatment between Fresh Pond and 2 miles east of Riverton was awarded to F. C. Adams of Angels Camp on August 13, 1930. The contractor is assembling a rock crushing plant at a local gravel pit, and expects to begin applying the treatment in a few days. J. G. Meyers has been appointed resident engineer.

Proposals were received September 24 for grading and surfacing 1.7 miles between Clark's Corner and Placerville. The work includes the construction of a reinforced concrete bridge across Hangtown Creek. The new construction will be over new right of way, using latest standard grade and alignment.

GLENN COUNTY

The concrete paving project between Logandale and Willows, under contract by Basich Bros. Construction Co., was begun the latter part of May. The pavement has been completed and very good performance for this type of work was obtained. The contractor laid 11,465 cubic yards of concrete in 28 days. The average daily output was about 417 cubic yards. The maximum amount placed a day was 450 cubic yards.

Very good test reports from the laboratory have been received and the finished surface is up to the standard for smoothness. E. J. L. Peterson is resident engineer in charge of the work, which is about 92 per cent complete.

LAKE COUNTY

From Abbott Mine to Bear Creek, Colusa County, the construction of a new 24-foot graded roadbed is one-third finished. Work is on schedule, and, at the present rate of progress, will be completed by the early part of next year. E. L. Evans is resident engineer in charge of the work.

MONTEREY COUNTY

The bridge across the Salinas River at San Ardo is complete. Ben C. Gerwick was the Contractor under the supervision of the Bridge Department.

Progress is being made on the bridge across the Salinas River at Bradley. H. E. Doering is the Contractor under the supervision of the Bridge Department.

The timber bridge across Alder Creek on the San Simeon-Carmel Highway has been completed. The Dean Construction Co. was the Contractor under the supervision of the Bridge Department.

Two convict camps are maintained on the San Simeon-Carmel Highway. Camp No. 22 at Willow Creek has a crew of eighty men, and Camp No. 18 at Little Sur has a crew of sixty men.

The new camp at Willow Creek is being beautified by convicts in their spare time, and is already one of the most attractive camps in the state. Free men's

quarters have been provided at Spruce Creek about three miles south of Willow Creek. Surveys and plans are in progress for extending the work of both camps.

PLACER COUNTY

Contractor N. M. Ball began grading and paving with Portland cement concrete through the town of Lincoln on August 13, 1930. A 35 to 50-foot grade, carrying a 20-foot pavement on improved alignment, will replace the present narrow 15-foot pavement. J. D. Greene is resident engineer and reports the work about 10 per cent complete. The anticipated date of completion is December 24, 1930.

A. Teichert and Son on September 10 completed the applying of a bituminous surface treatment between Roseville and Rocklin, under the supervision of Resident Engineer J. G. Meyers.

Construction began September 2, 1930, by the T. M. Morgan Paving Co. for the grading of a 36- and 48-foot roadbed and the driving of a highway tunnel that will eliminate from the highway system the present steep grade and crooked routing through the town Newcastle. Under this contract, the roadbed will be surfaced with oil treated crushed gravel or stone, and is designed to serve as a temporary traffic surface and as a base for the prepared Portland cement pavement that will be placed in the near future. James Trask has been appointed resident engineer. Work will be completed in May, 1931.

PLACER AND NEVADA COUNTIES

Grading of about 9½ miles of highway between Airport and Indian Springs, a part of the Dutch Flat-Donner Lake wagon road, by T. E. Connolly, is being completed as rapidly as possible to permit the placing of crushed stone surfacing, which will be placed by Tiesiau Bros. on the entire length of the new grade. R. A. Burns is resident engineer in charge of the work.

SAN BENITO COUNTY

Surveys are nearly complete for the elimination of the San Juan Grade between Salinas and the San Benito River. This line has been located in a position that will preserve the natural beauty of Pinecate Rocks, along the route. The project is located in San Benito and Monterey counties.

SAN LUIS OBISPO COUNTY

Work is complete on the reconstruction of the Coast Highway between the Santa Maria River and Los Berros Creek. This is a 20-foot Portland cement concrete pavement on a 36-foot roadbed. J. F. Knapp was the Contractor.

Bids were received on October 8th for the construction of a 20-foot concrete pavement across the bed of the Santa Maria River. This is a dry weather detour around the through steel truss bridge, one span of which collapsed on June 10, 1930. The wrecked span will be replaced by a temporary trestle to carry traffic during high water.

On the Coast Highway, between San Luis Obispo and Cuesta Grade, the road is being reconstructed with a 36-foot roadbed and a 20-foot Portland cement concrete pavement. The Cornwall Construction Company is Contractor.

On the Cholame lateral, between the Sacramento Ranch and the Kern County line, a seal coat is being applied to the existing bituminous macadam. Fred Nighbert is the Contractor.

Plans have been prepared for the reconstruction of the Coast Highway between Paso Robles and the

Monterey County line, a distance of about ten miles.

Surveys are in progress for the reconstruction of the portion of the Carmel-San Simeon Highway from San Simeon to Cambria.

SANTA BARBARA COUNTY

Progress is being made on a reinforced concrete bridge across Nojoqui Creek on the Coast Highway. This is located about 1½ miles south of Buellton. Silveria and Robbins are the contractors under the supervision of the Bridge Department.

On the Cuyama lateral from the second crossing of the Cuyama River to the Kern County line, a distance of about thirty-eight miles, the road is being surfaced with crusher run base and oiled rock surface, twenty feet in width. The Lang Transportation Company is Contractor. A portion of this project is located in San Luis Obispo County.

Work is complete on the reconstruction of the Coast Highway between Zaca and Wignmore. The Cornwall Construction Co. was the Contractor.

YOLO COUNTY

Construction is in progress for grading and paving with asphalt concrete 5.8 miles of state highway between Bretona and Dunnigan. F. R. Baker is resident engineer.

YUBA COUNTY

A 20-foot Portland cement concrete pavement through Wheatland has been completed by C. W. Wood, the contractor. J. D. Green was resident engineer in charge of the work.

LIST OF HIGHWAY BIDS AND AWARDS

For September

BUTTE COUNTY—Between north city limits, Chico, and northerly county boundary, 5 miles pit run gravel borders. Dist. III, Rt. 3, Sec. D. Hemstreet & Bell, Marysville, \$6,000; Chas. A. Howard, Richmond, \$5,910; F. J. Chesson, Yuba City, \$6,000. Contract awarded to C. Mankel, Sacramento, \$4,470.

COLUSA COUNTY—Between Williams and Maxwell, 8.1 miles to be surfaced with a gravel base. Dist. III, Rt. 7, Sec. C. Basich Bros. Const. Co., Torrance, \$111,470; Fredrickson-Watson Const. Co., & Fredrickson Bros., Oakland, \$127,800; Lilly, Willard & Biasotti, Stockton, \$130,640; Clyde W. Wood, Stockton, \$113,600; J. C. Compton, McMinnville, Oregon, \$120,700; V. R. Dennis Const. Co., San Diego, \$102,240; A. Teichert & Son, Inc., Sacramento, \$130,460; C. Mankel, Sacramento, \$121,410; Hemstreet & Bell, Marysville, \$122,120; A. Frederick Anderson, Oakland, \$119,990. Contract awarded to D. McDonald, Sacramento, \$95,140.

COLUSA COUNTY—Between 1 mile south of Arbuckle and Geneva, 5 miles of pit run gravel borders. Dist. III, Rt. 7, Sec. A. Pereira & Reed, Tracy, \$6,180; A. Teichert & Son, Inc., Sacramento, \$6,720; Harms Bros., Galt, \$4,950; Hemstreet & Bell, Marysville, \$9,000; C. Mankel, Sacramento, \$5,580; Chas. A. Howard, Richmond, \$7,590; J. R. Reeves,

Sacramento, \$7,320; F. J. Chesson, Yuba City, \$5,130. Contract awarded to H. Sykes, Paterson, \$4,650.

EL DORADO COUNTY—Between Clark's corner and Placerville, about 1.7 miles to be graded and surfaced with untreated crushed gravel or stone. Dist. III, Rt. 11, Section C. W. H. Hauser, Oakland, \$94,512; Clark & Henry Const. Co., San Francisco, \$105,827; Contoules Const. Co., San Francisco, \$105,985; Larsen Bros., Galt, \$105,156; E. C. Coats, Sacramento, \$84,405; Granfield, Farrar & Carlin, San Francisco, \$100,171; Chiaris & Sutsos, San Francisco, \$92,463; George Polock Co., Sacramento, \$96,216; A. Teichert & Son, Inc., Sacramento, \$99,823; Adams Const. Co., Angels Camp, \$92,252; Finnell Co., Inc., Sacramento, \$120,302; J. M. De Luca, Oakland, \$104,551; Hemstreet & Bell, Marysville, \$90,825; Kern & Kibbe, San Francisco, \$98,403. Contract awarded to C. Emil Force, Piedmont, \$83,909.

LOS ANGELES COUNTY—Between Tunnel Station and Santa Clara River Bridge, 8.6 miles, heavy fuel oil to be furnished and applied to shoulders. Dist. VII, Rt. 4, Sec. F. Orange County Refining Co., Los Angeles, \$5,233; Square Oil Co., Inc., Los Angeles, \$5,348; Calif. Road Oil Service Co., Wilmington, \$5,462; Leonard C. Pulley, Long Beach, \$5,615; Gilmore Oil Co., Ltd., Los Angeles, \$61,112. Contract awarded to G. M. Duntley, Los Angeles, \$4,469.

LOS ANGELES COUNTY—Reinforced girder bridge across Castaic Creek about one-half mile north of Castaic Junction consisting of seven 35-foot spans on concrete pile bents and concrete abutments with pile founds. Dist. VII, Rt. 4, Sec. A. M. H. Sloocum, Pasadena, \$36,219; George J. Ulrich Const. Co., Modesto, \$35,695; Gist & Bell, Arcadia, \$35,800; R. R. Bishop, Long Beach, \$37,700; Byerts & Dunn, Los Angeles, \$35,643; R. H. Travers, Los Angeles, \$32,847; Oberg Bros., Los Angeles, \$32,166; A. R. Bodenhamer, Carpinteria, \$34,841. Contract awarded to Carpenters Bros., Inc., Beverly Hills, \$31,149.

MENDOCINO COUNTY—Erection and completion of a maintenance station at Ukiah. Dist. IV, Rt. 1, Sec. C. Chas. Swanfelt, Ukiah, \$14,554; McCarthy-Johanns, San Francisco, \$13,248; Crawford & Baker, Ukiah, \$16,781; Chas. W. Gibson, Ukiah, \$13,504; Spivock & Spivock, San Francisco, \$18,400; J. W. Cobby & Son, San Francisco, \$13,453. Contract awarded to Louis Halvorsen, Santa Rosa, \$13,166.

TRINITY COUNTY—Between westerly boundary and Burnt Ranch, about 0.8 mile to be graded. Dist. I, Rt. 20, Sec. C. W. C. Colley, Berkeley, \$36,774; Contoules Const. Co., San Francisco, \$44,098; Engelhart Paving & Const. Co., Eureka, \$37,980; Chigris & Sutsos, San Francisco, \$35,996; Finnell Co., Inc., Sacramento, \$59,800; Hemstreet & Bell, Marysville, \$32,017; J. M. De Luca, Oakland, \$43,070. Contract awarded to H. H. Boomer, San Francisco, \$31,476.

YOLO COUNTY—Between Cache Creek and Zamora, 5.9 miles of pit run gravel borders. Dist. III, Rt. 7, Sec. B. Pereira & Reed, Tracy, \$5,678; A. Teichert & Son, Inc., Sacramento, \$6,596; Hemstreet & Bell, Marysville, \$7,820; Chas. A. Howard, Richmond, \$5,610; C. Mankel, Sacramento, \$5,168; Chief Const. Co., Oakland, \$7,990; F. J. Chesson, Yuba City, \$4,624; J. R. Reeves, Sacramento, \$5,236; Leroy Kerr, Yolo, \$4,488. Contract awarded to Harms Bros., Galt, \$4,216.

Butler: "Sir, your wife has eloped in the car with the chauffeur!"

Doctor: "Dammit! Where will I find another like her; why I used to get twenty miles to the gallon out of the old crate."—*Exchange*.

ARCHITECTURAL AWARDS**For September**

SAN DIEGO STATE TEACHERS COLLEGE—Contract for Electrical Service awarded to Electric Company of Los Angeles for \$8,844.

Contract for Service Connection awarded to W. H. Robinson of Los Angeles, \$25,676.

PRESTON SCHOOL OF INDUSTRY, Ione—Contract for General Work for Domestic Water Supply, awarded to Guth and Fox of Sacramento for \$8,376.

PACIFIC COLONY, Spadra—Contract for installation of Water Tube Boiler and Accessories, awarded to R. G. Meyler Corporation of Los Angeles for \$12,230.

WHITTIER STATE SCHOOL—Contract for installation of Water Tube Boiler and Accessories, awarded to R. G. Meyler Corporation of Los Angeles for \$13,170.

Correction—It was announced in the last issue that R. R. Jones Electric Company of South Pasadena was awarded contract for electrical work on the Kitchen and Commissary Buildings. This award has been made to the American Electric Construction Company of Los Angeles for \$2,714.

WATER APPLICATIONS AND PERMITS

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

BUTTE COUNTY—Permit 3554, Application 6233. Issued to Division of Highways, Sacramento, September 5, 1930, for 0.025 c.f.s. from 2 unnamed springs in Sec. 24, T. 20 N., R. 4 E., M. D. M., for domestic purposes. Estimated cost \$150.

BUTTE COUNTY—Permit 3555, Application 6234. Issued to Division of Highways, Sacramento, September 5, 1930, for 0.025 c.f.s. from Cherokee Creek in Sec. 10, T. 19 N., R. 4 E., M. D. M., for domestic purposes. Estimated cost \$300.

LOS ANGELES COUNTY—Permit 3556, Application 6025. Issued to Geo. H. Lettau, Los Angeles, September 5, 1930, for 0.29 c.f.s. from seven unnamed springs, 1, 2, 3, 4, 5, 7 in Sec. 31, T. 6 N., R. 13 W., No. 6 in Sec. 1, T. 5 N., R. 14 W., S. B. M., for irrigation and domestic on 230 acres.

MONO COUNTY—Permit 3557, Application 6278. Issued to A. J. Warrington, Bridgeport, September 6, 1930, for 3 c.f.s. from Dog Creek in Sec. 16, T. 3 N., R. 26 E., M. D. M., for mining purposes. Estimated cost \$1,500.

SUTTER COUNTY—Permit 3558, Application 6348. Issued to C. Fred Holmes et al., Woodland, September 10, 1930, for 12.82 c.f.s. from East dredge cut of Sutter By-pass in Sec. 3, T. 12 N., R. 3 E., M. D. M., for irrigation on 725.67 acres. Estimated cost \$6,800.

SUTTER COUNTY—Permit 3559, Application 6581. Issued to C. Fred Holmes et al., Woodland, September 10, 1930, for 10 c.f.s. from East dredge cut Sutter By-pass in Sec. 19, T. 13 N., R. 3 E., and Sec. 3, T. 12 N., R. 3 E., M. D. M., for duck ponds.

SUTTER COUNTY—Permit 3560, Application 6582. Issued to C. Fred Holmes et al., Woodland, September 10, 1930, for 47.26 c.f.s. from East dredge cut of Sutter By-pass in Sec. 19, T. 13 N., R. 3 E., and Sec. 2, T. 12 N., R. 3 E., M. D. M., for irrigation on 1897.65 acres. Estimated cost \$15,000.

SIERRA COUNTY—Permit 3561, Application 6306.

Issued to G. de Bretteville, Venice, September 11, 1930, for 3 c.f.s. from 5 unnamed springs in Secs. 26 and 27, T. 21 N., R. 10 E., M. D. M., for mining purposes. Estimated cost \$250.

MONO COUNTY—Permit 3562, Application 6674. Issued to L. L. Alauzet, Los Angeles, September 15, 1930, for 200 g.p.d. from Rock Creek in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic purposes. Estimated cost \$250.

SAN JOAQUIN COUNTY—Permit 3563, Application 6712. Issued to Frank Picardo et al., Stockton, September 13, 1930, for 0.92 c.f.s. from San Joaquin River in Sec. 5, T. 1 S., R. 6 E., M. D. M., for irrigation and domestic purposes on 73.7 acres. Estimated cost \$3,000.

HUMBOLDT COUNTY—Permit 3564, Application 6524. Issued to F. A. Leach and F. D. Smith, Fortuna, September 13, 1930, for 0.54 c.f.s. from Eel River in Sec. 24, T. 1 N., R. 1 E., S. B. M., for irrigation on 42.6 acres. Estimated cost \$200.

EL DORADO COUNTY—Permit 3565, Application 6685. Issued to J. S. Goldie, Sacramento, September 19, 1930, for 400 g.p.d. from unnamed creek in Sec. 19, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$200.

RIVERSIDE COUNTY—Permit 3566, Application 6661. Issued to J. O. Blackburn, Hemet, September 19, 1930, for 0.006 c.f.s. from Bee Canyon Springs in Sec. 12, T. 5 S., R. 1 E., S. B. M., for irrigation and domestic on 5 acres. Estimated cost \$3,000.

EL DORADO COUNTY—Permit 3567, Application 6679. Issued to Sierra Camps, Inc., Berkeley, September 22, 1930, for 0.1 c.f.s. from Ralston Creek in Sec. 34, T. 12 N., R. 17 E., M. D. M., for recreation and domestic purposes. Estimated cost \$200.

FRESNO COUNTY—Permit 3568, Application 6684. Issued to Sherley De Vine, Dunlap, September 23, 1930, for 0.01 c.f.s. from unnamed spring in Sec. 4, T. 14 S., A. 27 E., M. D. M., for irrigation, domestic and stockwatering on 1 acre. Estimated cost \$2.50.

SAN BERNARDINO COUNTY—Permit 3569, Application 6592. Issued to John M. Willoughby, Los Angeles, September 23, 1930, for 0.5 c.f.s. from West Fork Dry Creek in Sec. 15, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic on 40 acres. Estimated cost \$600.

MODOC COUNTY—Permit 3570, Application 6681. Issued to C. C. Jones, Cedarville, September 24, 1930, for 3 c.f.s. from Steamboat Creek in Sec. 10, T. 41 N., R. 16 E., M. D. M., for irrigation on 130 acres.

SAN BERNARDINO COUNTY—Permit 3571, Application 6663. Issued to Otto E. Kanka, Lucerne Valley, September 24, 1930, for 0.5 c.f.s. from 2 unnamed springs in Sec. 10, T. 3 N., R. 1 W., S. B. M., for irrigation and domestic on 80 acres. Estimated cost \$3,000.

SAN JOAQUIN COUNTY—Permit 3572, Application 5248. Issued to Banta Carbona Irrigation Dist., Tracy, September 26, 1930, for 40 c.f.s. from San Joaquin River in Sec. 34, T. 2 S., R. 6 E., M. D. M., for irrigation and domestic on 18,321.19 acres. Estimated cost \$334,000.

EL DORADO COUNTY—Permit 3573, Application 6626. Issued to El Dorado National Forest, Placerville, September 25, 1930, for 0.0019 c.f.s. from Hemlock Creek in Sec. 35, T. 12 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$250.

EL DORADO COUNTY—Permit 3574, Application 6627. Issued to 391 Dorado National Forest, Placerville, September 25, 1930, for 0.0015 c.f.s. from Hemlock Creek in Sec. 35, T. 12 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$200.

BUTTE COUNTY—Permit 3575, Application 6697. Issued to H. N. Dally, Magalia, September 26, 1930, for 2 c.f.s. from Middle Butte Creek in Sec. 34, T. 23 N., R. 3 E., M. D. M., for mining and domestic purposes. Estimated cost \$500.

SAN BERNARDINO COUNTY—Permit 3576, Application 6687. Issued to Stanley Vissel, Los Angeles, September 27, 1930, for 446 g.p.d. from unnamed spring in Sec. 9, T. 2 N., R. 3 W., S. B. M., for domestic purposes. Estimated cost \$300.

SISKIYOU COUNTY—Permit 3577, Application 6619. Issued to John A. Foss, Hamburg, September 27, 1930, for 9.25 c.f.s. from Carolina Creek in Sec. 13, T. 46 N., R. 12 W., M. D. M., for irrigation of 20 acres. Estimated cost \$500.

SANTA CLARA COUNTY—Permit 3578, Application 6601. Issued to G. T. Letcher, San Jose, September 29, 1930, for 0.08 c.f.s. from unnamed spring in Sec. 10, T. 7 S., R. 3 W., M. D. M., for irrigation and domestic purposes.

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

LOS ANGELES COUNTY—Application 6785. B. F. Porter Estate (a corporation), 58 Sutter St., San Francisco, for 0.50 c.f.s. from Mormon Canyon Creek tributary to Browns Canyon thence San Fernando Valley to be diverted in Sec. 32, T. 3 N., R. 16 W., S. B. B., and M., for domestic and irrigation of 40 acres. Estimated cost \$2,000.

SHASTA COUNTY—Application 6786. August L. Cox and W. E. Winston, c/o J. P. Kelly, 695 10th St., Sacramento, for 0.93 c.f.s. from Nelson Creek tributary to Pit River to be diverted in Sec. 29, T. 37 N., R. 1 E., M. D. M., for irrigation and domestic purposes. Estimated cost \$1,200.

HUMBOLDT COUNTY—Application 6787. C. M. Salyer, Salyer, Trinity County, for 50 c.f.s. from Madden (sometimes called Campbell) Creek tributary to South Fork of Trinity River to be diverted in Sec. 20, T. 6 N., R. 5 E., H. M., for mining purposes. Estimated cost \$91,000.

TRINITY COUNTY—Application 6788. Mrs. Chas. H. Miller, Chico, for 600 g.p.d. from unnamed spring tributary to S. Fk. Trinity River to be diverted in Sec. 19, T. 1 S., R. 8 E., H. M., for domestic purposes. Estimated cost \$600.

CALAVERAS COUNTY—Application 6789. Lloyd R. Fronsefeld, 929 N. Eldorado St., Stockton, for 500 g.p.d. from Big Meadow Creek tributary to N. Fk. Stanislaus River to be diverted in Sec. 32, T. 7 N., R. 17 E., M. D. M., for domestic use.

BUTTE COUNTY—Application 6790. Edward Steadman, Oroville, for 3 c.f.s. from Feather River tributary to Sacramento River to be diverted in Sec. 27, T. 18 N., R. 3 E., M. D. M., for domestic and irrigation on 253.117 acres. Estimated cost \$8,000.

SIERRA COUNTY—Application 6791. William F. Bickel, Palace Hotel, San Francisco, for 25 c.f.s. from Goodyear Creek tributary to N. Fk. Yuba River to be diverted in Sec. 9, T. 20 N., R. 10 E., M. D. M., for mining purposes.

INYO COUNTY—Application 6792. A. Z. Borden & James Brown, Skeleton Mining Co., c/o James Brown, 7712 Hampton Ave., Hollywood, for 0.05 c.f.s. from 4 springs tributary to Emigrant Canyon thence Death Valley to be diverted in Secs. 31 and 32, T. 17 S., R. 14 E., M. D. M., for mining, milling and domestic use. Estimated cost \$1,000.

KERN COUNTY—Application 6793. J. R. Blanco, Maricopa, for 720 g.p.d. from unnamed spring tributary to Stork Creek, thence Kern River to be diverted in Sec. 35, T. 28 S., R. 30 E., M. D. M., for stock-water purposes.

MONTEREY COUNTY—Application 6794. Stuart Haldorn, c/o Agnew & Boekel, Atty.s., Federal Reserve Bank Bldg., San Francisco, for 2 c.f.s. from Higuera Creek tributary to Sur River to be diverted in Sec. 24, T. 19 S., R. 1 E., M. D. M., for power purposes. 20 theoretical horsepower to be developed.

MONTEREY COUNTY—Application 6795. Stuart Haldorn, c/o Agnew & Boekel, Atty.s., Federal Reserve Bank Bldg., San Francisco, for 0.2 c.f.s. from Higuera Creek tributary to Sur River to be diverted in Sec. 24, T. 19 S., R. 1 E., M. D. M., for irrigation and domestic on 10 acres.

HUMBOLDT COUNTY—Application 6796. State of California, Department of Public Works, Division of Highways, Sacramento, for 0.0015 c.f.s. from unnamed spring tributary to S. Fk. of Eel River to be diverted in Sec. 28, T. 2 S., R. 3 E., H. M., for recreational purposes. Estimated cost \$250.

EL DORADO COUNTY—Application 6797. Gertrude E. White, Woodland, for 200 g.p.d. from Forni Creek tributary to S. Fk. American River to be diverted in Sec. 24, T. 11 N., R. 16 E., M. D. M., for domestic purposes. Estimated cost \$50.

SIERRA COUNTY—Application 6798. Kate Hardy Mining Co., c/o R. F. Taylor, Downieville, for total of 0.2 c.f.s., 0.1 from each of 2 unnamed ravines tributary to Woodruff Creek, thence N. Fk. Yuba River to be diverted in Sec. 19, T. 19 N., R. 10 E., M. D. M., for mining and domestic purposes. Estimated cost \$650.

TUOLUMNE COUNTY—Application 6799. Oakland Piedmont Council, Boy Scouts of America, 221 Thayer Bldg., Oakland, for 0.1 c.f.s. from Middle Fk. Tuolumne River tributary to Tuolumne River to be diverted in Sec. 15, T. 1 S., R. 19 E., M. D. M., for recreational and domestic purposes. Estimated cost \$1,500.

PLUMAS COUNTY—Application 6800. S. E. Colburn & A. E. Banks, c/o S. E. Colburn, Crescent Mills,

for 1.0 c.f.s. from unnamed stream tributary to Indian Creek, thence N. Fk. Feather River to be diverted in Sec. 35, T. 26 N., R. 9 E., M. D. M., for power and domestic purposes. Estimated cost \$2,000.

EL DORADO COUNTY—Application 6801. Frank La Montagne, Walter Kurtz & Carl Larsen, c/o Frank La Montagne, Antioch, for 600 g.p.d. from unnamed spring tributary to S. Fk. American River to be diverted in Sec. 29, T. 11 N., R. 15 E., M. D. M., for domestic purposes. Estimated cost \$30.

SAN JOAQUIN COUNTY—Application 6802. Western Pacific Railroad Co., c/o J. W. Williams, City Engr., 220 Montgomery St., San Francisco, for 0.855 c.f.s. from Potato Slough tributary to S. Fk. Mokelumne River to be diverted in Sec. 13, T. 3 N., R. 3 E., M. D. M., for industrial purposes. Estimated cost \$11,500.

EL DORADO COUNTY—Application 6803. May A. Sanborn, 547 Ralston St., Reno, Nevada, for 0.025 c.f.s. from Cox Creek tributary to S. Fk. American River to be diverted in Sec. 21, T. 11 N., R. 14 E., M. D. M., for domestic and fire protection.

MONTEREY COUNTY—Application 6804. Fort Kiamath Meadows Co., c/o C. N. Hawkins, Hollister, for 190 c.f.s. and 16 ac. ft. from Peach Tree Creek tributary to San Lorenzo Creek to be diverted in Sec. 12 (direct div.) T. 30 S., R. 10 E., M. D. M., (storage) Sec. 20, T. 29 S., R. 11 E., M. D. M., for irrigation. Estimated cost \$3,000.

MENDOCINO COUNTY—Application 6805. L. A. Howie, c/o A. L. Wenck, Atty., Ukiah, for 0.14 c.f.s. from Russian River (Redwood Valley Br.) tributary to Russian River to be diverted in Sec. 32, T. 17 N., R. 12 W., M. D. M., for irrigation and domestic purposes. Estimated cost \$1,000.

TRINITY COUNTY—Application 6806. John H. DeQuier, 57 W. 44th St., New York City, for 4 c.f.s. from Scorpion Creek tributary to Trinity River to be diverted in Sec. 4, T. 37 N., R. 7 W., M. D. M., for power purposes. (45.45 h.p.)

MERCED COUNTY—Application 6807. El Nido Irrigation Dist., Bank of America Bldg., Stockton, 30 c.f.s. from (1) Deadman and (2) Dutchman Creek tributary to (1) San Joaquin River, (2) Deadman Creek to be diverted in Sec. (1) 26 and (2) 35, T. 8 S., R. 14 E., M. D. M., for irrigation and domestic purposes. Estimated cost \$135,000.

MONO COUNTY—Application 6808. Wm. Symons, Box 118, Laws, for 3 c.f.s. from an abandoned well tributary to Adobe Creek to be diverted in Sec. 29, T. 1 N., R. 30 E., M. D. M., for irrigation purposes.

SONOMA COUNTY—Application 6809. Albert P. Kugler, 1307 Webster St., San Francisco, for 0.027 c.f.s. from Porter Creek tributary to Mark West Creek and Russian River to be diverted in Sec. 14, T. 8 N., R. 7 W., M. D. M., for irrigation and domestic purposes. (24 acres). Estimated cost \$750.

DAM APPLICATIONS AND APPROVALS

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources during the month of September, 1930.

MODOC COUNTY—Rye Grass Swale Dam No. 150. First National Bank of Alturas, Alturas, owner; earth fill, 8.8 feet above streambed with a storage capacity of 160 acre-feet, situated on Rye Grass Swale tributary to Canyon Creek, in Sec. 25, T. 41 N., R. 11 E., M. D. M., for storage purposes for irrigation use.

NEVADA COUNTY—Shady Creek Dam No. 312. Empire Mines, Inc., San Francisco, owner; gravity, 12.3 feet above streambed, situated on Shady Creek tributary to South Yuba River in Sec. 15, T. 17 N., R. 8 E., M. D. M., for diversion purposes for irrigation use.

NEVADA COUNTY—Pine Grove Dam No. 312-2. Empire Mines, Inc., San Francisco, owner; earth fill, 29 feet above streambed with a storage capacity of 250 acre-feet, situated on an unnamed creek tributary to South Yuba River in Sec. 19, T. 17 N., R. 8 E., M. D. M., for storage purposes for mining use.

INYO COUNTY—Horton Lake Dam No. 74. Round Valley Irrigation District, Bishop, owner; rock fill, 12 feet above streambed with a storage capacity of 20

acre-feet, situated on Horton Creek, tributary to Owens River, located in Sec. 28, T. 7 S., R. 30 E., M. D. M., for storage purposes for irrigation use. Estimated cost \$1,500.

SACRAMENTO COUNTY—Willow Hill Dam No. 453-2. Natomas Water Company, Sacramento, owner; earth fill, 16 feet above streambed with a storage capacity of 125 acre-feet, located in Sec. 12, T. 9 N., R. 8 E., M. D. M., for storage purposes for irrigation and mining use.

PLUMAS COUNTY—Grizzly Creek Dam No. 285. Clover Valley Lumber Company, Loyalton, owner; buttress, 30 feet above streambed with a storage capacity of 174 acre-feet, situated on Grizzly Creek, tributary to Middle Fork of Feather River in Sec. 20, T. 23 N., R. 14 E., M. D. M., for storage and diversion purposes for various uses.

SIERRA COUNTY—Lower Sardine Dam No. 294-4. E. A. & J. O. Hayes, San Jose, owner; wood, 6 feet above streambed with a storage capacity of 62 acre-feet, situated on North Fork of Yuba River, tributary to Yuba River in Sec. 9, T. 20 N., R. 12 E., M. D. M., for diversion purposes for power use.

SIERRA COUNTY—Summit Lake Dam No. 294-5. E. A. & J. O. Hayes, San Jose, owner; rock and earth fill, 6 feet above streambed with a storage capacity of 106 acre-feet, situated on North Fork of Yuba River tributary to Yuba River in Sec. 21, T. 21 N., R. 12 E., M. D. M., for storage purposes for power use.

RIVERSIDE COUNTY—Reynolds Slough Dam No. 823. Santa Ana River Development Company of Anaheim, owner; earth fill, situated on Mill Creek tributary to Santa Ana River, for storage purposes for recreation use.

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

STANISLAUS COUNTY—La Grange Dam No. 68-2. Turlock & Modesto Irrigation District, Turlock and Modesto, owner; gravity arch, 131 feet above streambed with a storage capacity of 3000 acre-feet, situated on Tuolumne River tributary to San Joaquin River in Sec. 16, T. 3 S., R. 14 E., M. D. M., for storage purposes for irrigation use. Estimated cost of enlargement \$7,500. Fees paid \$75.

MODOC COUNTY—Porter Dam No. 162. Pearl F. Porter, Alturas, owner; earth and rock fill, 22 feet above streambed with a storage capacity of 250 acre-feet, situated on a ditch tributary to Parker Creek in Sec. 12, T. 42 N., R. 13 E., M. D. M., for storage purposes for irrigation use. Estimated cost of enlargement \$750. Fees paid \$20.

LOS ANGELES COUNTY—Whittier Reservoir No. 4. Dam No. 18-2. City of Whittier, Whittier, owner; earth fill, 54½ feet above streambed with a storage capacity of 32.3 acre-feet, situated on a canyon tributary to San Gabriel River in Sec. 16, T. 2 S., R. 11 W., S. B. M., for storage purposes for municipal use. Estimated cost \$65,000. Fees paid \$650.

SAN BENITO COUNTY—Hawkins Dam No. 651. C. N. Hawkins, Hollister, owner; earth fill, 67 feet above streambed with a storage capacity of 1000 acre-feet, situated on Los Viboras Creek tributary to Fajaro River, located on Rancho Ausaymas, San Felipe, for storage purposes for irrigation use. Estimated cost of enlargement \$3,000. Fees paid \$30.

LOS ANGELES COUNTY—Pine Canyon Dam No. 19. City of Pasadena, Pasadena, owner; gravity, 265 feet above streambed with a storage capacity of 63,660 acre-feet situated on San Gabriel River, tributary to Pacific Ocean in Sec. 13, T. 1 N., R. 10 W., S. B. M., for storage purposes for municipal use. Estimated cost \$6,500,000. Fees paid \$10,250.

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

MODOC COUNTY—Cummings No. 2 Dam No. 148-2. John O. Cummings, Alturas, owner; earth, situated on Rock Creek, tributary to Pit River in Sec. 25, T. 43 N., R. 11 E., M. D. M. Nature of repairs, pave spillways.

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

MODOC COUNTY—James Porter Dam No. 142. James C. & Phear E. Porter, Alturas, owners; earth fill, situated on an unnamed drainage, tributary to Parker Creek in Sec. 1, T. 42 N., R. 13 E., M. D. M.

MODOC COUNTY—Crowder Dam No. 128. Lake Short Cattle Company, Davis Creek, owner; earth fill, situated on Franklin Creek tributary to North Fork of Pit River, in Sec. 7, T. 44 N., R. 14 E., M. D. M.

MODOC COUNTY—Kelley Dam No. 152. Kelley & Meckfessel, Davis Creek, owners; earth fill, situated on tributary of Canyon Creek tributary to Pit River in Sec. 6, T. 41 N., R. 11 E., M. D. M.

MODOC COUNTY—Dannhauser Dam No. 161. Weber & Moffitt, Alturas, owner; earth fill, situated on a ditch tributary to Pit River in Sec. 8, T. 41 N., R. 13 E., M. D. M.

MODOC COUNTY—Upper Pasture Dam No. 161-2. Weber & Moffitt, Alturas, owner; earth fill, situated on Yankee Jim Slough tributary to Pit River in Sec. 3, T. 41 N., R. 13 E., M. D. M.

MODOC COUNTY—Nelson Spring Dam No. 137. J. D. Flournoy, Likely, owner; earth fill, situated on Nelson Spring tributary to Pit River in Sec. 33, T. 40 N., R. 13 E., M. D. M.

ALPINE COUNTY—Lower Blue Lake Dam No. 97-62. Pacific Gas & Electric Co., San Francisco, owner; earth fill, 43 feet above streambed with a storage capacity of 4130 acre-feet, situated on Blue Creek for storage purposes for power use.

LASSEN COUNTY—Fleming Dam No. 241. Richard Casneleas, Wendel, Lassen County, owner; earth, situated on unnamed drainage tributary to Ash Creek in Sec. 6 T., 37 N., R. 11 E. M. D. B. and M.

ALPINE COUNTY—Twin Lakes (American) No. 97-59. Pacific Gas & Electric Company, San Francisco, owner; arch dam, situated on branch of Silver Fork tributary to So. Fork American River in Sec. 22, T. 10 N., R. 17 E., M. D. B. and M.

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

MODOC COUNTY—Williams Dam No. 149. Sheldon Potter, San Francisco, owner; rock dam in Sec. 29, T. 43 N., R. 9 E., M. D. B. and M.

MODOC COUNTY—Duncan Dam No. 149-2. Sheldon Potter, San Francisco, owner; earth dam located in Sec. 23, T. 43 N., R. 9 E., M. D. B. and M.

MODOC COUNTY—Jacks Swamp Dam No. 149-3. Sheldon Potter, San Francisco, owner; rock dam, situated in Sec. 28, T. 43 N., R. 10, M. D. B. and M.

LASSEN COUNTY—Caribou Lake Dam No. 234. J. A. Bennett, Chico, owner; tributary to Susan River in Sec. 34, T. 31 N., R. 7 E., M. D. B. and M.

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

PLANS APPROVED

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

SOLANO COUNTY—Swanzy Dam No. 443. California and Hawaiian Sugar Refining Corp., San Francisco, owner; earth dam, 55 feet above streambed with a storage capacity of 107 acre-feet, located in Sec. 30, T. 3 N., R. 3 W., M. D. B. and M. For balancing purposes, for industrial use.

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

PLACER COUNTY—Kelley Lake Dam No. 97-24. Pacific Gas & Electric Company, San Francisco, owner; earth dam situated on Six Mile Valley tributary to North Fork American River in Sec. 25, T. 17 N., R. 12 E., M. D. B. and M.

ALPINE COUNTY—Twin Lakes (Electra) Dam No. 97-69. Pacific Gas & Electric Company, San Francisco, owner; earth dam situated on a small creek tributary to North Fork Mokelumne River in Sec. 25, T. 9 N., R. 18 E., M. D. B. and M.

ALPINE COUNTY—Upper Blue Lake Dam No. 97-70. Pacific Gas & Electric Company, San Francisco,

owner; earth dam situated on Blue Creek tributary to North Fork Mokelumne River in Sec. 18, T. 9 N., R. 19 E., M. D. B. and M.

ALPINE COUNTY—Lower Blue Lake Dam No. 97-62. Pacific Gas & Electric Company, San Francisco, owner; earth dam situated on Blue Creek tributary to North Fork Mokelumne River in Sec. 30, T. 9 N., R. 19 E., M. D. B. and M.

MODOC COUNTY—Crowder Dam No. 128. Lake Shore Cattle Company, Davis Creek, owner; earth dam situated on Franklyn Creek tributary to North Fork Pit River in Sec. 7, T. 44 N., R. 14 E., M. D. B. and M.

MODOC COUNTY—Kelley Dam No. 152. John Kelley and Gus Meckfessel, Davis Creek, owner; earth dam situated on creek tributary to Canyon.

MODOC COUNTY—Upper Pasture Dam No. 161-2. Weber and Moffitt, Alturas, owner; earth dam situated on Yankee Jim Slough tributary to Pit River in Sec. 3, T. 41 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Cummings Reservoir No. 2, No. 148-2. J. W. Cummings Estate, Alturas, owner; earth dam situated on Rock Creek tributary to Pit River in Sec. 25, T. 43 N., R. 11 E., M. D. B. and M.

MODOC COUNTY—Nelson Spring Dam No. 137. J. D. Flournoy, Lakely, owner; earth dam situated on Nelson Spring tributary to Pit River in Sec. 33, T. 49 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Dannhauser Dam No. 161. Weber & Moffitt, Alturas, owner; earth dam situated on ditch from Yankee Jim Slough tributary to Pit River in Sec. 8, T. 41 N., R. 13 E., M. D. B. and M.

MODOC COUNTY—Williams Dam No. 149. Sheldon Potter, San Francisco, owner; rock dam located in Sec. 29, T. 43 N., R. 9 E., M. D. B. and M.

MODOC COUNTY—Duncan Dam No. 149-2. Sheldon Potter, San Francisco, owner; earth dam located in Sec. 33, T. 43 N., R. 9 E., M. D. B. and M.

MODOC COUNTY—Jack's Swamp Dam No. 149-3. Sheldon Potter, San Francisco, owner; rock dam located in Sec. 28, T. 43 N., R. 10 E., M. D. B. and M.

LASSEN COUNTY—Caribou Lake Dam No. 234. J. A. Bennett, Chico, owner; earth dam situated on drainage tributary to Susan River in Sec. 34, T. 31 N., R. 7 E., M. D. B. and M.

LASSEN COUNTY—Fleming Dam No. 241. Richard Castneleas, Wendel, owner; earth dam situated on unnamed drainage tributary to Ash Creek in Sec. 5, T. 27 N., R. 11 E., M. D. B. and M.

AUTOING 25 YEARS AGO

How would you like to have an automobile that could make a trip from Los Angeles to Santa Barbara in a single day? This question may sound funny today, but it was asked in all seriousness 25 years ago in motordom when an endurance run was planned by the Automobile Club of Southern California and Los Angeles motoring enthusiasts.

The start was made from Los Angeles at 8 o'clock in the morning and it was expected the speedsters would arrive in Santa Barbara at 6 o'clock the same evening. This distance was 110 miles and only experienced motorists having high class cars attempted the stunt.

PANAMA CANAL ZONE—Engineers of the Panama Canal Zone have completed a survey for a highway across the Isthmus of Panama. The length of the road is 46 miles; the highest altitude reached 482 feet above sea level; number of bridges required, 46; number of culverts per mile, 10; estimated cost, \$6,000,000.

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

Traffic Safety Campaign Program for 1931 Told

Concentrating each month on a specific type of traffic law violation, a program for a continuous statewide effort during 1931 by the California Committee on Public Safety has been announced by Senator Arthur H. Breed, chairman of the committee. The committee is composed of representatives of forty organizations and state departments concerned with the traffic problem.

The success of the month to month campaigns which were begun last year, with each period devoted to a different phase of safe driving, has prompted the committee to formulate a program for another twelve months of activity along similar constructive lines. The program follows:

January—Failure to yield right of way at intersections.

February—Unlawfully passing standing street cars.

March—Failure to give required arm signals; failure to keep in the proper lane when turning; cutting in and other law violations when overtaking another motorist.

April—Excessive speed at intersections where view is obstructed.

May—Disobeying boulevard stop regulations.

June—Endangering safety of children at play; speed or inattention.

July—Railway stop signals (wig-wags).

August—Failure to keep to the right; "hogging the road."

September—Unlawful speed in school zones.

October—Inadequate brakes.

November—Illegal and glaring headlights.

December—Disobeying regulations for pedestrian protection.

While traffic authorities will intensify attention to certain enforcement provisions each month, there will be no let up in the general and systematic enforcement of all the laws.

SPEED LAWS ARE NOT SO NEW

At Boston, and in 1757—one hundred and seventy-three years ago—the board of "selectmen" passed an ordinance which read:

"Owing to the great danger arising oftentimes from coaches, sleighs, chairs and other carriages on the Lord's days, as people are going to or coming from the several churches in this town, being driven with great rapidity, and the public worship being oftentimes much disturbed by such carriages, it is therefore voted and ordered that no coach, sleigh, chair, chaise or other carriage at such times be driven at a greater rate than a foot-pace, on penalty to the master of the slave or servant so driving of the sum of 10 shillings."

STOP SIGN

Bridegroom—Step up, Bill, it's time to kiss the bride.

Bill—You're wrong, it's time to quit.—*Exchange.*

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Department of Public Works

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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, 1936