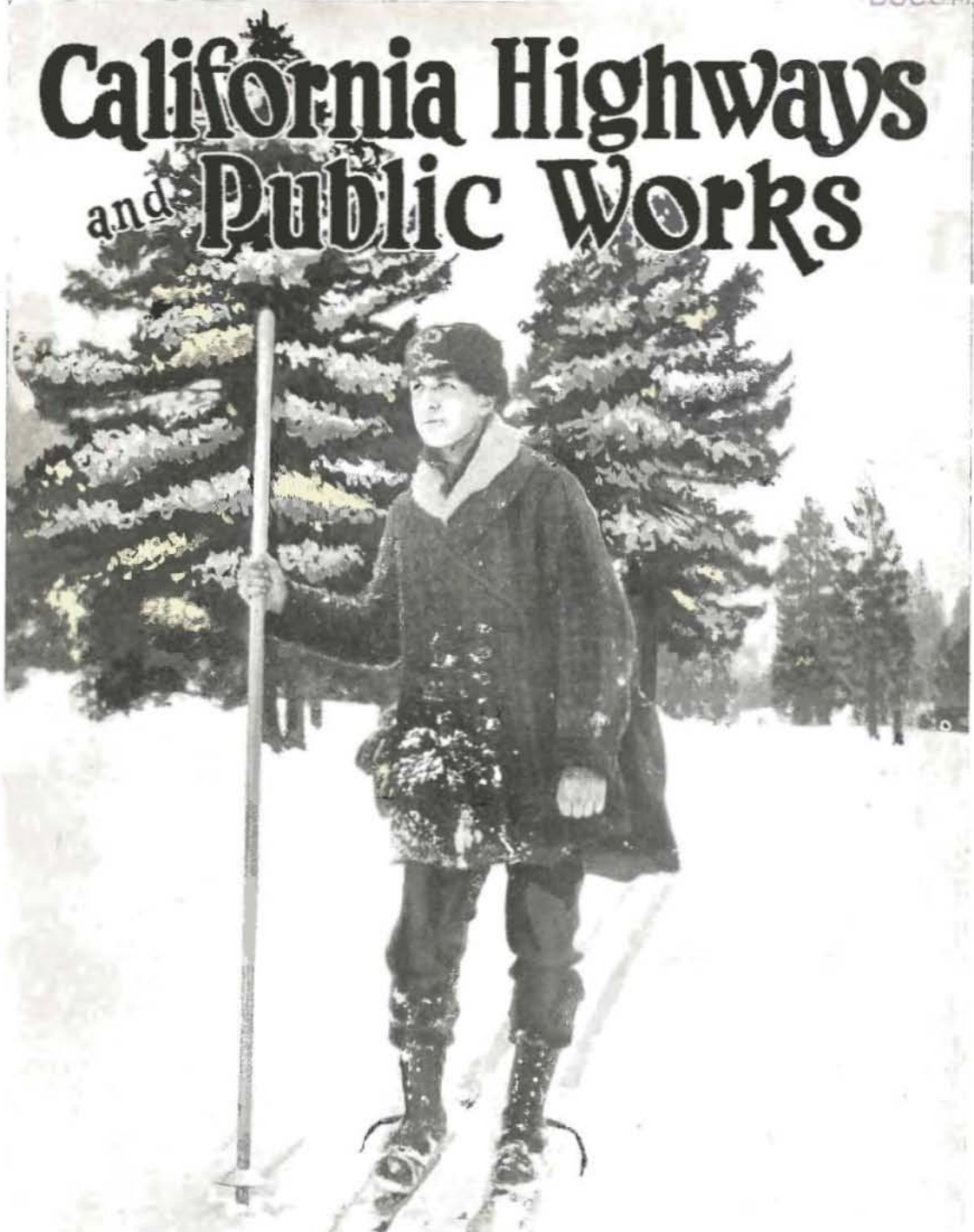


Public Works

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California Highways and Public Works



Official Journal of the Department of Public Works
State of California

NOVEMBER

1929



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Measuring the Water Crop In California's Snow Fields

By HARLOWE M. STAFFORD, Hydraulic Engineer, Division of Water Resources, State Department of Public Works

THROUGH appropriation by the 1929 legislature of \$30,000 for the biennium 1929-1931, the State of California, acting through its Department of Public Works, Division of Water Resources, has definitely entered the field of snow surveying.

The purpose of a state-wide snow survey



HARLOWE M. STAFFORD.

and the objects to be attained are more or less self-evident. The power companies and a few of the irrigation districts have recognized the value of knowing from snow surveys in the early spring what to expect as run-off from the snow in the period April to July or August. These agencies have, therefore, been doing snow survey work in California for some

time, varying from thirteen years for the South Yuba surveys of the Pacific Gas and Electric Company to one or two years work recently inaugurated by irrigation districts on the Middle Yuba, Merced, and South Kings rivers.

FUTURE VALUE

Looking into the not distant future, under the consummation of plans for a statewide coordinated use of water, now the subject of intensive administrative and legislative investigation and planning, a single great reservoir or group of reservoirs on one stream may be required to coordinate as many as seven apparently conflicting uses of water such as, irrigation, power, flood control, municipal, navigation, salinity control and hydraulic mining. In the intricate regulation that will be here required, the value and the necessity of run-off forecasts as derived from snow surveys and meteorological observations can hardly be questioned. It will be seen that the benefits to be derived from an adequate system of statewide snow surveys, and run-off predictions are not confined to the immediate

practical or local uses by power companies, irrigation districts, municipal districts, etc., in the administration of their projects. The broader necessity is for such information to guide the use of water from year to year over large areas such as the entire length of the Sacramento, the San Joaquin, and the Kings rivers.

The purpose of the California snow survey is not to supplant the work that is now being done by individual agencies but rather to cooperate with these agencies, to correlate, standardize and expand the present work and, as funds permit, to so extend the surveys that annual forecasts of run-off for all of the major stream basins of the Sierra may be possible.

Investigation was made of the methods used and results obtained in snow surveying by the



A snow surveyor at work.

agencies in California that have been doing this work and by other states. It was found that in most every case the surveys, when carefully conducted, had proven of practical value and that reliable forecasts of run-off were possible.

METHOD TO BE USED

As to the methods of snow surveying, the most successful and one most widely used is that pioneered and developed by Dr. J. E. Church, of the University of Nevada. This method, known as the percentage method, is that which California proposes to use in its work. Briefly, the procedure under the percentage method comprehends the determination of the water content of the snow cover at properly selected "snow courses" in each basin or region by means of suitable sampling apparatus and from the data obtained, the determination of the percentage relationship of the seasonal snow cover of that basin to its normal; under the assumption that such percentage is indicative of a corresponding percentage which the coming seasonal run-off in the stream below bears to its normal.

The percentage method relies upon the fact that the large storms which furnish the bulk of the winter snow are comparatively uniform in intensity over considerable areas and it is therefore possible to select a few snow survey



Sandbag shelter hut and snow survey headquarters on Mt. Rose.

courses distributed over characteristic parts of a stream basin, the averaged data from which will furnish a close index of the seasonal percentages of snow cover for the entire basin.

SELECTION OF COURSES

The selection of snow courses to properly represent each basin requires considerable care and after a year or two it may be necessary to change or substitute some of the first selections to finally obtain suitable and repre-

(Continued on page 19.)



Sampling the snow at Mt. Rose. The snow is as deep as the sampler is long.

How California is Solving the Problem of Separating Highways and Railroads

By HARRY McCLELLAND, Right of Way Agent, Division of Highways.

THE BOOKS abound with the ancient maxim "To state the problem is to solve it." This not so simple when we seek the solution of the tremendous task of eliminating the tragic dangers of grade crossings on the state highway system of California. At any rate here is the problem:

It is necessary for a motorist who seeks to travel the 7000-mile net work of state highways to traverse 559 railroad crossings. Of this number 96 have been separated, 35 by overhead crossings and 61 by subways, and over these our traveler may drive with ease and safety but woe to him if he does not "Stop, Look and Listen" on the other 463. To analyze a little further: Of these crossings at grade 87 are over spur and side tracks and 134 are within the corporate limits of cities.

We are of the opinion that eventually at least 25 per cent of these spur track crossings, especially those which intersect important arteries of traffic, must of necessity be eliminated. Nor do we minimize the importance of crossings within cities, but we will narrow our problem. *We have left, therefore, in California outside of municipalities state highways crossing 242 main line railroad tracks at grade.* This is the problem.

What of the solution?

The Department of Public Works, Division of Highways, is now embarked on the most comprehensive and ambitious program for the elimination of grade crossings ever undertaken in California. During the biennium commencing July 1, 1929, and ending June 30, 1931, there will have been constructed 24

overhead or subway structures on the more important roads and at the most dangerous railroad crossings. *On an average of once a month during the next two years there will be incorporated into the great highway system of California a grade separation.*

This program is all the more remarkable when we consider that after nearly 20 years of state highway organization there are now only 96 grade separations and that many of these were constructed prior to that time and inherited by the state from counties and cities.

Nor is that all. Plans are being completed which contemplate the elimination of at least 10 dangerous grade crossings by changing the routing and alignment of highways. The result will be, therefore, that in 1931, there will have been added 34 grade crossing eliminations.

To accomplish this entails an expenditure of upward of \$3,000,000, but it is difficult to measure in dollars and cents the protection of life and the insurance of safety which is commensurate with the

high standards which are being built into the highways of California.

Before the state launched upon this great undertaking there was prepared a complete and comprehensive schedule to be followed. All railroad companies whose interests were in any way involved were apprised of the plans and desires of the Department and the almost universal cooperation which was accorded is indicative of the vision and fairness of those men who control the destinies of the railroads of California.

By virtue of the Public Utilities Act, the

RAILROAD GRADE CROSSING SITUATION IN PERSPECTIVE

There are at the present time on the state highway system outside of municipalities 242 main line railroad tracks at grade.

On an average of once a month during the next two years there will be incorporated into the state highway system of California, a grade separation structure.

Plans are being completed which contemplate the elimination of at least ten dangerous grade crossings by changing the routing and alignment of highways.

Including main line grade crossings both within and without municipalities and grade crossings over spur tracks, there are at present 559 railroad crossings. Of these crossings at grade 87 are over spur and side tracks and 134 are within the corporate limits of cities. Eventually at least 25 per cent of these spur track crossings must be eliminated.

To date there have been 96 grade separation structures built, of which 35 are overhead crossings and 61 subways. In 1931 there will have been added 34 grade crossing eliminations.

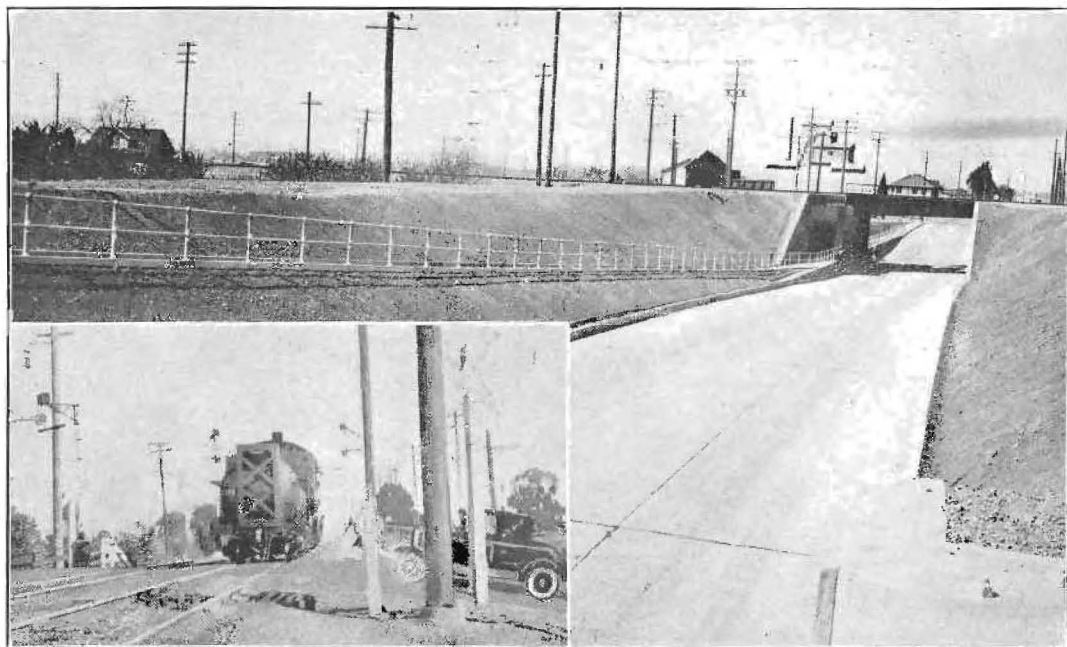
California Railroad Commission has jurisdiction to determine the necessity for a public crossing over a railroad, the manner of the crossing, the adequacy of design, and to apportion the cost of the construction between the railroad and the political subdivision affected. No grade separate structure may be erected without an order from the Commission and all plans for the same must be approved by that body.

There may be gleaned from a long line of decisions which the Commission has handed down, certain fundamental principles, which have become precedents to be followed. Of course every case presents a new problem and must be considered in its own particular merits, but certainly the following principles, governing the division of costs between the

3. Where a separation is constructed which does not close an existing grade crossing the Commission has generally divided the cost, 25 per cent to the railroad, and 75 per cent to the state.

These guideposts, governing the troublesome question of the conflicting equities in the allocation of costs are based upon the theory, which will be found running through countless decisions of the Railroad Commission and has become firmly fixed, that irrespective of priority of location the railroads have a continuing obligation to afford a safe and convenient means of crossing their right of way and tracks. This thought is clearly stated and the principle announced, in Decision 14403 wherein the Railroad Commission says:

"The question of the apportionment of the cost of



Before and after. The Brighton grade crossing as it was before a grade separation structure was built, and the present Brighton subway.

railroad and the state, are now definitely established.

1. Where a separation completely eliminates an existing grade crossing, the cost of the structure together with grade and alignment in conformity with highway standards is divided equally between the state and railroad. The state is charged with the cost of extra width of pavement in excess of the existing width and the railroad with the cost of providing for extra tracks.

2. The cost of the improvement or replacing at a different location of an inadequate existing separation is divided equally between the railroad and the state, excluding the paving of the highway outside the track supporting structure.

a grade separation as between the public and the railroads is one that generally is not completely susceptible of mathematical determination upon any basis of relative benefits, relative hazards or relative necessity. It is true, however, that railroads are always constructed with the hope and expectation that the communities which they are to serve will grow in population and prosperity. Such growth brings with it new and divers hazards and, at the same time, creates new obligations. On the other hand, it appears fair and just that the public, the growth of which in a large measure creates the new dangers and necessities, should bear a part of the cost of those facilities which will relieve these new conditions, and, on the other hand, it seems equally fair and just that the railroads which benefit directly



The twin subways at Serra in Orange County.

and in a vital manner from the very growth in population and traffic which creates the new hazards should share in the cost of minimizing them. The railroad, by its construction, incurs an obligation to reduce to a minimum the hazard and inconvenience to other traffic, that such a barrier interposes to free communication between the two portions of a community that it so divides. This obligation continues and increases with the development of the community



Undergrade crossing on state highway near Whittier in Los Angeles County consisting of two 30-foot roadways.

which it serves. The absence of any logical or mathematical measuring stick by which to test, the usual crossing separation cost apportionment problem, early led both this Commission and most parties appearing before it to the conclusion that a fair method would be the assessment of equal portions of the cost upon the two major interests, and the justice of this conclusion has seldom been questioned."



The Irvine overhead on the Coast Highway in Orange County.

Reports Progress In Registration Of Contractors

JAMES F. COLLINS, director of the Department of Professional and Vocational Standards, reported in part as follows to the October 30th meeting of the Governor's Council:

The work of the department during the past month has continued to be centered around the registration of contractors as the major activity. While the number of applications for licenses under the contractors' registration law has not been as many as should be the case, an increase in the daily number of applications received has been noted during the past two weeks. A plan of direct mail contact with all known contractors in California has been inaugurated, and after the sending of the second and final notice it will be necessary to take drastic action under the provisions of the law. Due to lack of information regarding the law, which has been found to be general throughout the construction industry, it is the policy of the department to reach all responsible contractors with adequate information before the penalties of the law are invoked.

CONTRACTORS REGISTRATION

Number of applications received.....	7,175
Number of applications returned.....	603
Number of applications approved.....	6,572
Number of licenses issued.....	6,572
Number of employees.....	15

In another decision the Commission said:

"In the vicinity of Sacramento, practically all railroads are on high fills or trestles which act as barriers to the safe and convenient flow of traffic and to free growth of the surrounding country areas. Even under ordinary conditions, the long, narrow right of way of a railroad with its high speed trains acts, to a certain extent, as such a barrier. The railroads have thus incurred an obligation to participate in the cost of providing reasonably safe and convenient means of allowing the public to travel across their lines."

That these propositions are readily accepted by the railroad is shown by the fact that rarely in recent years has it been necessary to appeal to the Railroad Commission to adjudicate differences between the railroads and the state, respecting the allocation of costs of grade separation structures.

When we first contemplate the elimination of grade crossings, the task looms gigantic, as indeed it is, but it is submitted that a continuation of the comprehensive program, which has been inaugurated will result in removing a great bulk of those hazards from the state highways of California, within the next decade.

Careless Faults of Careful Drivers

By EUGENE W. BISCAILUZ, Superintendent of the California Highway Patrol

MY FRIEND John — is a traveling salesman and wears out one car every year. He is a careful driver. John was in my office recently.

"I've never been in an accident although I've driven cars since they began making 'em," said John. "I never drive over about 40 and I seldom ever take any chances."

Two days later John was driving over a rolling country in the hills not far from Bakersfield, trying to get home that night. Just at the bottom of a short hill he overtook a truck loaded with farm produce. The truck was going exasperatingly slow. John fell in behind, shifted into second. Near the top, the truck almost stopped. John was now in low and angry. He stepped hard on the gas, threw the car into second again, swerved sharply to the left and zoomed by the truck just in time to meet a touring car head-on that was coming over the hill.

THE PRICE OF FOLLY

Fortunately, neither car was going very fast. John came out with a few scratches and the other driver had a broken leg. John's insurance company paid the hospital bills and had both cars repaired.

"I knew when I was doing it that I shouldn't," John confided to me afterward. "But dang it all, I got a little sore. I took the first chance in my life and got hooked."

But John is a careful driver!

Not long ago I was talking to George —, a theatrical agent. He buys big cars and drives them hard. He is an expert at the wheel and has an eye that measures distance and the approach of other cars to the

inch. He told me he had never had an accident of any kind.

"How fast do you drive?" I asked.

"O, not so fast," he said. "Thirty-five or forty on the curves. Fifty and sometimes sixty on the straight-away if none of your men are around."

"That's pretty fast, old boy," I warned.

"You may get away with it but you're taking a chance."

DISREGARDS JUDGMENT

One hot afternoon about a week later, George headed south from Fresno. Stopping for gas at a service station near the edge of the town he noted one of his tires had worn clear through the tread into the inner fabric.

"Hang it, I ought to have that tire taken off and my spare put on," he said to himself. "But I guess it'll be all right. I'm in an awful hurry."

On a level road with not a car in sight George forgot all about the weak tire and stepped his machine up to sixty.

He struck a small chuck hole and the tire went out with a

bang. Before he could control it, the car headed into a telephone pole and turned over twice. George crawled out not badly hurt but he will carry a scar the rest of his life over the right eye from flying glass. The car was a wreck.

ALL HAVE FAULTS

I could go on giving examples of this kind from now until doomsday. The point of it is that every man, no matter how careful he thinks he is as a driver has some faults that ought to be corrected or will make a slip that

TEN CARELESS FAULTS OF CAREFUL DRIVERS; ARE YOU GUILTY?

In this article Eugene M. Biscailuz, Superintendent of the California Highway Patrol, tells of accident-causing practices of motorists, who consider themselves as careful drivers. Here is the list:

Attempt to pass cars (not always, but occasionally) without knowing that you are in the clear;

Take a chance on weak tires;

"Go nowhere in a hurry"; in other words speed without anything to be gained by speed;

Give signals in a sloppy manner;

Cut corners at corners where you think traffic is light;

Follow other cars too closely;

Endanger coming traffic by glaring lights on your car, at the same time "cussing" other drivers for their lights;

Allow your rear light to be dimmed by dust or dirt;

Drive down steep grades in high gear;

Do your driving according to your mood: today carefully, tomorrow recklessly?

will spell disaster unless he is continuously on the alert.

John lost his temper; George was careless. And there you are.

Somebody does make slips, every day in the year. If you want proof look at our statistical records. More than 1000 killed in auto crashes during the first six months of the year and the total climbing steadily toward the 2000 mark! More than 25,000 persons injured in the state in motor mishaps in eight months!

ARE AVOIDABLE

It is not idle talk when we say 95 per cent of the accidents are avoidable. Out of the thousands of cases we have examined very few have been found where the circumstances were such as to make the accident unavoidable.

The automobile as it is built today is practically foolproof. The accidents due to faulty construction or to breakdowns in vital points, such as the steering gear, are almost negligible. Always, it is the driver; not the car.

It has been most interesting for us to find out that, as in John's case, most of the drivers involved in accidents, when pinned right down, will admit they were doing something they shouldn't have been doing and that *they knew it beforehand.*

PLENTY OF EXCUSES

"Yes, I had a feeling, I was going a little too fast." * * * "Well, I was about even with the train and I was a little afraid I couldn't make it but I took a chance." * * * "The hill did look a little steep but I thought I could make it all right in high and I would have been all right if I hadn't hit that gravel just as I put the brakes on." * * * "Sure, I knew I'd have to cut in but I didn't know the other car was coming quite so fast."

These are only a few of the excuses.

The truth of it is that thousands of persons who pride themselves on being careful drivers are guilty every now and then of "taking a chance." And no person is entitled to be called a careful driver unless he drives carefully 100 per cent of his time.

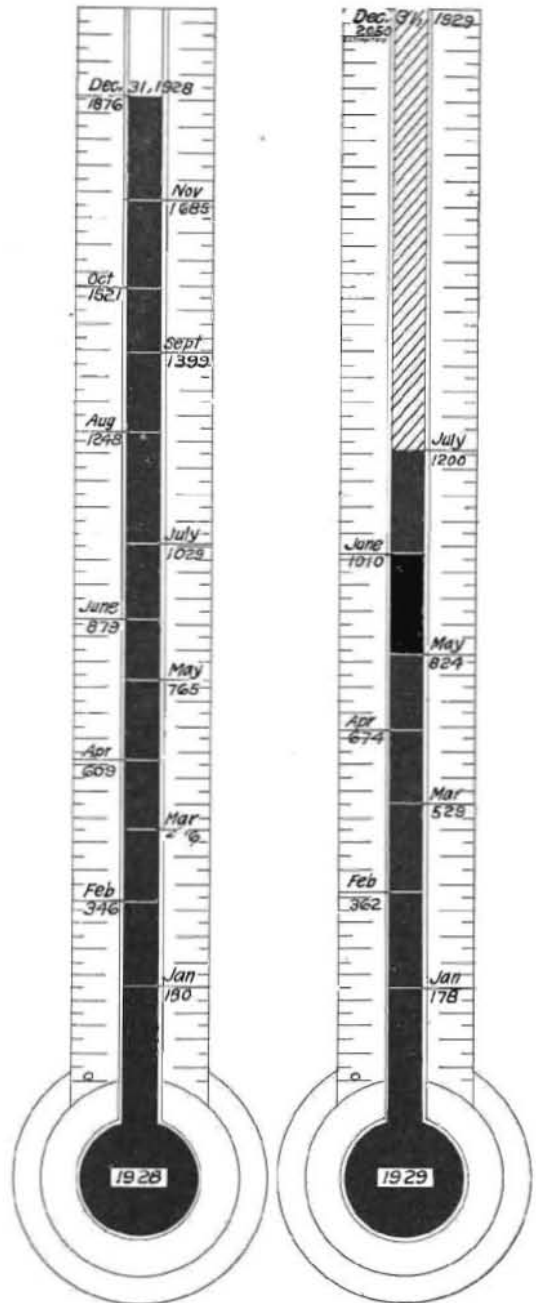
What would it have availed John had he passed the truck without accident? He possibly would have saved from 10 to 25 seconds.

SPEED GAINS NOTHING

How much time does the man who drives at fifty save over the man who drives at the legal rate of forty? In the course of eight hours of driving he will only be about eighty miles ahead.

(Continued on page 23.)

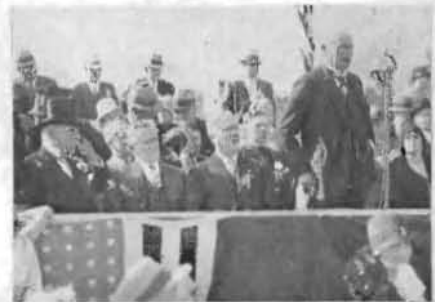
THE DEATH RECORD



The two thermometers pictured above show the danger of careless driving to the lives of the people of California. Highway fatalities in 1928 totaled 1876 persons. If the present highway fatality rate in California continues, 2050 persons will be killed this year in automotive accidents in this state.



*Scenes at the
Dedication
of the
Bay Shore Highway*



The Bayshore Highway Dedication

By COL. JOHN H. SKEGGS, District Engineer.

UNDER the auspices of the leaders of the state and the city of San Francisco, the last great natural barrier to free communication between the northern and southern parts of the peninsula, was formally declared abolished with the dedication of the Bayshore Highway, on October 20, 1929.



JOHN H. SKEGGS.

At impressive ceremonies directed by Supervisor Frank R. Havenner of San Francisco, the Governor of the state, C. C. Young, followed by Congressman Richard J. Welch, City Engineer M. M. O'Shaughnessy, State Director of Public Works, B. B. Meek, Sylvester J. McAttee, representative of civic bodies active in the promotion of the highway,

and Mayor James Rolph, commended the work accomplished and urged the early completion of a southerly extension to San Jose.

EARLY HISTORY

Since early days, San Francisco, because of the topography, has had to content herself with two woefully inadequate vehicular outlets to the south; on all other sides, deep water both hampered and promoted her development. Of these two roads, the central one, known as El Camino Real or the Peninsula Highway, now Route 2 of the state highway, had the greater share of the traffic on account of its geographic position with respect to the traffic arteries of the older towns, and its better grades and alignment.

The other road, northerly of its junction with El Camino Real, at a point about 11 miles south of the center of the city, followed

the bay shore, alternately dipping far inland to avoid marshy ground, and then equally as far bayward to swing around rocky headlands. The construction of the Southern Pacific Railroad bay shore cutoff in 1906 changed the location of the then existing road considerably, but still on narrow right of way and roadbed, on inferior alignment and grades, but worst of all, dumped the traffic into San Francisco on ill paved, narrow streets, hard to find, twisting and bending their way nowhere in particular. Small wonder that in those days it afforded little relief for the swelling traffic on El Camino Real, where congestion had long reached an intolerable stage the entire length of the road from San Francisco to San Jose.

The answer to the imperious demands of the traffic was soon discovered by civic leaders and engineers of the city and state, and consisted of two parts, first: the widening and improvement of El Camino Real, which was undertaken forthwith; second: a new, broad highway from near the center of the city to San Jose, located as far east as practicable, of the central highways and the towns strung like beads along it.

The agitation for the construction of the new highway came to a head in the 1923 legislature, when a statute was passed creating the Bayshore Highway and a later act in 1925 established this route as an integral part of the state highway system, extending from Army and Potrero streets in the heart of San Francisco to the city of San Jose.

CONSTRUCTION COMMENCES

It is one thing to establish a highway on paper by legal enactment; it is quite another to establish it on the ground without funds, and the project might have languished for some time, if the city of San Francisco had not stepped into the breach with a contribution of \$500,000, thus enabling the construction of 5.2 miles, the first unit from South San Francisco to Burlingame in 1924 and 1925.

This section of the highway is located across marsh and tidelands and involved many engineering difficulties. It was for rough grading only and completion of the contract was of small use to the traffic on account of the difficulty of finding the two ends and crossing the main tracks of the Southern Pacific at grade.

Views on the opposite page show the spectacle in San Francisco when the Bayshore Highway was dedicated on October 20, 1929. The upper view shows the crowd in attendance. Below is a view of the parade and a picture of a section of the highway. The other three pictures show Governor C. C. Young, M. M. O'Shaughnessy, City Engineer of San Francisco, and B. B. Meek, Director of the Department of Public Works (lower left hand picture) addressing the crowd who attended the dedication ceremonies.

This work was immediately followed by the construction of the great South San Francisco underpass at a cost of approximately \$275,000 and the surfacing of the section above described in 1928. At the same time a southerly extension 3 miles in length from Burlingame to San Mateo was constructed and with the improvement of laterals the road, for the first time, was of real relief to the former main highway down the peninsula. Before this road could come into its own, however, there remained the 3.1 miles section within San Francisco city limits and the 3½ miles section from the city limits to South San Francisco to be financed and improved.

FILLING THE GAP

This work, in both instances, involved construction of the heaviest character and on a scale never before undertaken by either the city or the state. The city's share of the work, 3.1 miles in length, cost over \$2,000,000 a large share of the cost being for new right of way and the moving, reconstructing or buying outright of over one hundred buildings. The right of way on this section is not less than 125 feet wide, with additional width to take care of slopes where necessary. Small attention was paid to existing streets and much of the right of way is through new territory. A paved roadway 100 feet wide has been constructed throughout, and for the greater part of the distance sidewalks have been installed 12½ feet wide on each side of the roadway. The standard type of pavement is 8 inches of plain concrete with a surfacing of 3 inches of asphaltic concrete. Fill sections where settlement may be expected have been given a temporary surface. The standard pavement is noteworthy for its enormous carrying capacity and the care that was taken in its construction to produce the highest strength of Portland cement concrete and the highest stability for the asphaltic concrete.

A pleasing feature of this section is the almost total absence of pole lines and unsightly street constructions of all kinds. Three pedestrian subways are constructed under the road to take care of the most dangerous pedestrian crossings.

At approximately the same time that the city commenced work on its section, the state awarded a contract for the 3½ miles south of the city, and throughout the construction period there was a friendly rivalry between the engineers and the contractors on the two sections to be the first at the finish. The actual finish was practically a dead heat. Both sections were in fine shape for the formal opening.

This state highway was designed on standards higher than heretofore attempted, providing a minimum right of way width of 125 feet throughout; a maximum grade of 4 per cent and curvatures not exceeding 1500 feet except at one point over the Southern Pacific's Sierra Point tunnel, where a radius of 750 feet was used. Because of the enormous cut involved, even on this radius, over 400,000 cubic yards of material were moved and due to landslides the end is not yet in sight.

The first three-fourths of a mile south of San Francisco was graded full width, gradually narrowing into a minimum of a 60-foot roadway in cuts. The typical section of roadway on fills also provided for a 60-foot roadway. However, due to the great volume of slides many of the fills are also full width.

A 2-foot bituminous macadam surface on an 8-inch waterbound macadam base 40 feet in width was placed the length of the project. This will later be replaced with permanent surfacing when the fills have reached their full settlement and when funds are available.

CONSTRUCTION FEATURES

Extraordinary difficulties were encountered during construction, hemmed in as this road is by the Southern Pacific Railroad on one side and the 44-inch Spring Valley Water main supplying San Francisco's downtown and industrial district on the other. This pipe line has been moved at many places to clear the new right of way. This operation was difficult and expensive totaling in cost approximately \$150,000.

A massive rubble retaining wall over 300 feet in length, 24 feet in height above grade and an equal amount below grade had to be constructed across the face of an old slide area to hold the pipe line above the highway and prevent the slide from overrunning the road. The construction of this wall was a race between rainy weather and all the equipment and men that the contractor could throw into the limited working space.

Under the pressure of the great sliding mass 12-inch by 12-inch cross-bracing crumbled like matches and still there was no foundation in sight. Anxiety for the safety of the large force of men engaged in hand work 25 feet below the surface was constant and a great sigh of relief went up when it was finally determined that suitable foundation had been reached.

In the meantime slide movements had taken place under the trestle supporting the Spring Valley pipe above and some distance back of the wall and it was deemed expedient by the water company and the district office that

(Continued on page 26.)

Heavy Work on Southern Roads

ALL SUMMER traffic has been enjoying the use of the new highway to the San Bernardino mountains. This road has long been known as the Rim of the World Highway or the Crest Drive. Early in the spring a grading contract six miles long was completed and thrown open to the public, making the climb into the mountains possible on high gear. During the spring and summer months the road has been oiled and has now a fine hard surface.

Throngs of motorists from the Los Angeles metropolitan district use this road every week end. Since the completion of the new link this traffic has greatly increased. The oiling of the road and elimination of dust has made the trip into the mountains a pleasure. The old road had grades as steep as 22 per cent and was dusty and disagreeable.

EASTERN travelers entering southern California via the Old Trails Highway and southern California travelers to the Grand Canyon and Zion Park regions, all go through the Cajon Pass.

The upper part of the old Cajon Pass road has long been a source of anxiety and danger to travelers. The combination of narrow road, many sharp turns and the great chasm below has resulted in many serious accidents in past years.

An entirely new road is now well toward completion, eliminating the worst part of the



The loop around "Panorama Point." This point will be beautified with forest trees.



A cut and fill on Cajon Pass.

present road. The map shows the new road, compared with the present road.

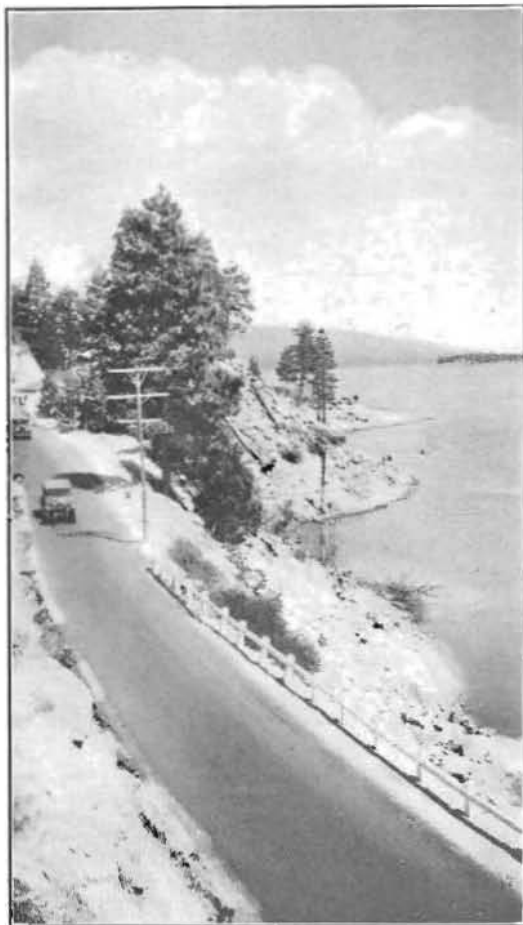
In order to construct a new road on modern standards in this rough country, it is necessary to make great cuts and fills. This has resulted in the very heavy construction seen in the photographs.

The San Bernardino *Sun* describes the project as follows:

VICTORVILLE, Oct. 3.—Mountains are being moved along the westerly side of Cajon Pass in the reconstruction work being done on the National Old Trails. The work is of such a stupendous nature that the topography of the pass will show a material transformation. Few people conceived the magnitude of

the project until they saw the mountain crest moved away and deep, wide cuts made huge fills in the canyons below the new road.

The contractors have progressed with the construction work until it is possible to get an adequate conception of the new highway curves for more than three miles through the pass. The new road will be safe as compared with the present route with its many



View of the completed oiled surface on the edge of Big Bear Lake.

acute curves. The scenic outlook will be as entertaining as from the present road, and the occupants of an automobile may enjoy it without fear of meeting some wild driver trying to take all of the roadway on a sharp turn.

SCENIC CHARM TO BE RETAINED

Those who have traveled day after day through the Cajon Pass may have become so accustomed to it as to fail in appreciation of its charm, but those who traverse the region for the first time are delighted with its peculiar beauty and ever changing phases of interest.

The contractors hope to have the new section of the highway complete and ready for travel in January or February unless the early part of the winter is unusually wet.

Secretary Hyde Offers 3 Definite Suggestions for Billboard Curb

ARTHUR M. HYDE, secretary of the U. S. Department of Agriculture has addressed a letter to Ralph W. Bull, chairman of the California Highway Commission, containing three suggestions for the betterment of billboard conditions along highways. Mr. Hyde's letter is as follows:

DEPARTMENT OF AGRICULTURE

Washington, D. C.

October 22, 1929.

Mr. Ralph W. Bull, Chairman,
California Highway Commission,
Sacramento, California.

Dear Mr. Bull:

In a communication from the Outdoor Advertising Association of America I recently received three concrete suggestions for the improvement of conditions in regard to highway advertising signs. I am transmitting these suggestions, which are:

1. Participation by engineers of the Bureau of Public Roads in the selection of scenic sections where objectionable roadside conditions should be immediately remedied, and in the allied activities of the association's state organization.

2. Reports from the highway engineers to the Committee on Public Relations of the Outdoor Advertising Association of America, 2 Park Avenue, New York City, on specific structures and locations which are traffic hazards, which obscure the view of highway markers, or which are otherwise objectionable. Prompt action will follow.

3. Similar cooperation on the part of all members of the American Association of State Highway Officials in their respective states.

I have of course no intention or desire either to add to the burdens of highway officials or to influence their action further than such merit as these suggestions may have, would naturally imply. You are invited to communicate these suggestions to such members of your force as would be interested, leaving to them such action as they may care to take in connection with conditions which they may feel to be objectionable.

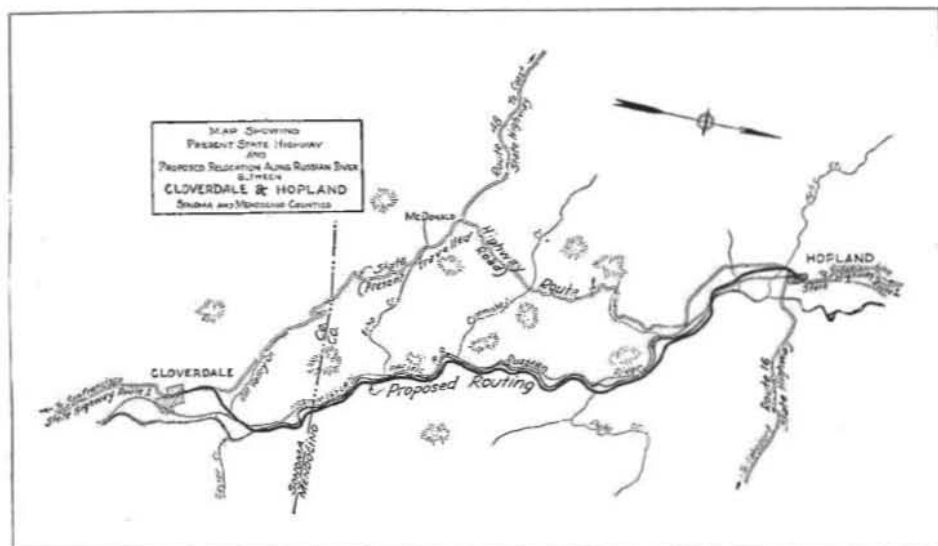
Sincerely,

(Signed) Arthur M. Hyde,
Secretary.

There are 56 sharp curves on the present traveled road, many of which can not be traveled safely at more than 15 miles per hour. On the new road there will be 11 easy curves, all of which can safely be traveled at full legal speed limit.

IOWA—Rural speed limit on vehicles weighing less than three tons has been removed.

Redwood Highway Section Relocated



THE RELOCATION of the section of the Redwood Highway between Cloverdale and Hopland to follow the Russian River in place of the present location over the mountains has been approved by the California Highway Commission following a recommendation to this effect made by the Division of Highways. The decision is subject only to approval by Attorney General Webb as to certain legal questions involved in the transfer of the highway to a new location.

The decision was based upon a careful study of all possible routes for this section of the highway. The river route showed the following decided advantages:

It is approximately three miles shorter than the present mountain route and a mile shorter than the next best alternative route.

Grade and alignment on the river route are excellent, making fast, safe and economic service possible under all conditions.

A large amount will be saved in initial reconstruction costs.

Saving in investment, reduction in distance and elimination of grades produce a capitalized value in favor of the route amounting to \$960,000 immediately and \$1,680,000 in five years when traffic will double.

It will be a scenic river route with camp sites available.

It will readily respond to future widening.

It is the only practicable method of eliminating maximum grades that will aggregate eight miles in length by way of the alternative mountain route. On the latter some sharp curvature is also unavoidable.

The possibility of serious slide conditions on this route were carefully studied by engineers of the Department of Public Works. This same situation was also considered by Dr. George E. Ladd, geologist for the U. S. Bureau of Public Roads. All agreed upon the practicability of constructing the river route.

Authority has been granted to State Highway Engineer C. H. Purcell, to make a standard survey of the river route to definitely determine the details of location and the cost of construction. As no provision for building this section was included in the 1929-1931 budget, actual construction will not be possible during this biennium.

During an extremely cold spell in the Puget Sound country, something gummed the works of a thermometer hung outside the Chamber of Commerce building and the worst it could do was seventy-two above.

Along came a man, bundled up to his ears, but still shivering. For a moment he gazed at the thermometer, then turned away in disgust, saying: "Ain't that just like the Chamber of Commerce, anyway?"

How California Plans its Hospitals

By CARL E. BERG, Engineer of Estimates and Cost, Division of Architecture

A LARGE PART of the work of the Division of Architecture is in connection with the state hospitals of which there are eight at present, namely: Agnew, Mendocino, Napa, Norwalk, Patton, Stockton, Pacific Colony and Sonoma, with a ninth to be started in the southern part of the state in 1930.



CARL E. BERG.

Each one of these hospitals is really a small community or town in itself and some of the larger hospitals have, counting inmates and employees, more than 3500 people within their borders, for whom must be provided all the comforts of modern civilization.

The following short description of a few of the more important buildings and list of other structures, etc., making up the modern state hospital, with a capacity of approximately 3000 patients will give an idea of the work to be performed by the architect and the engineer in its planning, construction and maintenance, and the investment the state must make in buildings, plants, equipment and land.

THE RECEIVING BUILDING

The first building the patient enters is the so-called Receiving Building. This building, generally a two-story fireproof structure, is a hospital and ward building combined, and in most instances contains special rooms for treatment, such as hydrotherapy, light bath and continuous bath. In this building the patient is kept for observation and treatment for varied periods of time.

For a large institution, this building will have accommodations for approximately 175 patients and its cost will probably be \$225,000, fully equipped.

A TYPICAL WARD BUILDING

From the Receiving Building the patients are distributed to the various wards according to the classification given them. As

already stated, the different wards vary somewhat in their design according to the class of patients they accommodate, and they are either one- or two-story structures, housing from 40 to 120 patients each, either in large dormitories or in individual rooms. A typical ward building will have dining room, with serving kitchen, large living rooms, clothes and shoe rooms, toilet, wash and bath rooms, dormitories and single rooms for the patients, and, as a rule, a few rooms with bathrooms attached for the use of the attendants in charge.

The cost of the different ward buildings will, of course, vary somewhat, but for a large hospital, will average slightly more than \$700 per patient, including the cost of furnishings.

INDUSTRIAL BUILDINGS

To keep the patients occupied, the hospital employs as many as possible in the work necessary for the running and upkeep of both the main institution and the farm, and in addition several shops or industrial buildings are provided, where, under proper supervision, the patients are given healthful occupation, such as rug weaving, toy making, embroidering, reed furniture making, etc.

These industrial buildings are generally two-story fireproof buildings and cost approximately \$35,000 each, with equipment.

HOSPITAL RECREATION

For the patient's recreation, the modern hospital provides one or more assembly halls or auditoriums where movies and plays are given several times a week, and where Divine service is conducted on Sundays. Such an assembly hall was recently completed at the Norwalk State Hospital at a cost of \$75,000, including equipment.

THE HOSPITAL KITCHEN

One of the most important buildings, especially from the patient's and average employees' standpoint, is the kitchen. Great strides have been made in recent years in its improvement.

A kitchen of the latest design is now under construction at Patton State Hospital, containing in addition, a bakery, large cold storage plant and dining rooms for both employees and patients. These dining rooms are arranged on the cafeteria plan, an innovation

introduced into the California Institutions by the present Director of Institutions, Mr. Earl E. Jensen, and which will effect considerable saving in food. The cost of this kitchen, including equipment and bake oven, will be approximately \$150,000.

To house the employees in the way now planned, requires a large sum and for an institution with a capacity of approximately 3000 patients will probably run \$450,000. To this should be added the cost of an employees' club room, estimated at \$65,000.

An Administration Building will cost around \$60,000 and a phone system, approximately \$5,000.

The Commissary, Store and Warehouse, will probably cost \$40,000.

THE COMPLETE PLANT

The above named are only a few of the structures required by the modern hospital, a complete list would include buildings listed as follows: Receiving Building, wards for 3000 patients, two industrial buildings, assembly hall, kitchen and dining hall, employees' quarters, employees' club room, administration building, phone system, Commissary and warehouse, powerhouse, stack and shops, boilers and powerhouse equipment, cold storage and ice plant, laundry, cannery, service connections, steam, gas, electric and sewer, water system, including wells, pumps and storage, sewage disposal plant, farm buildings, etc., miscellaneous structures, roads.

GROUNDS AND FARM

For the main institution, not less than 125 acres should be allowed, in order that the buildings may not be in too close proximity, and to allow adequate landscaping of the grounds. At a conservative valuation, this land will cost not less than \$200 per acre.

The farm, which is an almost necessary adjunct to a state hospital, in that it furnishes healthy outdoor work for the patients and provides at small cost, both vegetables and fruits, dairy products, eggs, poultry and fresh meats, etc., generally comprises not less than 1000 acres of land.

PRESENT HOSPITAL POPULATION

The present inmate population of the eight state hospitals is 16,883, and it is expected that by 1939 this population will reach 22,300, an increase of nearly 33 per cent in the next ten years. Merely to plan and construct sufficient buildings, etc., to take care of this increase will involve a large amount of work on the part of the Division of Architecture.

However, in addition to this, the inmate

capacity of practically all the state hospitals today is less than the present needs, causing overcrowding and making proper segregation difficult; also making it impossible for the hospitals to accept commitment of many who should be admitted and, to correct this condition, many additional buildings will have to be constructed.

Furthermore, the provision of proper quarters for the employees at the hospitals has, in the past, been neglected to a great extent, resulting in a large labor turnover, with consequent difficulty in administration. In order to remedy this condition, a much larger construction program must now be carried out than would have been required, had suitable employees' quarters been provided in the past, as needed.

CHANGES IN HOSPITAL PLANNING

There has also been a decided change in the attitude toward and treatment of the insane and mentally affected, and, naturally, this change has influenced the planning and construction of the state hospitals.

The large three- and four-story barrack-like structures of the last century are rapidly giving way to smaller one- and two-story buildings housing from 40 to 120 patients each, so that the different types may be segregated and each type have quarters especially designed and equipped to give the maximum comfort to that type. For instance, there are now under construction or have recently been constructed, buildings designed especially for tubercular patients, patients able to work, the old and infirm, the untidy, the very disturbed, etc.

This naturally means that many additional buildings must be provided to replace old and obsolete structures and also to replace many temporary buildings built from time to time when the need absolutely required it and money for a permanent structure could not be obtained.

THE TEN-YEAR PROGRAM

From the above it is evident that the work of the Division of Architecture in planning and constructing for the state hospitals is going to be considerably increased; fortunately, a great help was given, not alone to the Division of Architecture, but also to all state agencies and state offices concerned with any or all of the state institutions, when Governor C. C. Young, in the early part of his administration, requested the Director of Public Works to have prepared a tentative building construction program to cover the next ten years. This program, the so-called

(Continued on page 26.)

Highway Work
Praised by Chamber
of Commerce

Carmel Claims First
"Scenic Reserve"

Steam Shovel Un-
covers Indian Village

Who Has Right to
Right of Way?

Clippings, Letters and Comment



Dealing With State Highways

Colonel Marshall
Talks to New York

Unusual Shade Trees
in California

Widening Work
Wins Commendation

Wasco Likes High-
way Striping

Highway Work Praised by Chamber of Commerce.

The following letter from the San Bernardino Chamber of Commerce written under date of October 11, 1929, has been received by the California Highway Commission:

San Bernardino, California,
October 11, 1929.

California State Highway Commission,
Sacramento, California.

Gentlemen:

The Board of Directors of the San Bernardino Chamber of Commerce has watched with particular interest the work being done by the California State Highway Commission, not only in this county, but throughout the state. It is apparent to the most casual observer that this is a real program of work and that the highways are being improved with some definite idea of continuity and final completion. This is a very pleasing and satisfactory situation.

It may not be amiss—occasionally at least—to advise men in public office who are trying to serve that their efforts are appreciated. Unselfish public service from public officials is accepted as a matter of course, but when the work being done by any branch of our state officials is so distinct in its accomplishment, the Board of Directors of the San Bernardino Chamber of Commerce feel that it calls for a particular expression of commendation.

Therefore, at the regular session of the Board of Directors of the San Bernardino Chamber of Commerce held this date, the president and secretary were instructed to draft this letter, adding thereto the statement that we believe that under the direction of Mr. B. B. Meek, the work on the state highways is being carried forward in an efficient manner, and that we feel we are fortunate in having his services in the position he now occupies.

Of special importance to the people of San Bernardino is the program of work on state highways now being carried on in this county, and it is evident that every consideration possible is being given to the improvement of the highways in this county and the ultimate completion of the final links in this county.

The people of San Bernardino city and of the county as a whole are also highly appreciative of the services of Mr. E. Q. Sullivan, who is in charge of this division. Mr. Sullivan is held in the very highest

esteem by our citizens, and we know that he gives his best attention to the work on hand and results are being accomplished.

Trusting that the foregoing will be considered in the spirit in which it is given, and that this Chamber of Commerce may have opportunity at some time to have the Highway Commission, its engineers, and Mr. B. B. Meek as our guests should occasion bring them to San Bernardino, we are

Yours very truly,

SAN BERNARDINO CHAMBER OF COMMERCE,
R. D. McCook, President.
R. H. Mack, Secretary.

Carmel Claims First "Scenic Reserve."

First honors are claimed for Carmel in the following article taken from the October 11th issue of *The Pine Cone* of that place:

Another telling shot has been fired in the fight to maintain the scenic beauty of California highways—to keep them free from the nuisance that may be summed up under the heading of "hot dog stands."

It is a shot of more than passing interest to Carmel, for it concerns the Carmel Valley Highway. This 16-mile stretch of highway is the first of a state-wide chain of scenic reserves to protect the natural beauty along California's highways.

Establishment of the first of these reserves in the Carmel Valley is announced in the latest bulletin released by the California State Chamber of Commerce.

Property owners along the Carmel Valley road, a 16-mile highway in the Monterey Bay area, have signed pledges that advertising signs will not be allowed upon their lands, according to the bulletin.

Unusual Trees Shade the Way in California.

The *Christian Science Monitor* of October 9th carried the following article:

HUNTINGTON PARK—The love of trees and their preservation has provided W. E. Ford, Commissioner of Streets in this city, with an opportunity of bringing verdure and beauty to an industrial

district, in the planting of more than 9000 trees since the incorporation of Huntington Park in 1908, when the city was named for the late Henry Huntington.

Twenty years ago this city was a small hamlet, and a portion of the old Cudahy Ranch. Many of the fine old trees from the walnut and orange orchards were preserved by Mr. Ford at that time until it became necessary to transplant for parks and streets with the progress of the community and the entrance of industrial concerns.

Mr. Ford, who then received his appointment of street commissioner began at once a study of trees and their adaptability to the soil of southern California. He made his selections carefully.

For the trees which must weather all sorts of conditions, especially the hot sun of this climate, providing shade for the wayfarer, he selected black acacia and the Australian umbrella because of the toughness of their roots. Fifteen hundred acacias were planted in one year.

Along the streets the "bottle" tree, a native of Australia known as the *stereocia*, were used. Much like the maples of the east, in appearance, the "bottle" tree's roots are "tapped" and will hold the moisture longer than any other tree, offering a good shade tree for southern California.

In the parks, Mr. Ford planted palms, Arizona ash, cedars, and Norway pine for beauty of sky line and shade. For color late in the autumn he planted dahlia trees that bloom only in November, scattering lavender blossoms and a faint fragrance all during the month as the rains begin.

Two old palms which once flourished on the Cudahy ranch were successfully removed 20 years ago and transplanted to the city hall park. Owing to the special care which Mr. Ford gave the little tendrils of the palm which make it one of the most difficult of trees to transplant, the two trees are vigorous and wide spreading today.

* * * * *

Widening Work Wins Commendations.

This from the *Santa Cruz News* of October 3d:

The State Highway Commission is obliged, for want of funds, to carry on further this winter the widening of the highway from Santa Cruz to Los Gatos. The Commission has certainly done splendid work in this direction thus far, and the public is appreciative of benefits received.

* * * * *

Wasco Likes Highway Striping.

The *Wasco News* of October 11th has the following to say:

The State Highway Commission will get a letter of commendation from the Wasco Exchange Club regarding the white line painted down the center of the highway from Famosa south. This action is being taken at the suggestion of C. A. Campbell, who said that the line was very helpful to night drivers.

Many members of the club agreed that this was the case. Ray Woollomes, supervisor, stated that he understood that the Highway Commission planned to paint a white line 12 inches from the shoulders of the paving too, with the object of keeping people away from the edge, and thus saving the highway.

Who Has Right to Right of Way?

Motorists who are finicky about the right of way at intersections and are inclined to "bawl out" the other driver are invited to read the latest decision of the Supreme Court in Washington on a case involving this point. The court decided that the right or preference at a crossing does not arise except when drivers are approaching at the same time and approximately the same speed. Then the one on the right has the right of way. It is no excuse to say that trees obscured the way, for this should only increase the vigilance. When a driver approaches a street intersection, and sees another approaching from his right, and near enough so that there is reasonable danger of collision if both proceed, then it is his duty to yield the right of way.

* * * * *

"Squaw Rock" Scenic Feature of New Sector.

This is from the *Redwood Journal* of Ukiah:

The favoring of the east side of the Russian River road instead of the present Cloverdale-Hopland grade promises to bring to tourists a "million dollars worth of scenery" within a few miles.

Among the high lights of scenery along the east side road is "Squaw Rock," a natural masterpiece in rock which has been encircled with a halo of mystery for years through Indian legend.

According to Indian legend, "Squaw Rock," a huge stone precipice marked by the hand of Nature with a roughly hewn stone semblance of a human countenance, was about a hundred years ago the haunt of a mysterious Indian woman—blonde, and almost an enchantress.

In the story told by remaining members of the disappearing race, the blonde Indian woman enticed Indians to their death on this rock. A cave, said to be her home, still is pointed out near the rock.

Finally, legend says, she enticed away the son of an Indian chief, and vengeful members of the tribe drove her to her doom over the towering rocks.

Therein, it is said, lies the foundation of the name "Squaw Rock," one of the old west's legend-enshrined bits of natural scenery.

* * * * *

Anti-Abbreviation Poem Was Itself Abbreviated.

It appears that the newspaper clipping reprinted in the October number of CALIFORNIA HIGHWAYS AND PUBLIC WORKS, urging that California be written in full and not abbreviated, failed to carry the last six lines of this poetic request for the proper spelling of the state's name. Mrs. Al Utter of Ukiah, author of the poetic appeal referred to, has sent CALIFORNIA HIGHWAYS AND PUBLIC WORKS a complete and authentic copy of her

poem. The concluding lines which did not appear in the clipping previously published, are as follows:

So write! Don't be lazy! This state gives one pep,
The least one can do in return is get hep
And don't cut her name down to "Cal" or "Calif."
Makes one think you might feel as though or as if
Should you write the full name some nit-wit might
scorn you;
Such a fine-looking word, too! So CALIFORNIA!

Secondary Highway Study Commended.

Under the heading "Progress of State Highway Work," the Redlands *Facts* editorializes as follows:

Possibly no other public enterprise looms larger in the minds of most of us than that directed toward completing our great highway system. Good roads certainly help to bring prosperity and to the construction of an adequate system, the state is committed.

At the last session of the legislature it was ordered that the Department of Public Works carry on some studies as to highways not now included in either the primary or secondary systems previously approved, with the thought in mind of later placing these roads into the latter category. Director Meek of the Department now reports the progress he is making with this work, and it appears that his Department is using due diligence in prosecuting the work.

The method of procedure has been a careful field reconnaissance with the aid of all available maps, topographical sheets, traversing the country between the designated termini, to compare all possible routes; estimates which are made up in considerable detail to cover the cost of grading mile per mile, individual bridges of any size, cost of right of way for each mile, and the cost of grading, paving and temporary surfacing where necessary.

A traffic survey in connection with the roads being studied has been going on continuously. Two density counts have been made for the entire system of stations, and the special crew which has been engaged continuously on the information count has completed two rounds of the information stations selected.

Talk Across Nation Without Their Voices.

This from the Napa *Register*.

Recently, two men, each equipped with an artificial larynx, engaged in a transcontinental telephone conversation.

Col. R. B. Marshall, state highway employee of Sacramento, who lost his voice through sickness two years ago, talked over 3000 miles of telephone wire to Sergius P. Grace, Assistant Vice President of the Bell Telephone Laboratories in New York. Although Grace has normal speech, he also used one of the larynxes.

Marshall thanked Grace for the gift of the larynx, a recent invention of the laboratories, which Grace promised the speechless Californian while on a trip to San Francisco last April.

Steam Shovel Uncovers Ancient Indian Village.

Frank A. Gehring, writing in the San Luis Obispo *Telegram*, tells the following interesting story:

Evidences of an early day tragedy which wiped out an ancient Indian village, were uncovered recently by a steam shovel on the San Simeon-Carmel Highway.

In making a deep cut, the shovel unearthed skeletons, tomahawks, stone mortars, and other relics of village life, and a 4-foot deep shell bed, indicating that the villagers were fishermen and had spent many years at the same spot, was uncovered. The village was on the coast, between Villa and Alder creeks.

The fact that the village had been unearthed was not discovered at once, as the material dug up was dropped down the mountain side, and it was not until some skeletons were found on the dump, that the existence of the old village was known.

According to H. L. Leventon, superintendent in charge of the highway construction, and who told of the find to Lester H. Gibson, division engineer of the State Highway Commission, the fact that all the skeletons found were in a prone position, indicating that the place dug up was a village, covered up by a landslide, and not an Indian burial spot.

It was customary for the Indians on the coast to bury their dead with their knees drawn up under their chins, and the fact that none of the skeletons found were in this position, Mr. Leventon believes, indicated that a village was covered by the falling earth from the higher hills.

The 4 foot thick bed of shells showed that the village was of considerable extent and that it has been in the same place for many years, else so deep an accumulation of shells could not have developed.

That the village was of ancient origin was indicated by the fact that nothing of a metal nature was found in the objects uncovered, and the tomahawk heads uncovered were all of chipped stone, while the wooden handles had disintegrated with time.

On one of the tomahawk heads, however, shreds of the buckskin thong which bound it to the grip, still remained.

One of the queerest of the finds was a skeleton with the skull covered by a rounded out stone mortar, such as the Indians used for grinding grain.

Whether the mortar rolled into the position during the landslide, or was placed there for some unknown purpose, was one of the mysteries of the discovery.

Besides several tomahawk heads, there were numbers of stone arrowheads, stone mortars and pestles and other relics of Indian village life. There was no pottery of any kind, however, and this was another reason for Mr. Leventon's opinion that the village was an exceedingly ancient one.

Descriptions of all the materials found were sent by Mr. Leventon to the department of ethnology, at the University of California, for possible identification, and the relics are being kept by him for further examination and study by officials of the state institution.

This from a boy:

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

MEASURING THE WATER CROP IN CALIFORNIA'S SNOW FIELDS

(Continued from page 2.)

sentative courses. In general the site of a snow course must be one where the snow will lie uniformly and where ground irregularities are a minimum. Usually a sheltered flat or meadow furnishes the best location. It should be of sufficient size that a fairly long "major" course and possibly a "minor" course at approximately right angles may be laid out. With courses 500 feet long or less the measurements of snow depth and water content are made at 25-foot intervals. With longer courses the interval may be 50 or 100 feet. Each course is accurately located at the angle points and ends by suitable markers placed above maximum snow depth so that on each survey the measurements will be taken at identical points as determined by tape measurements from the same initial point.

EQUIPMENT

The essential equipment in the determination of snow depth and water content at the points along the courses comprises a light jointed steel sampling tube equipped with a serrated annular cutting bit, and a scale. The tubes are made up in 5-foot sections for convenience in transportation. Narrow slots cut in the walls of the tubing provides windows through which to observe the column of snow within and through which to insert a tool for cleaning out the snow. The outside of the tubes is graduated to read in inches. The scale may be supported on the skii staff and when a core of snow has been obtained with the tube the tube and snow are weighed together by placing the tube in the supporting cradle suspended from the scale. Previously the scale pointer is set to zero with the empty tube only in the cradle, so that when the core is weighed the scale shows its weight only.

The various agencies doing snow surveying work are using many modifications of the sampling equipment as above described but there is a certain standard equipment as developed by Dr. Church and the Nevada Cooperative Survey known as the "Mount Rose Snow Sampler" which is manufactured and listed by certain instrument makers. In the California work the Mount Rose sampler has been adopted with certain minor modifications. The cutting edge on the tube of this sampler is exactly 1.5 inches in diameter and the spring scales with light aluminum case

are so calibrated that with this diameter of cutting edge the weight of core is given directly in inches of water.

PROGRAM OF WORK

As to the program for the work as now being developed, it has been stated that the scope contemplates the correlation and standardization of all work being done by present agencies and as great an extension to the unsurveyed territory as may be possible with funds available. As a working basis a skeleton selection of crest, intermediate and low level snow courses for each major stream basin in the Sierra has been adopted. With the funds available the state itself can not develop an organization to make the actual surveys. It can furnish the standard equipment and forms and provide the necessary supervision to coordinate all work. It can also share to some extent in the costs of the surveys, the construction of shelter cabins, and stocking of them with provisions, bedding, etc. The personnel and detail arrangements for and conduct of the surveys can, however, only be economically handled through cooperative arrangements with the agencies most interested in a particular stream basin.

In the contacts that have been made to date with the agencies now doing snow survey work the earnest desire to cooperate and the expressed willingness to make such changes as may be necessary to conform to "standard practice," have been most gratifying. As an example of the cooperative arrangements, the agency may have been taking only scattered single point snow depth observations over a certain portion of a stream basin. The state now asks that this work be expanded by including certain snow courses where the water content will be measured, and selects the courses. With little additional work it may also be feasible to extend the survey route to include a much needed course just over the crest in another watershed.

PHYSICAL PROBLEMS MOST DIFFICULT

In the extension of the work to fill in the gaps and supplement the present surveys the problems are not simple. Where the snow cover-runoff relation is confined to the upper basins and high altitudes the physical difficulties are of course considerable but those attendant upon the interpretation of data and analysis are comparatively slight. Coming to the lower elevations, however, and attempting to forecast run-off at foothill and valley points, the zone of early melting snow and precipitation as rain is encountered and the difficulties increase. It goes without say-

ing that the snow survey must be definitely tied in with the many precipitation stations of the U. S. Weather Bureau at the lower elevations if proper forecasts for the lower points are to be made. The state will also supplement the U. S. Weather Bureau stations by establishing precipitation stations at many locations in and adjacent to the national forests where there are permanent residents.

There are many modifying factors which must be taken into account in forecasting the run-off at a certain point from a given snow cover. The temperatures prior to and during the snowfall period as well as during the run-off period are an important consideration. Wind velocity and direction, evaporation, humidity, and soil conditions are other factors not to be neglected. To provide information as to such factors it is planned to establish certain "key" stations for the observation of fairly complete meteorological data, and in addition, a number of thermographs at strategic points.

The plans call for one complete survey at all courses about April 1st of each year for the preparation of the main forecast bulletin as of about that date. At selected stations, however, the survey will be conducted monthly or at frequent intervals to furnish data for supplementary forecasts prior and subsequent to the main forecast. Obviously, for some time, definite forecasts will only be possible for those basins or partial basins where the data from surveys conducted previous to the present time are available for purposes of comparison. Except for such locations, therefore, and until "normals" or data for yearly comparisons are developed, the bulletins can supply only the actual measurements of the surveys. With an unbroken continuation of the work for a period of years, however, it appears reasonable to anticipate valuable forecasts, not alone of the total seasonal run-off but of the monthly or periodic distribution of run-off.

The California cooperative snow survey is an activity coming under Harold Conkling, deputy in charge of water rights of the Division of Water Resources, Department of Public Works. The writer is directing the work and Spencer M. Munson has immediate charge as assistant.

LOCATION OF SNOW COURSES

The following statement shows in detail the location of snow courses, proposed, established or now surveyed, and gives the agencies cooperating in this work. Key courses are those where arrangements have been made or are proposed for surveys once a month from January to May.

Pit River

On this stream basin Mt. Lassen will be a key course with surveys made once a month, January to

May. Snow survey courses have just been established at the following places: Cedar Pass (5500 feet); Eagle Peak (7500 feet); Adin Mountains (6500 feet); Snow Mountain (5500 feet). A snow survey course is also proposed for Grizzly Peak. The surveys on the upper Pit Basin are to be made by I. M. Ingerson, in charge of the Pit River investigation of the Division of Water Resources. The Snow Mountain and Mt. Lassen courses will be surveyed through cooperation with the maintenance department of the Division of Highways.

McCloud River

Mt. Shasta is the key course for this stream basin. Snow courses are proposed for Black Fox Mountain and Mt. Hoffman.

Upper Sacramento River

Mt. Shasta is the key course and an additional snow course is proposed for China Mountain.

Feather River

The snow surveys on this stream will for the first year be confined chiefly to the North Fork with Mt. Lassen (8500 feet) and Haskins Flat (5300 feet) as key courses. There will also be a crest course proposed for Grizzly Mountains. Snow courses have just been established at Harkness Flat (6400 feet), Feather River Meadows (5000 feet), Chester Flat (4500 feet), Humbug Summit (5600 feet), Mt. Dyer (7400 feet), Fredonia Pass (6400 feet), Mt. Stover (5500 feet), Warner Creek (5000 feet), Mill Creek Flat (5800 feet), and Three Lakes (6100 feet). Snow courses are also proposed for Onion Valley, Gold Lake, Table Mountain and Cammel Peak. The Great Western Power Company is cooperating in the surveys on this stream basin, that lie in the vicinity of its Almanor and Bucks developments.

Yuba River

La Porte, Lake Fordyce and Summit will be the key courses on the Yuba watershed. Other courses have been surveyed in previous years at Webber Peak (8000 feet); Bowman Lake (5630 feet); English Mountain (7100 feet); Findley Peak (6500 feet); Lake Spaulding (4800 feet); Cisco (5700 feet); Furnace Flat (6600 feet); Sawmill Flat (7000 feet); Lake Sterling (7000 feet); Red Mountain (7200 feet) and Meadow Lake (7200 feet). Courses have just been established at Jackson Meadows (6200 feet) and Haypress Valley (6800 feet). A course is also proposed for Gold Lake Ridge. The La Porte course is also a new one. Cooperating agencies on this watershed are the Pacific Gas and Electric Company, The Nevada Irrigation District, and the Nevada Cooperative Surveys.

Truckee River

Key courses on this stream basin are Summit (7019 feet) and Mt. Rose (10,000 feet). Other courses already established are Truckee (5800 feet); Boca (5600 feet); Crystal Peak (770 feet); Big Meadows (8700 feet). These courses have been surveyed for many years. Cooperating agencies are the Pacific Gas and Electric Company and the Nevada Cooperative Surveys.

Lake Tahoe

Mt. Rose with an elevation of 10,000 feet is the key course on this stream basin. Other courses, all of which have been surveyed for many years are Marlette Lake (8000 feet); Daggetts Pass (7500 feet); Freel Peak (8300 feet); Lake Lucille (8700 feet); Rubicon Peak (8000 feet); Ward Creek (7000 feet); Tahoe City (6200 feet). A new course has been established at Myers (5400 feet). These surveys are conducted through the Nevada Cooperative Survey.

American River

Silver Lake (7300 feet) and Summit (7019 feet) have been selected as the key courses. Other courses that have been surveyed are Cisco (5700 feet); Ward Creek (7000 feet); and Lake Lucille (8700 feet). Courses just established are located at Sixmile Valley (5700 feet); and Carson Pass (8500 feet). Courses are also proposed for Duncan Peak, Gerle and Union Valley. Pacific Gas and Electric Company and the Nevada Cooperative Survey are cooperating agencies.

Carson River

Blue Lakes (8000 feet) is the key course. Other surveys will be conducted at Williams (7800 feet); Burnside Lake (8000 feet); Grovers Springs (6200 feet) and Silver Peak (8800 feet). These surveys are conducted through cooperation with the Pacific Gas and Electric Company and The Nevada Cooperative Surveys.

Mokelumne River

Blue Lakes (8000 feet) is the key course. Other surveys will be conducted at Pacific Valley (7500 feet) and Bear Valley Ridge (6700 feet). The Pacific Gas and Electric Company is the cooperating agency.

Stanislaus River

Niagara Flat (6500 feet), Strawberry Lake (5700 feet) and Lake Alpine (7500) feet have been designated as key courses. Courses just established are located as follows: Kennedy Meadows (7600 feet); Sonora Pass (9200 feet); Relief Dam (7300 feet); Pacific Valley (7500 feet). Proposed courses are Eagle Meadows, Bloods, Duck Lake and Clover Meadow. Cooperating agencies are The Nevada Cooperative Surveys and Pacific Gas and Electric Company. The Pacific Valley course is in the Mokelumne basin but is close to the Stanislaus divide.

Walker Pass

Courses have been surveyed for a number of years on this stream basin. The present work will be carried on in conjunction with the Nevada Cooperative Surveys. The courses follow: Sonora Pass (9200 feet); Pickle Meadow (7200 feet); Pickle-Leavitt Bench (7000 feet); Leavitt Meadow (7200 feet); Willow Flat (8300 feet); Buckeye Hot Springs (6900 feet); Buckeye Creek (8000 feet); Buckeye Forks (8500 feet); Center Mountain (9300 feet).

Tuolumne River

Strawberry Lake (5700 feet), Kibbe Ridge (6500 feet), White Wolf (8000 feet), and Tioga Pass (9000 feet) are the key courses on this stream basin. Other courses at which snow surveys will be conducted are Center Mountain (9300 feet); Dana Meadows (9700 feet) Dorothy Lake, Benson Lake, Wilmer Lake, Lyle Fork (8000 feet); Tuolumne Meadows (8600 feet); White Wolf (8000 feet); Fletcher Lake (10,300 feet); Beehive (6500 feet) Gin Flat (7100 feet). Cooperating in these surveys are The Nevada Cooperative Surveys, the Pacific Gas and Electric Company, Southern Sierra Power Company, Yosemite National Park, Turlock and Waterford Irrigation Districts, and the city of San Francisco.

Merced River

Snow Flat (8700 feet) and Merced Lake (7200 feet) are the key courses. Other courses are located at Gin Flat (7100 feet); White Wolf (8000 feet); Lake Tenaya (8100 feet); Fletcher Lake (10,300 feet); Isberg Pass (10,000 feet); Peregrine Meadow (7100 feet); Moraine Meadows (8700 feet); Wawona Point (6700 feet); Crescent Lake (8500 feet). Cooperating agencies are the Yosemite National Park and the Merced Irrigation district.

Mono Lake

Courses on this basin have been surveyed for a number of years. All courses except Davis Lake are surveyed monthly from January 1st. Courses are located as follows: Tioga Pass (9900 feet); Rhine-dollar Lake (9500 feet); Saddlebags Lake (10,000 feet); Sylvester Meadows (7500 feet); Davis Lake (10,000 feet); Gem Lake (9200 feet); Silver Lake (7300 feet); Grant Lake (7200 feet). The Southern Sierra Power Company is the cooperating agent.

San Joaquin River

Darwin Creek (11,000 feet); Mammoth Pass (9500 feet) and Florence Lake (7200 feet) are the key courses. Established courses on this stream basin are Agnew Pass (9500 feet); Piute Pass (11,200 feet); Huntington Lake, Kaiser Pass, Burnt Corral Meadow (9700 feet); Chilkoot Lake (7500 feet) and Blackcap Basin (10,500 feet). Proposed courses are Isberg Pass (10,000); Reds Meadow (7700 feet); Mono Creek Pioneer Basin (11,000); Jackass Meadow and Hoffman Meadow. Burnt Corral Meadow and Blackcap Basin are in the North Kings Basin but close to the San Joaquin divide. Darwin Creek is in Bishop drainage, but also close to the San Joaquin divide. Cooperating agencies are The Southern Sierra Power Company, the Yosemite National Park, the city of Los Angeles, the San Joaquin Light and Power Company and the Southern California Edison Company.

Owens River

The snow courses on this stream basin are located on Mammoth, Rock, Bishop, Big Pine and Cottonwood creeks. All of these courses have been surveyed for three or more years. Key courses are Mammoth No. 1 (9500 feet); Darwin Creek (11,100 feet). Other courses included in the survey are Mammoth No. 2

(8300 feet); Minarettes No. 1 (9000 feet); Minarettes No. 2 (3300 feet); Rock Creek No. 1 (10,000); Rock Creek No. 2 (9,050 feet); Rock Creek No. 3 (8700 feet); Lamarck Creek (10,500 feet); Blue Lake (10,300 feet); Sawmill (10,200 feet); North Lake (9500 feet); South Fork (8000 feet); Bishop Park (8500 feet); Big Pine Creek (9800 feet). These surveys are conducted by the city of Los Angeles and the Southern Sierra Power Company.

Kings River

These surveys will include snow observations on the North Fork, the Middle Fork and the South Fork of the Kings River watershed. Single point observations have been made in past years, but snow courses have just been established. The key courses selected are Cliff Camp (6300 feet); Sand Meadow (8100 feet) and General Grant Park (6660). Other courses have been located at Statum Meadow (3300 feet); Wood chuck (9000 feet); Beard Meadow (9700 feet); Black-cap Basin (10,500 feet); Post Corral (8300 feet); Long Meadow (8400 feet); Burnt Corral Meadow (9700 feet); Helms Meadow (8500 feet); Swamp Meadow (9000 feet); Dinkey (6600 feet); Bear Ridge (7200 feet); Fred Meadow (7000 feet); Bishop Pass (11,400 feet); Moraine Meadow (8400 feet); Rowell Meadow (9200 feet); Horse Corral Meadow (7600 feet); Kennedy Meadow (7600 feet) and Big Meadow (7600 feet). Courses are proposed at Woods Lake and Bullfrog Lake. Cooperating agencies are the San Joaquin Light and Power Corporation, the Southern Sierra Power Company, General Grant and Sequoia National Parks, Tulare Lake Water Storage District and Fresno office of the U. S. Weather Bureau.

Kaweah River

No courses have been established on this stream basin to date. Proposed key courses are Mineral King and Giant Forest. Other proposed courses are J. O. Pass, Lone Pine Meadow, Redwood Meadow, Hockett Meadows and Columbine Lake. A course is established at Big Meadow (7600 feet) which is in the South Kings Basin but very close to the Kaweah divide. For the Big Meadow Survey the cooperating agencies are the Tulare Lake Water Storage District, and General Grant and Sequoia National parks.

Kern River

A proposed course at Whitney Meadows, and established courses at Monache (8000 feet), Round (9000 feet) and Cannel Meadows (7500 feet) constitute the key courses on this watershed. Other established courses are Burnt Corral (6200 feet); Lloyd Meadows (5500 feet); Little Whitney (8500 feet); Ramshow Meadows (8700 feet); Casa Vieja Meadows (8500 feet); Bench Meadows (7800 feet); Windy Springs (6200 feet) and Ronita Meadows (8500 feet). Courses are proposed at Sand Meadows, Columbine Lake, Moraine Lake, Rock Creek-Army Pass and Wet Meadows. Some observations have been made in previous years at Windy Springs and Monache Meadows. On these surveys the cooperating agencies are the Kern County Land and Water Company, Miller & Lux and The Buena Vista Water Storage District. There is a proposed cooperation with the Southern California Edison Company and the city of Los Angeles.

How it All Came About

First I got tonsillitis, followed with appendicitis and pneumonia.

After that I got erysipelas with hemochromatosis. Following that I got polyomyelitis, and finally ended up with neuritis. Then they gave me hypodermics and inoculations.

No, sir, I thought I never would pull through that spelling test!—*New Yorker*.

Down in Houston, Texas, a man has discovered that danger signs are based on the wrong psychology. He says tell a man to "Stop, look, listen," and he is impelled to do none of the three. He suggests for railroad crossings:

"Come ahead. You're unimportant."

"Try our engines. They satisfy."

"Don't stop. Nobody will miss you."

"Take a chance. You can get hit by a train only once."

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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

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

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Vol. 7 NOVEMBER, 1929 No. 11

Autos to Create New Type of City Declares Babson

ROGER W. BABSON, writing in the *Boston Transcript* describes the city of the future as follows:

The city of the future will look entirely different from the city of today. One of the first measures, I believe, will be street widening through elimination of sidewalks. Pedestrian traffic in the cities will be underneath arcades. This can be done by tearing away a portion of the lower floor of buildings and by supporting the street walls up to the second story on pillars, and utilize as sidewalks the space underneath which was formerly a part of the first floor. The former sidewalks will be part of the streets. Overhead passes across streets for pedestrians will be almost universal. Great arterial highways will go through the center of our cities. These will be supplemented by smaller high-speed highways around the outskirts of the central business district. The city of the future will also be more decentralized than at present. It will spread out into what are now suburbs. Already many big department stores are establishing branches in a wide suburban area. The purpose is to reach those customers who, because of traffic congestion, are unable or unwilling to patronize the central store. This decentralization and expansion process is expensive. In time it will hurt the value of the centrally located city property; but it will increase the value of suburban business property. The reason why down-town property is more valuable than any other is because the most people pass there on foot. If foot travel becomes so dangerous or so slow in these areas that it diminishes in volume, then the value of such property will diminish.

One important reason why the automobile has caused so much congestion is that many of our cities were allowed to grow as they started; namely, along the lines of old cart paths. It is a vast and expensive undertaking to straighten and widen crooked and narrow streets. However, that is being done and will be done on a much larger scale in the future. City governments should take care, however, that future expansion is along sensible lines, and in accordance with a comprehensive and thoroughly unified traffic plan. Before starting new projects the advice of expert engineers and traffic authorities should be obtained. Otherwise much money can be wasted without accomplishing any real improvement.

78,800 Miles Highway Constructed Under U. S. Program

A TOTAL of 78,797.6 miles of federal aid highways had been completed August 31, according to figures compiled and made public on October 7 by the Bureau of Public Roads.

Three states having the highest amount of federal aid roads completed on that date, according to the bureau, were: Texas, 6141.1 miles; Minnesota, 3854 miles, and Nebraska, 3559.4 miles.

Two states and a territory having the lowest mileage completed were: Rhode Island, 172.1 miles; Delaware, 212.9 miles, and Hawaii, 172.1 miles.

A total of 10,321.7 miles, of which 8724.4 were initial, and 1597.3 were stage, was under construction at a total estimated cost of \$259,691,965.90, and with a federal aid allotment of \$104,613,910.33.

Texas had the largest mileage, 966, under construction; North Dakota was second, with 561.6 miles, and South Dakota third, with 546.1 miles.

Hawaii, with 6.6 miles under construction; Connecticut, with 12.5 miles under construction, and Rhode Island, with 17.1 miles under construction, were lowest in mileage.

A total of 2347.6 miles at a total cost of \$50,731,365.23 and a federal aid allotment of \$19,839,505.36 was approved for construction on August 31, the bureau said.

Of the total mileage approved for construction, according to the bureau, North Dakota had the largest mileage, 288.2; Montana next, 221.8 miles, and Kansas third, 157.5 miles.

Three states having the smallest mileage approved for construction were: Mississippi, 0.1 mile; Rhode Island, 1.5, and Massachusetts, 5.

There remained a total of \$41,566,632.59 as a balance of federal aid funds available for new projects, according to the bureau.

Six states having the largest balances of federal aid funds available for new projects, according to the bureau's figures, were: New York, \$3,679,100.66; Montana, \$2,724,032.48; Illinois, \$2,606,225; Arizona, \$2,133,114.66; Georgia, \$2,023,796.56, and Alabama, \$1,969,823.58.

JAPANESE "RULES OF THE ROAD AND HINTS TO MOTORISTS"

(1) At the rise of the hand of policeman, stop rapidly. Do not pass or otherwise disrespect him.

(2) When passenger of the foot hove in sight, tootle the horn. Trumpet melodiously at first. Then tootle with vigor, and express by word of mouth the warning, "HI! HI!"

(3) Beware of the wandering horse that he shall not take fright. Go soothingly by.

(4) Give space to the festive dog that makes sport in the roadway. Avoid entanglement of the dog with your wheel spokes.

(5) Go soothingly on the grease-mud as there lurks the skid demon. Press the brake of the foot as you roll round the corners to save the collapse and tie-up. —Clipped.

There is now a positive means of distinguishing between the male and female worm. The latter makes no signal when turning.

CARELESS FAULTS OF CAREFUL DRIVERS

(Continued from page 7.)

Too many people are driving fast and going nowhere. A few days ago a car passed me at breakneck speed on a narrow mountain road. I overtook it only a quarter of a mile ahead, parked alongside the road with the family preparing for a picnic lunch!

Upon inquiry I learned this family was staying at a resort less than five miles away and had all day to make the trip. Why that driver was risking the lives of all in the car merely to get nowhere particularly is incomprehensible.

"GOING NOWHERE IN A HURRY"

Every one has witnessed the spectacle of drivers dodging madly into and out of traffic in the cities and has joggled along and caught up with these same drivers at the next automatic signal. Simply another case of going nowhere in an awful hurry.

Most careful drivers are extremely punctilious about the manner in which they give the hand signals. Yet I have noticed a great many who pride themselves on being careful, who do not give the right turn signal at all except in the presence of a traffic officer.

Although not as important as the left turn signal, it is, nevertheless important. It is particularly so at intersections where pedestrian traffic is heavy for it lets the pedestrian know what the driver is going to do.

SLOPPY SIGNALS

Some otherwise careful drivers give the left turn signal in a very sloppy manner. Many apparently think it is sufficient to poke the arm out of the window, making it impossible for those behind to tell whether the driver is merely slowing down or going to make the turn. A very large number give the signal entirely too late.

Cutting the corners is another practice of many "careful" drivers. It's an easy habit to get into, especially at intersections where traffic is light. If indulged in continuously, it is sure to get the driver into trouble, sooner or later.

Following too close is another bad habit indulged in by a lot of otherwise careful persons. Our records show it causes a very large percentage of the accidents in the crowded cities.

HEADLIGHT NUISANCE

The glaring headlight nuisance is largely the fault of the driver who thinks he is care-

ful. If every man who swears and raves about the many glaring lights he meets on the road would take the trouble to examine his own lights, the nuisance would disappear over night.

Lights should be checked often. A good heavy jar will sometimes throw them out of focus. So the careful driver can never be sure he has anything to brag about concerning his lights unless he checks them up regularly. Walk about a hundred feet up the road some night, take a look at your lights and judge for yourself.

During the last six months our officers have stopped more than 30,000 persons with glaring lights. Almost invariably it was a complete surprise to the driver to find out that his lights were out of focus.

WATCH THE DETAILS!

You can't neglect the little things and be a careful driver. Some otherwise careful persons let dirt and mud collect on the lens of their rear lights until they are almost obscured. Others neglect to check the connections and drive for miles without a rear light until stopped by some officer.

Most careful drivers turn their lights on early in the evening as dusk approaches. Others do not however and accidents are frequent particularly accidents involving pedestrians. Our records show a very large percentage of accidents occur in the "half-light" period just before dark.

Don't be afraid to turn on your lights. If your battery is low speed up your generator a bit.

A most common fault of nearly all who believe they can handle a car well is that they travel too much over crooked mountain roads on the down-grade with their cars in high gear. They make a little better time that way but are compelled to use their brakes constantly.

USE LOWER GEARS

It is very dangerous to use the brakes to their full capacity when a car is traveling with any degree of speed in sand or gravel. The wheels lock and the car is very likely to skid to one side. Low and intermediate gears are meant for just such situations. Why not make use of them?

It is very possible that few if any of us are 100 per cent careful drivers. Many drive according to their moods; today careful and watchful, tomorrow reckless.

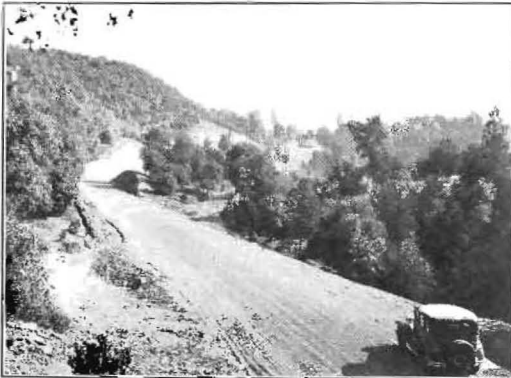
Few serious accidents happen to the initiate driver. It is the old-timer who thinks he can drive well and perhaps he can. But he can no more afford to take chances than the novice.

High Points in October Awards

IMPROVEMENTS of alignment, the replacement of unsatisfactory bridges, the elimination of danger points, widening and surfacing of old highways, together with new work of major importance are provided in state highway contracts awarded during October. The following statement gives the nature of the work included in the various contracts:

OLD TRAILS HIGHWAY—A contract awarded October 1, 1929, provides for grading and surfacing with oil-treated crushed gravel or stone a section of the Old Trails Highway situated between a point 2 miles west of Argus and a point $1\frac{1}{2}$ miles west of Siberia in San Bernardino County. This section is 19.5 miles in length. The surfacing is to be 20 feet in width. Drainage ditches and bridges are to be constructed to protect the road bed from cloudbursts. This project parallels the Santa Fe Railroad from the east into California. It will replace the present unimproved desert road, and is a continuation of the work now under way from Daggett easterly. The contract was awarded to the New Mexico Construction Company, Inc., of Denver. The contract price is \$368,022.10.

Another contract on this same road was awarded to the same company at a contract price of \$384,535.40. This second contract covers a section situated between points $1\frac{1}{2}$ miles west of Siberia and 6 miles east of Amboy. It provides for grading and surfacing this stretch of highway, 22.4 miles in length, with oil-treated crushed gravel or stone. The surfacing is to be 20 feet in width. Storm ditches, dykes and timber trestles for protecting the roadbed from cloudbursts



The Mother Lode Highway is seeing its first construction. This view shows a completed graded section in Calaveras County south of Mokelumne Hill.

are also to be constructed. This project lies in a desert country east of Barstow.

PACIFIC HIGHWAY—A contract was awarded to H. E. Doering of Portland, Oregon, to construct a steel deck truss bridge across the Shasta River in



WHEN PUSHING A PLANIMETER IS A PLEASURE.

Siskiyou County about 6 miles north of Yreka. This bridge will have one 139-foot suspended span, two 138-foot cantilever arm spans, two 138-foot anchor arm spans and two 52-foot steel stringer approach spans on concrete piers and abutments. The clear width of bridge roadway will be 24 feet. The deck is to be 260 feet above the river bed. This bridge is the second crossing of the Shasta River north of Yreka and is a portion of the realignment through the Shasta River Canyon. The contract price is \$190,368.50.

The contract for constructing a reinforced concrete girder bridge across the Coon Creek overflow in Placer County was awarded to C. C. Gildersleeve of Napa. The structure will consist of a 20-foot span on concrete abutments with wing walls. The contract also provides for grading and paving the approaches with Portland cement concrete. The contract price is \$8,738.50.

A contract for furnishing, hauling and placing untreated crushed gravel or stone surfacing on the section in Tehama County, between the Butte County line and Red Bluff, was awarded to Hemstreet and Bell of Marysville. The contract price is \$11,137.80.

A contract for widening about 6.9 miles altogether of roadbed in Colusa County was awarded to C. R. Merrill of Williams. The roadbed is to be increased to a width of 26 feet. The contract price is \$11,251.68.

REDWOOD HIGHWAY—A contract providing for grading and paving with Portland cement concrete and bituminous macadam 1.8 miles of highway between Gallinas Creek and San Rafael in Marin County was awarded to Granfield, Farrar and Carlin of San Francisco at a contract price of \$133,231.75. The plans call for concrete paving partly 20 feet in

width and partly 30 feet in width. This project eliminates some particularly bad alignment and blind curves. It also shortens the route some 1600 feet. The new alignment crosses the Northwestern Pacific Railroad near Forbes, at which point an overhead structure will be built under another contract.

A contract was awarded to Smith Brothers of Eureka to place perforated metal pipe underdrains between Elk Valley and a point $1\frac{1}{2}$ miles south of Smith River in Del Norte County. This work is made necessary by the heavy rains that occur there. The contract price was \$16,346.24.

E. C. Coats of Sacramento was awarded the contract for grading and surfacing with untreated crushed gravel or stone a section of highway between Fish Creek and Stevens Grove in Humboldt County. The surfacing is to be 20 feet in width. The road will be constructed on a new alignment that eliminates many sharp curves on the present rather crooked road. The contract price is \$130,767.60.

The contract for constructing a reinforced concrete bridge across San Antonio Creek in Sonoma and Marin counties was awarded to McDonald and Maggiora of Sausalito, the contract price being \$20,035. The bridge will have three 40-foot spans on concrete abutments with a clear roadway width of 34 feet.

GOLDEN STATE HIGHWAY (Valley Route)—McCray Company of Los Angeles were awarded a contract for grading and paving with Portland cement concrete a section of highway 1.1 miles in length between Newhall Tunnel and Newhall in Los Angeles County. The roadbed is to be graded to a width of 40 feet and the pavement is to be 20 feet in width. This project will improve the unsatisfactory alignment now existing immediately north of the tunnel. The contract price is \$69,087.24.

A contract providing for the removal and disposition of the old Herndon Bridge in Fresno and Madera counties was awarded to William Wilcox of Selma at a contract price of \$1,800.

A contract for the construction of a reinforced concrete girder bridge across Cottonwood Creek in Madera County was awarded to George G. Wood of Fresno at a contract price of \$28,962.50. The plans for this bridge called for six 33-foot spans on concrete pile bents and concrete abutments with wing walls on pile foundations. The width of roadway is 32 feet and a 5-foot sidewalk is provided. This new bridge will replace the present dilapidated structure built by the county some years ago.

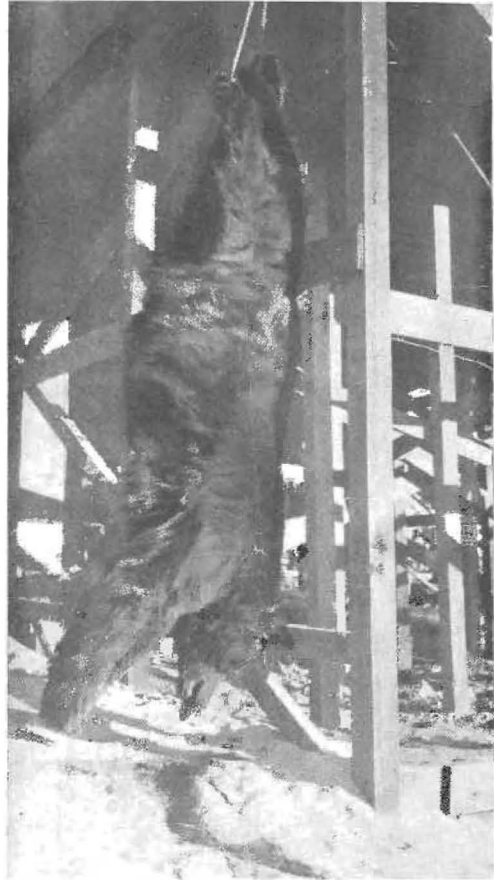
M. B. McGowan of San Francisco was awarded a contract to construct two timber bridges across French Camp Slough in San Joaquin County. These two timber trestle bridges built in pile bents will have 8 and 11 spans respectively, these spans having a uniform length of 19 feet. The roadway will be 34 feet in width. These bridges are on a new right of way and provide a new entrance to Stockton along McKinley avenue. The contract price was \$23,543.50.

RED BLUFF-SUSANVILLE LATERAL—A contract for surfacing 28.7 miles between Paynes Creek and Morgan Springs in Tehama County was awarded to A. F. Giddings of Sacramento at a contract price of \$95,757.50. The surfacing is to be of untreated crushed gravel or stone, 18 feet wide.

COAST HIGHWAY—Matich Brothers of Elnore were awarded a contract for grading and paving about 0.2 of a mile west of San Clemente in Orange County. The pavement is to be Portland cement concrete. The contract price is \$8,872.75.

A contract for grading and paving with Portland cement concrete 1.5 miles at San Ardo in Monterey County was awarded to Fredrickson and Watson and

THAR'S BEAR IN THEM HILLS



This black bear was trapped on October 12, 1929, by convicts and free employees at Camp 19, in Indian Basin, near General Grant Park. The bear measured 7 feet 11 inches from tip to tip.

Fredrickson Brothers of Oakland. This project includes the bridge approaches at San Ardo and 0.74 of a mile of line revision south of San Ardo. This revision of alignment will eliminate several short radius curves. One of these curves, located in a deep cut, has caused numerous accidents. The road will be shortened 960 feet. The width of pavement will be 20 feet. The contract price is \$95,450.30.

MOTHER LODGE HIGHWAY—Adams Company of Angels Camp was awarded a contract to surface with screened gravel 2.2 miles of highway south of Mokelumne Hill in Calaveras County. The contract price is \$8,738.50.

SAN SIMEON-CARMEL HIGHWAY—A contract to construct a timber bridge across Villa Creek in Monterey County about 23 miles north of San Simeon was awarded to H. C. Whitty of Sanger. This bridge will have ten 19-foot spans on frame bents with concrete pedestals. The roadway of the bridge will be 21 feet in the clear. This bridge is on a section, the

grading work of which is being done by convict labor. The contract price is \$11,644.

PLACERVILLE-TAHOE HIGHWAY—A contract for surfacing a section of highway extending from Logtown to a point 3.8 miles south in El Dorado County was awarded to Hemstreet and Bell of Marysville. The contract price is \$11,750.

TRINITY LATERAL—The construction of a steel deck truss bridge across the South Fork of the Trinity River about 2 miles west of Salyer in Humboldt County was awarded to the Mercer-Fraser Company of Eureka. This bridge will consist of one 240-foot span, two 80-foot cantilever arms and four 20-foot steel stringer approaches. It will replace the present bridge which is considered both narrow and dangerous. The contract price is \$97,650.

LOS ANGELES-OWENS VALLEY HIGHWAY—Fred W. Nighbert of Bakersfield was awarded a contract for grading and surfacing 3.7 miles between Little Lake and Coso Junction in Inyo County. The road is to be surfaced with oil-treated gravel. The contract price is \$63,297.69.

HOW CALIFORNIA PLANS ITS HOSPITALS

(Continued from page 15.)

10-year building construction program, was presented to the legislature by the Governor in the budget for the eighty-first and eighty-second fiscal years.

For the first time in the history of California, this 10-year building program set forth the needs of the state institutions during the next decade, in order not only to provide for their natural growth, but also to remedy the present needs as stated above. The 10-year building program proved that this could be accomplished within the funds that could reasonably be expected to be made available for expenditure for construction purposes during succeeding bienniums for the next ten years.

In connection with this program, the Division of Architecture prepared plot plans of all state institutions showing all existing buildings, and the location of all proposed buildings required at each institution, to properly house and care for all inmates and employees, which will be within its borders at the end of the 10-year period.

ORDERLY GROWTH ASSURED

By thus planning ahead, all the state institutions are assured of an orderly growth, equal to the demand made upon them and the Division of Architecture is enabled to solve and plan such problems as roads and walks, steam distributon, water supply and irrigation systems, electric and gas service, sewer systems and disposals, in the most economical way, and have construction of them carried out in logical sequence.

THE BAYSHORE HIGHWAY DEDICATION

(Continued from page 10.)

steps should be taken to carry the pipe line across the slide area. This was done by the construction of a suspension bridge 165 feet in span. The night after the suspension bridge was completed and the pipe line was supported thereon, the ground beneath the line dropped vertically about 10 feet. Had this taken place a day earlier most serious consequences might have ensued.

On several sections fills running upward of 50 feet in height across tidelands produced displacements of the surrounding marsh extending, in extreme cases, to over 300 feet beyond the toe of the slope. Drops from 8 to 15 feet within a short time were common experiences. In these lateral movements of the soil, great quantities of fill material were carried on the crest of the moving ground to the extreme limits of the movement.

A sound method of building drainage structures developed and used in this district to overcome difficulties encountered on marsh flats and sliding hillsides were successfully applied during the execution of this contract. In the case of pipes and structures the fill was first made and the maximum settlement procured and then re-excavated for structures. If minor structures had been placed first, they would have been totally wrecked and rendered useless. In the case of larger structures the fill was first made, piles were then driven through the fill by means of followers to somewhere near cut-off; fills were then excavated and heavy concrete mats built on pile foundations after which side walls and tops were placed.

The opening to traffic of the state's 12.9 miles of the Bayshore Highway, augmented by the 3.1 miles inside of the city and county of San Francisco, provides 16 miles of high standard commodious road and with funds budgeted for the purpose there will shortly be added two new sections, San Mateo to Redwood City and Redwood City to Embarcadero road, Palo Alto, a distance of 14 miles.

Following the construction to Palo Alto it is expected that the remaining 14 miles necessary to reach San Jose, will be constructed as rapidly as funds will permit.

The meek-looking woman with shell-rimmed spectacles was applying for a driver's license.

"How many miles have you driven?" asked the official.

"Fifty thousand miles—and never had hold of the wheel!" interposed her husband, stepping up.

She got the license.—*Detroit Motor News.*

Validity of 1929 Dam Law is Upheld

THE constitutionality of the legislative act of 1929 increasing the power of the State Engineer over dam structure built or repaired in California was upheld in a sweeping decision rendered by the Third Appellate District on October 25, 1929.

The case arose over the application for a writ of mandate directed against the auditor of the city of Stockton to require him to issue a warrant to Brent Brothers, Inc., for work done under a contract for the construction of a flood control dam.

After the new law became operative, certain modifications in the plans were demanded by the State Engineer in accordance with the duties imposed upon him by the act of 1929. These changes were accepted and the dam built in accordance with the requirements imposed by the State Engineer. The auditor of the city of Stockton refused to draw his warrant in favor of the contractors on the ground that the plans for the construction of the flood control dam had been changed to such an extent that it voided the contract under which the contractors were seeking compensation.

BASIS OF DECISION

The decision of the court was awaited with great interest, inasmuch as the proceeding involved the constitutionality of the act. The following excerpts from the decision, bearing upon this subject, will be of interest. We quote as follows:

"The first suggestion which we will consider is the unconstitutionality of the act in that it is in violation of the constitutional provisions of this state and of the United States relative to the impairment of contracts; and, also, that it confers upon the State Engineer arbitrary powers enabling him to adopt rules and regulations which, if violated, subjects the violator to a penalty of \$2,000 or imprisonment in a county jail not exceeding six months, or both. While the act referred to does not, by its terms, define of what material any dam shall be constructed, whether of concrete, whether of rock-filled dam, or whether partly of concrete and earth filling, or of rock filling, it does provide for the inspection of any proposed dam and the making and proposing of amendments to any plans or specifications for the erection of a dam. As we read the act there is nothing which authorizes the State Engineer to directly require the construction of a dam according to any particular plans or specifications, nor does the act authorize the State Engineer to make any material alterations in any contract which has been entered into between an owner and contractor for the construction of a dam. But while the act does not, in

terms, directly authorize the State Engineer to do what we have mentioned, it does indirectly give him power to enforce his recommendations and suggestions by enabling him to begin actions to enjoin and restrain the construction or maintenance of any dam not constructed or repaired according to approved plans and specifications, and through the medium of the court affect the safety of persons and property living below the point or place of the construction of the dam, and the creating of a reservoir which might become a menace to the property and lives of persons in the course which the impounded waters would take in the event the proposed structure proved inadequate to withstand the pressure of the impounded waters. We do not need to pass upon the question as to the validity of section 17 of the act referred to for the simple reason that if it should be considered void under the reasoning of the case of *Schaerlein vs. Cabnis*, 135 Cal. 466, 469, no other portions of the act are thereby affected. Section 18 of the act authorizing the State Engineer to institute actions by way of mandamus or injunction puts teeth enough therein to make all the reasonable mandates of the State Engineer effective. While not so denominated, the act is purely a police regulation and must stand or fall as so considered.

A brief definition and statement will show the validity of the act as a police regulation and proper exercise of the sovereign power of the state. * * * The police power of the state differs materially from the powers of eminent domain. In eminent domain one's property can be taken for public use only upon just compensation. Under the police powers it may not simply be taken, but destroyed without any compensation, depending upon the statutes of the state. Again: "The police power is an attribute of sovereignty, and exists without any reservation in the Constitution, being founded upon the duty of the state to protect its citizens and provide for the safety and good order of society. It corresponds to the right of self-preservation in the individual, and is an essential element in orderly government. * * * It has for its object the improvement of social and economic conditions affecting the community at large, and collectively, with the view of bringing about the greatest good to the greatest number. On it depends the security of society, order, the life and health of the citizen, the comfort of existence, the enjoyment of private life and beneficial use of property." That the police power of the state to supervise and regulate the construction and maintenance of dams impounding large bodies of water, remained unexercised until the disastrous consequences following the breaking of the St. Francis dam in the southern part of the state, is no argument against its existence, but the experiences attending the breaking of that dam emphasize the necessity for, and the constitutionality of the police powers being extended to, and including such structures in order that the safety of persons and property may be conserved. (1) With these statements as a premise, we think the conclusion clearly follows that the act of the legislature approved June 10, 1929, is constitutional in all its essential provisions, as not only a proper, but as a necessary exercise of the police power of the state. A limited number of authorities only need be cited. (Citations follow.)

While differing in the circumstances presented, the principle is the same. (2) The conclusion, therefore, follows that while the act under consideration does not authorize the State Engineer to make a material alteration in the plans and specifications for the construction and maintenance or repair of any structure coming within the purview of the language used in section 2 of the act approved June 10, 1929, defining dams, it does authorize the State Engineer to prevent by injunction, suits or other appropriate court procedure, the erection or maintenance of any structure impounding waters in such a manner as to create a menace to the safety of persons and property living and being along the course where such impounded waters would flow if suddenly discharged. In other words while under the constitutional provisions we may admit that the State Engineer can not impair the obligations of contracts, he can maintain suits to prevent contracts from being so executed and performed as to create a menace to life and property."

CHANGES MADE BY STATE ENGINEER

The changes made by the State Engineer in the plans and specifications for the structure are outlined in the decision as follows:

The change in the plans and specifications adopted by the city of Stockton, as made by the State Engineer, involved decreasing the radius of the arch section and varying the radii for the horizontal arch sections in length from the base to the crest of the dam. The height, capacity, general location and general type of the dam were not changed. The location of the central portion of the arch was moved up-stream about 50 feet, and the left abutment down-stream approximately the same distance. No considerable lateral displacement was made in the central mass of the dam. The quantity of foundation excavation required was about the same as specified in the original plans. The quantity of concrete required to make the necessary changes was increased about 10 per cent above that estimated under the original plans. No material modification of the gravity section abutments are involved in the proposed changes. No change is made in spillway, outlet or flood control works, nor in the specifications regarding construction.

Further findings of the court are given in the syllabus as follows:

"In this proceeding for a writ of mandate to compel a city auditor to issue a warrant for work done under a contract for the construction of a dam, where defendant's bid for the work was accepted and an estimate as to the amount of the materials to be used was made and the contract provided a certain price to be paid per unit, and certain alterations in the plans and specifications for the erection of the dam were made in accordance with the recommendations of the State Engineer, made under the power given him by the act regulating the construction of dams (Stats. 1929, p. 1505), which alterations caused a slight increase in the total price to be paid for the construction of the dam, it is held that the unit price method adopted under the contract made it unnecessary for the city to call for new bids for the increased amount of work and that section 1 of article XXIII of the Stockton city charter, which provides that contracts for work in excess of \$1,500 can only be let after bids being received therefor, was not violated by permitting petitioner to perform the additional work required even though no new contract therefor was made.

"Where unseen emergencies arise after the letting

WATER HYDRAULICS OUT CUT; SLUICES FILL



The above pictures show construction of a 70-foot fill on Force-Currihan & McLeod's job east of Bakersfield, on the Kern River route. The fill was about 70 feet in height and the cut about the same in depth. About 75 per cent of the material was moved by sluicing. The water washed the material into the fill and assisted in compacting the material. The contractor is now completing the moving of excavation by the use of two power shovels and a number of trucks.

of a contract for public work by a municipal corporation and the beginning of the work, further publication and letting of bids are not required; however, a distinction is made between the amendments or alterations in the plans and specifications which do not affect the material character of the work and those admitted changes or alterations which constitute substantial modifications or changes in the character and quality of the work to be performed.

"In this proceeding for a writ of mandate to compel the issuance of a warrant by a city auditor in payment for work done under a contract for the erection of a dam, where alterations in the specifications therefor were made upon the order of the State Engineer empowered so to do by an act regulating the construction of dams (Stats. 1929, p. 1505), which became effective after the letting of the contract, it must be assumed that the municipal corporation in adopting plans and specifications, and the contractor in entering into the contract, did so with the knowledge of the law applicable."

San Gabriel Dam
Experts Named
to Make Study
Reclamation
Flood Control

Review of October Activities In the Division of Water Resources

EDWARD HYATT, Chief of Division

Water Rights
Water Resources
Investigation
River Flow

SAN GABRIEL DAM

Construction of San Gabriel Dam by the Los Angeles County Flood Control District was stopped by the district during October, after receipt of an adverse report on foundation conditions by a board of engineers and geologists. This dam as planned would have been higher and more massive than any in existence, and would cost about \$25,000,000. It is reported that \$3,000,000 had been expended on it when work was stopped.

As the dam was under construction when the new law took effect, and as the district had not yet made application for its approval, it did not come within the jurisdiction of the state until a formal application was made by the County Flood Control District on October 26, accompanied by a filing fee of \$14,875.23. The application asks for the approval of the dam as originally planned. The Division of Water Resources will now take jurisdiction and make an investigation of the plans, specifications and foundations, which investigation will normally lead to either an approval, disapproval, or modification of the application.

SAN GABRIEL DAM BOARD

Immediately following the assumption of jurisdiction by the state, an investigation of the safety features of the plans, specifications and foundations of San Gabriel Dam was ordered. In view of the unprecedented size and height of the San Gabriel Dam, the difficult technical considerations pertaining to the design and foundations, and its importance to the valley below, the investigation to be made by the state will be comprehensive.

Under the law the State Engineer is empowered to employ consultants to report upon safety features, and in the case of San Gabriel Dam it has been decided to appoint a board consisting of three geologists and three engineers. This board consists of men of outstanding qualifications and wide experience in their respective fields, none of whom have heretofore been associated with the San Gabriel project. The personnel as announced by State Engineer Edward Hyatt is as follows:

Engineers: J. L. Savage, Chief Designing Engineer of the United States Reclamation Bureau. Dr. Elwood Mead, Commissioner of Reclamation, was asked to appoint the best qualified man from the unsurpassed Reclamation Bureau personnel and Dr. Mead has appointed Mr. Savage. Mr. Savage as Chief Designing Engineer of the Bureau, has for many years been in direct charge of the high masonry dams built by the Reclamation Bureau and is recognized as an authority on this subject.

George A. Elliott, Chief Engineer, Spring Valley Water Company, San Francisco: Mr. Elliott is one of the best known and best qualified engineers on dam construction on the Pacific coast. As chief engineer of the Spring Valley Water Company he has been in charge of all work on dams for that company, including the building, operation and maintenance of many large dams.

Mr. M. C. Hinderlider, State Engineer, Denver, Colorado: Mr. Hinderlider's record and reputation are impressive. As a consulting engineer many years in Denver, he directed the construction of dams both in the United States and Mexico. As State Engineer of Colorado he has been in charge of approximately 1000 dams in that state.

Geologists: Dr. Charles P. Berkey, Consulting Engineer, New York City, and Professor of Geology, Columbia University: Dr. Berkey's reputation is international as are those of several members of the board. He was a member of the General Sibert Board appointed by the Secretary of the Interior and the President of the United States to report upon the Boulder Canyon Dam, within the last year or two.

Dr. George D. Louderback, Consulting Geologist and Professor of Geology, University of California, Berkeley: Dr. Louderback has supervised construction of several high dams, from the geological standpoint, has reported upon many proposed sites, and was a member of the board appointed by Governor Young to report upon the St. Francis Dam.

Dr. Ira P. Williams, Consulting Geologist, Portland, Oregon, who has examined and reported on the foundations for many dams throughout the northwest, including the highest masonry dam in the west.

The state is fortunate in securing the services of experts of such eminence, ability and impartial judgment. It is expected that the board will convene in Los Angeles early in the week of November 11 and continue their work to completion, which will consist of a report to the State Engineer on the safety of the San Gabriel Dam as presented in the application of the Flood Control District.

San Gabriel Dam also comes under the jurisdiction of the United States Department of Agriculture. Under a reciprocal agreement between the state and the federal offices of the Department of Agriculture will be invited to cooperate in the investigation.

SAN JOAQUIN VALLEY WATER INVESTIGATION

The survey of the Mammoth Pool Reservoir site on the San Joaquin River has been continued with favorable progress. The area above Mammoth Pool Dam site has been covered. The two survey parties will move camp and continue their surveys downstream to the mouth of Big Creek.

On October 4 a party of ten men were put in the field working out of Dinuba for the purpose of locating an exchange canal from the Kings River south to the Kern River. Topography has been taken at the head of the canal to be used in making a layout of diversion works. The tentative elevation for the point of diversion of the canal has been taken as 445 feet. Up to date seven miles of this canal has been run out.

On October 23 another field party was put in the field to bring up to date the survey of the U. S. Engineers on the San Joaquin River from Mossdale Bridge to Mendota.

The crop survey of the San Joaquin Valley south of the San Joaquin River has been completed with the exception of the area in the consolidated district. This area is now being covered by Mr. F. L. Green, working in conjunction with Mr. C. H. Holley. This should be complete within a couple of weeks.

A crop survey has also been completed for the area north and west of the San Joaquin River and south of Patterson. A part of the crop survey has been transcribed to a wall map in the office.

Water supply studies to determine the yield of the unmeasured areas have been continued and the compilation and tabulation of ground water records have proceeded steadily.

During the month a field trip was made along the lower San Joaquin River from Mossdale Bridge to Mendota for the purpose of examining the proposed sites for pumping plants on the river channel which were selected during the earlier part of the investigation, also for the purpose of inspecting the principal diversions of canals now serving lands along the trough of the valley on both sides of the river and examining the state of development and quality of lands adjacent to the river.

SACRAMENTO VALLEY WATER INVESTIGATION

Geological investigations have been made on five dam sites on the Upper Feather River Drainage Basin and reports rendered thereon. These sites are important items in the state-wide development of water resources. Cost estimates of reservoirs at these sites are in progress.

Rapid progress has been made in the classification of lands and survey of crops in the Sacramento Valley. Up to date 900,000 acres have been surveyed in the field and in addition 400,000 acres have been reclassified in the office, based on information previously obtained in preparing the assessments for the Sacramento Valley Flood Control Project. All of this information has been transcribed onto an office map.

A survey has been made of the data available on ground water conditions in the Sacramento Valley and a tentative schedule prepared for collecting data on ground water levels this month. It is proposed to obtain information on about 200 wells distributed geographically throughout the valley. Where possible, wells measured by Kirk Bryan in 1913 will be utilized.

Data are being assembled in the office on water requirements for irrigable and irrigated lands in the Sacramento Valley and additional information is being obtained in the field.

Water supply studies of all the streams tributary to the Sacramento Valley have been continued throughout the month.

KINGS RIVER WATER INVESTIGATION

Water supply estimates have been completed in this investigation for six reservoir sites as proposed by the city of Los Angeles. These sites are as follows: Junction, Cedar Grove, Sentinel, Paradise, Tehipite, Simpson Meadows. Estimates of quantities in rock-fill dams at the several sites have also been completed for the height of dam proposed by the city of Los Angeles. Data are being collected for the purpose of estimating power developments at the various sites. Two conferences have been held with Mr. Randell of the Federal Power Commission.

SALINITY STUDIES

Work in connection with the salinity investigations has consisted principally of compilation and to some extent analyses of the data collected during the past several months.

The highway laboratory has been rendering excellent service in making dual analyses of about 200 samples a day. The field work in the future will be confined principally to making the standard tidal cycle surveys.

SALT WATER BARRIER

A tentative program and budget covering this investigation has been outlined and the work and report of Walker Young reviewed in a general way. The Walker Young Report on the Salt Water Barrier is now being printed, and will be available in about 50 days.

SNOW SURVEYS

Practically final arrangements have been completed in every watershed in the Sierra Nevada Mountains from Kern River on the south to Pit River on the north on the west side and for all the watersheds on the east side for snow gaging courses, extent of participation by the state and by various interested parties. Practically all organizations in the state which have an interest in a water supply from these watersheds have shown themselves to be very much interested in the proposed work and have agreed to make substantial contributions which will amount in some cases to as much as two-thirds of the cost of the field work and which will average for the entire area covered probably about one-half the cost of the field work. The state is furnishing equipment in each case so that everything will be done in a uniform way. This makes quite a heavy expense for the first year but the equipment is substantial and will last for many years. The program as laid out has been somewhat conservative as it was not desired to go too far in the first year. On the other hand it was deemed advisable to cover as much territory as possible.

WATER RIGHTS

During the month of October, 24 applications to appropriate water were received, 20 were rejected, 19 were approved, 7 permits were revoked and 8 licenses were issued.

Water master service was discontinued on all streams in the northern part of the state during the month of October.

NAPA COUNTY INVESTIGATION

The supervisors of Napa County appropriated \$2,000 which is to be matched by \$2,000 additional from the state to start an investigation of the water resources of Napa Valley in particular connection with the proposed diversion from Conn Creek. In resolutions the supervisors stated that it was their belief that the investigation should continue for three years.

SANTA MARIA INVESTIGATION

A meeting was held with the Chamber of Commerce of Santa Maria Valley in regard to an investigation of Santa Maria Valley. While a definite program was not outlined some work has already been started in connection with measuring the streams entering the valley.

IRRIGATION DISTRICTS

During October financial and economic investigations have been made of the Provident, Stinson, James and Terra Bella Irrigation districts. Visits have also been made to the Glenn-Colusa, Jacinto, Anderson-Cottonwood, El Camino, Princeton-Codora-Glenn, Merced, Turlock, Consolidated, Riverdale, Corcoran, Fresno and Tranquillity Irrigation districts. Conferences have been held in Sacramento with the officials of the El Dorado, Oroville-Wyandotte and Nevada Irrigation districts relating to their proposed construction and the economic development of these districts.

Recommendation has been made to the California Bond Certification Commission that the Commission approve requests of the following districts for expenditures in the amounts noted from their construction funds for additional new construction or betterment of their works: Oroville-Wyandotte Irrigation District, \$5,000; La Canada Irrigation District, \$4,339.54; West Stanislaus Irrigation District, \$80,967.03; total, \$90,306.57.

The California Bond Certification Commission has authorized the sale of bonds by the following districts at private sale: Oroville-Wyandotte Irrigation District, \$5,000; West Stanislaus Irrigation District, \$1,000.

DAMS

Activities of this subdivision have been directed first to prosecuting current work and second to development of personnel and methods to adequately handle the duties imposed by the new law governing the supervision of dams, which went into effect in August. Under this law not only must all new dams be supervised by the Division, but also all existing dams must be inspected and either approved or orders issued for their repair. A specialized staff will be necessary to handle this work. The personnel in this subdivision at the present time consists of the Deputy State Engineer, seven assistant engineers, and one field party. Ample office space has been made available on the fourth floor of the Public Works Building.

About 20 dams now under construction are being regularly inspected, the major ones being Salt Springs

(Pacific Gas and Electric Company, Amador County), Lyons (Pacific Gas and Electric Company, Tuolumne County), Juncal, Montecito County Water District, Santa Barbara County, Calaveras (City of Stockton, Calaveras County), Felt Lake (Stanford University, San Mateo County) and Chenery (California Water Service Corporation, Contra Costa County). Thirty-one applications have been received for approval of existing dams, five for new dams, and two for revisions and enlargements, and over \$25,000 in fees received during the current month. Twenty-six field inspections have been made.

The 1929 law governing supervision of dams has been declared by appellate court constitutional in all essential provisions.

RECLAMATION AND FLOOD CONTROL

Maintenance of Sacramento and San Joaquin Drainage District. A contract has been made with A. Mitchell of Sacramento to clear the timber growth from the Sacramento By-pass at a cost of \$875. This work is under way.

Small crews have been engaged on routine maintenance work on the project in Sutter County. Some of the trees growing along the east levee of the Sutter By-pass are being topped to promote a thicker and lower growth for levee protection. The irrigation of willows has been discontinued for the season.

A crew of about 25 men has been engaged in maintenance clearing work in the by-pass channels, and the pumping plants have been placed in condition for operation during the winter.

Floating river equipment has been moved up the Sacramento River to the Sacramento Slough, and is being used as a clearing camp to accommodate approximately 60 men. The crew at present consists of about 40 men, and part of their time will be put in on clearing maintenance in this vicinity. The camp was established primarily, however, for clearing construction under the flood control project.

Emergency Flood Control and Rectification of River Channels. All of the various matters of bank protection mentioned in the last report have progressed in various degrees. Arrangements have been completed for bank protection work in cooperation with Reclamation Districts No. 535 and No. 673 at an estimated cost of \$1,800. These districts have deposited their share of \$1,200.

Request has been made for additional bank protection work on the Mad River on the property of James B. Moore. The estimated cost of this work is \$400, of which the landowners have deposited \$200.

Surveys were made and plans were completed for the bank protection work on the Feather River in cooperation with Sutter County. A contract has been awarded to the Pacific Coast Construction Company for the construction of seven tree and steel retards on the right bank of the Feather River near Nicolaus at a cost of \$12,000. Arrangements have been made to secure the necessary trees for this work and construction will commence at once.

Surveys have been made at Robinson Bend on the Feather River to determine what work is necessary at this point. It was found that the proper procedure here would be to block off with a levee the large wash which has started within the last two years. The cost of this work will be approximately \$6,000, of which Butte County will contribute one-third, the landowners one-third, and the state one-third. Construc-

tion will commence as soon as the contributed funds have been deposited.

Surveys were completed for the proposed bank protection work at Isleton in cooperation with the Division of Highways, and plans are now being prepared in cooperation with the Maintenance Engineer. The estimated cost of the work is \$14,000, of which it is proposed this Division and the Division of Highways shall each pay one-half.

Surveys have been completed for bank protection work on Andrus Island, to be done in cooperation with Reclamation District No. 556.

A number of other bank protection jobs have been under consideration but they have not yet reached a definite shape. These are: Reclamation District No. 70, Reclamation District No. 730, Glenn County Levee District No. 3, and Yager Creek in Humboldt County.

Arrangements have been made to do a small piece of bank protection work at Randall Island in cooperation with Reclamation Districts No. 551 and No. 755. The total cost of this work will be \$525, of which the state will pay one-third. The contribution of the districts has already been received, and work will be commenced in the near future.

RUSSIAN RIVER JETTY

All pile driving work in the jetty structure has been completed as far as it will be carried this season; that is, the south jetty entirely across the bar and to the beach line. The railroad trestle has been completed and the track has been shifted to the high bar. The quarry is being opened up and a coyote hole is being driven for a heavy blast, which will break out about 16,000 tons of rock. It is expected that this can be shot within the next two weeks, after which the operations will consist almost entirely of loading and delivering rock to the jetty. It is fortunate that the track was in place on the high bar and on the trestle, for the reason that during the last week two or three heavy tidal waves broke entirely over the bar and the structure. No damage was done aside from covering a short stretch of the track with sand. The force now on this work consists of foreman and about twenty men.

PAJARO RIVER FLOOD CONTROL

The counties of Santa Cruz and Monterey have each deposited \$1,000 for work in the Pajaro River in accordance with the provisions of chapter 524, Statutes of 1929. The work to be done was examined last week and the procedure determined upon, which will be to clear the channel of all timber growth by hand. The amount available is \$4,000.

FLOOD MEASUREMENTS AND GAGES

A small crew has been organized and is now engaged in examining all the automatic and staff gages maintained by this office for measuring flood stages and flows, which will require approximately six weeks to have everything in working order for the season.

SACRAMENTO FLOOD CONTROL PROJECT

On September 27, the contracts between the Reclamation Board and the Department of Public Works were executed. They completed the arrangements for carrying on the work of flood control project clearing construction which is to be done by

this Department at the request of the Reclamation Board. The work is to consist of clearing in the by-passes at a cost of \$65,000, and clearing in the Feather River at a cost of \$27,558.

Immediately upon the execution of these contracts, an organized force of men engaged in maintenance clearing was transferred to construction clearing and the force was increased to a total of 45 men who have been engaged on the work continuously since that time. This was done on account of the lateness of the season, as it was imperative that work be commenced at once. At the same time, notices calling for bids were sent out covering the bulk of the clearing to be done in the by-pass. These bids were opened on October 14, but only two were received, which were rejected as they were thought to be high by at least 50 per cent.

It seems that there is an unusual condition existing among contractors interested in clearing work. The call for bids was well advertised and, in addition, notices were sent directly by mail to over 30 contractors who have engaged in this work in the past, but not more than eight contractors showed any interest. The two contractors who submitted bids operate large employment agencies in Sacramento.

In order to secure the necessary progress in this clearing work, our floating equipment has been moved to the lower end of the Sutter By-pass and have organized a floating camp which will be capable of accommodating 60 men; and we propose to engage this number of men on the clearing as long as the weather permits. The camp is ideal for this purpose, as it is movable and can be properly cared for when the water rises in the by-pass.

Contract has been awarded to P. D. Maritsas of Sacramento for the clearing of the piles in the channel of the American River. His bid was unusually low, \$1.80 per pile, and it is believed that the entire work can be done at a cost between \$4,000 and \$5,000. The contractor has already commenced work.

Bids have been called to be opened on October 28, for clearing a small area in the channel of the Feather River near Marysville, which is a part of the Feather River clearing construction.

I love the narrow winding road
That leads through farming lands;
I love it for the sparkling streams
That ripple o'er the sands.
But most of all I love it for
Its lack of hot dog stands.

USES AN AIRPLANE TO SURVEY DAM

Fresno—Opening an exhaustive survey of the state water situation and to select a dam site, a group of state engineers headed by Edward Hyatt, State Engineer in charge of water resources, recently completed an aerial tour by Western Air Express planes of the Kings and San Joaquin rivers.

The trip was a success, it was stated by Hyatt, who said that a satisfactory dam site was selected on the San Joaquin River, and that preparations are under way to have the ground survey crew begin work. Watersheds of both rivers were inspected and valuable data gained, the party said.

Those making the trip besides Mr. Hyatt were A. D. Edmonston and R. M. Vaughan of the State Engineer's staff; and E. W. Kramer and J. Nelson of the United States Forest Service, and R. R. Randall, Federal Power Commissioner.

MOTOR VEHICLE DIVISION REPORTS

FRANK G. SNOOK, Chief

NEW LICENSE PLATES

The Division is busily engaged in getting the 1930 supplies to all branch offices in preparation for the coming renewal. The majority of the branch offices have received their assignment of 1930 plates. When the "opening date," December 15th, rolls around, every item will be in readiness.

CALIFORNIA HIGHWAY PATROL

Orders have been issued to all members of the California Highway Patrol by Superintendent Eugene W. Biscailuz to arrest all motorists caught with operators' licenses issued prior to January 1, 1927.

The order conforms to a section of the new law canceling all licenses issued two years or more.

Motorists without a license issued since January 1, 1927, or who can not show evidence that they have applied for one will be charged with a misdemeanor.

Biscailuz said he did not believe any large number of motorists would be affected by the order. The Division believes that at least 85 per cent of all the operators in the state have secured new licenses or have made application for them.

REGISTRATIONS

During the period from January 1 to September 30, 1929, a total sum of \$9,746,193.43 was collected. The total number of dealers, transfers and registrations recorded for this period is as follows:

Automobiles	1,825,986
Trucks, solid tires	20,336
Trucks, pneumatic tires	63,863
Motorcycles	9,099
Trailers, solid tires	10,273
Trailers, pneumatic tires	30,238
Auto dealers	3,248
Motorcycle dealers	70
Trailer dealers	40
Transfers	502,697
Total	2,465,790

Since January 1st, 98,524 nonresident cars have been checked through border checking stations, and 59,986 nonresident permits have been issued as of September 30th.

INSPECTOR OF TRAFFIC

Announcement has been made of the appointment of Captain Otto Langer as inspector in charge of the Bureau of Traffic of the Division of Motor

Vehicles. Captain Langer has been in charge of the traffic squad of San Diego County. His headquarters will be in Sacramento.

OPERATORS' LICENSES

From July 11 to October 23, 1929, the Division, with the able assistance of many police departments throughout the state, has issued 1,414,307 operator's licenses. As of October 23, there were approximately 2,480,000 licensed operators, and between 135,000 and 140,000 licensed chauffeurs.

OCTOBER REPORT OF DIVISION OF ARCHITECTURE

GEORGE B. MACDOUGALL, Chief

BUILDING PROGRAM

In connection with the 1929 appropriations the Division of Architecture has accomplished in the office up to October 1, 1929, the necessary office work for a total construction valuation of \$2,347,963. This exceeds the amount estimated in report dated May 27, 1929, by \$97,963.

Total value of work for which contracts were awarded during October	\$205,423
Projects on which bids are in but awards not yet made	121,388
Projects now out for bids	645,900
Grand total	\$972,706

Institutions included in October program:

Mendocino State Hospital: 3 contracts awarded, \$122,549; 3 contracts pending, \$117,490.

San Francisco State Teachers College: 1 contract awarded, \$15,897.

Pacific Colony: 1 contract awarded, \$8,920.

Sonoma State Home: 3 contracts awarded, \$46,530.

Veterans Home: 1 contract awarded, \$11,527.

Fort Ross, Sonoma County: Award pending for restoration of stockade, \$1,498.

Tahoe Public Camp Ground: Award pending for gate lodge, \$2,395.

Bids to be opened:

State Nursery: Bids for painting to be opened, November 1st.

San Diego State Teachers College: Bids for library and science building to be opened, November 5th.

Public Works Building: Bids upon addition to be opened, November 12th.

Veterans Home: Bids for barracks building to be opened, November 19th.

WASHINGTON—The farm-to-market road bill, recently passed, increases the gas tax from 2 cents to 3 cents. The additional cent will provide an estimated \$2,197,000 the first two years, to be distributed among the 39 counties as follows: one-half equally proportioned, one-quarter in ratio of vehicle registration, and one-quarter in ratio of number of farm.

State Highway Progress Reports

ALAMEDA COUNTY

The reconstruction of the 8.8 miles of highway between Hayward and Niles, widening 11 feet with Portland cement concrete and surfacing the existing 18 feet with asphalt concrete, Hanrahan Co., contractors, is progressing, all the heavier grading on line and grade changes being complete and pouring of concrete in progress.

CONTRA COSTA COUNTY

The acceptance of the Prentiss Paving Company's contract through Pinole and Hercules, opens up the Martinez Highway from Oakland to the Carquinez Bridge. This completed section, together with the widened highway in use, gives a minimum width of 30 feet of surfaced highway to the Carquinez Bridge. The widened roadway is a joy to the motorist though the Sunday crowd utilizes it to capacity.

FRESNO COUNTY

Mr. William Wilcox was awarded the contract for wrecking and disposing of the old highway bridge over the San Joaquin River at Herndon.

The convict camp in the Kings River Canyon under Superintendent D. M. Lee is making good headway on the first section of work opened up. Provisions for winter camp and work are complete.

Tieslau Bros. will soon complete their contract for pre-mixed oil surface from Coalinga to Parkfield Junction on the Sierra-to-the-Sea Lateral. F. N. Hveem is resident engineer for the state.

IMPERIAL COUNTY

Construction work is most favorably handled in the winter in the Imperial Valley and as this season is approaching plans for a number of Imperial Valley projects are nearing completion.

Bids will soon be asked for paving from Brawley to 4 miles west of Westmoreland; paving from Myers Creek to 3 miles west of Coyote Wells, widening and resurfacing from Dixieland to Seeley; paving from El Centro to Holtville; and constructing an under-grade crossing under the San Diego and Arizona Railroad 3 miles west of Coyote Wells.

KERN COUNTY

Bids are being asked for on the construction of 2 miles of realignment on the Cholame Lateral west of Lost Hills.

The Los Angeles Decomposed Granite Company was low bidder on the construction of a pre-mixed oil

surface from Pentland to San Emigdio Road on Route 57.

Five miles of non-skid surface was placed by day labor forces on slippery portions of the Valley Route south of Bakersfield. This is expected to considerably lessen the number of accidents on this tangent during the winter.

Force-Curragan and McLeod are rapidly completing their contract for grading and surfacing on Route 57 from Bakersfield to the mouth of the Kern River Canyon. E. E. Evers is in charge for the state.

KINGS COUNTY

Day labor forces under Jack Milford are grading and widening the roadway from Hanford to Goshen on Route 10. Additional shoulder work from Hanford to Lemoore will soon be put under way.

LASSEN COUNTY

The contract from Susanville to Milford, Hein Bros. and Chittenden, contractors, is now being double shifted and is moving along quite rapidly. No difficulties are anticipated in the progress until wet weather sets in, at which time it will be difficult for the contractor to screen the wet materials, and it may be necessary to shut down during the winter.

It is now anticipated that the work on the contract from Doyle to Long Valley Creek, Myer Rosenberg, contractor, will be completed early in November and will be open for traffic as soon as the bridges which are also under construction on this contract, are completed.

LOS ANGELES COUNTY

The contract for a line change immediately north of the Newhall Tunnel has been awarded to McCray Co. Construction is started on this work.

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

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

A contract on the Foothill Boulevard, between Glendora and Claremont, for constructing 5.5 miles of asphaltic concrete pavement, 30 feet by 6 inches has been completed by Griffith Company, contractors.

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

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

MADERA COUNTY

A. Teichert & Son have been awarded the contract for widening and resurfacing with asphalt concrete from Califa to the county line on the main Valley Highway. Grading operations are well under way.

The contract for a subway at Califa at the junction of the Pacheco Pass Highway with the Golden State Highway has been awarded to Otto Parlier of Tulare.

The Valley Paving Company are grading on their contract from Berenda to Califa on Route 4. Mr. W. T. Rhodes is resident engineer on this work.

MARIN COUNTY

Hanrahan Company of San Francisco were awarded a contract to construct 11.9 miles of highway from 1 mile south of Petaluma to Ignacio, the beginning of the job they finished last year. This section is to be improved by the construction of a 20-foot second-story concrete pavement and bituminous macadam pavement with extensive line changes, particularly the one from Novato to Ignacio, utilizing the concrete bridge under construction at Novato Creek.

A good start has been made; considerable grading and drainage structures completed and concrete pavement should start in a few weeks. This job comes between tourist seasons and it is hoped to have enough of it completed in time to carry the 1930 summer traffic.

The 1.6-mile section between Gallinas Creek and San Rafael, the gap necessary to complete the reconstruction and widening from Petaluma to San Rafael was awarded to Granfield Farrar & Carlin of San Francisco. This is the fourth contract obtained by this company in the immediate vicinity of San Rafael in the last year. Work has just started, but as the most of the work is on an extensive line change, little interference with traffic will result. The value of this line change is very striking as it eliminates a number of sharp curves, including the circuitous section just north of the city limits of San Rafael and avoids protective work over the N. W. P. R. R. Company's tunnel portal. The new alignment furnishes splendid alignment and grades and includes an overhead crossing of the N. W. P. R. R. tracks at Forbes Station which obviates all grade crossings.

This overhead structure is planned to be advertised for bids soon to be completed with the road approaches.

Bids are to be advertised for early in the winter season for the surfacing of the section of new road now being graded between San Rafael and Alto. This, with a number of structures to be constructed are all to be completed for summer traffic in 1930.

MARIPOSA COUNTY

Oil mixing work on the Yosemite All-year Highway has been completed from the Mariposa County line to the Yosemite National Park. This road is now in good condition for the winter travel.

MENDOCINO COUNTY

The construction of three timber bridges and approaches thereto with line changes, on the road from McDonald to the Sea, are nearing completion. While the winter weather will prevent any immediate material benefit, this work will be appreciated when the summer season opens.

MERCED COUNTY

Day labor forces are removing the narrow bridge at the north city limits of Merced and widening the pavement to 30 feet. This will connect with the street widening which the city of Merced is doing and materially improve the entrance to the city.

Oil-mixed rock borders 4 feet in width have been placed on Route 18 from Merced to the county line, making this section safe for traffic in all weather.

NAPA COUNTY

Smith Bros. of Eureka have completed their contract for 5.3 miles of oil-treated shoulders from Napa to Greenwood Corner. The adjacent section, Napa Wye to the Solano County line, Fredrickson & Watson, contractors, to be regraded and surfaced, is nearing completion. These jobs, connecting with the Fredrickson & Watson contract to the east as recently completed, will furnish much improved connection from Napa Valley and Vallejo to Cordelia and the Sacramento Valley.

ORANGE COUNTY

The contract for a line change 0.7 of a mile in length between Serra and San Juan Capistrano was awarded to Match Bros. on August 12th. This work consists of a 40-foot graded roadbed with Portland cement concrete pavement, 20 feet by 7 inches. Grading is completed on about one-quarter of a mile and is in progress on the rest of the contract.

A contract for a line change to connect up the overhead crossing of the A. T. & S. F. Railway at Irvine is rapidly nearing completion. This consists of grading 0.7 of a mile and paving with Portland cement concrete, 30 feet wide. Steele Finley is the contractor.

A contract for paving one-half width between Santa Ana and Anaheim was awarded on June 11th to Griffith Company. This section is 4.9 miles long. The paving work is being done in cooperation with Orange County, the state paying for a strip of pavement 28 feet by 7 inches and the county paying for a like amount. Grading is completed on this contract and about 2 miles of pavement have been completed.

PLUMAS COUNTY

Work is complete on the contract from the Tehama County line to 6½ miles east, Charles Harlowe, Jr., contractor. This section will be put in use by the public as soon as the project immediately west of it

is completed by the Bureau of Public Roads. This will be accomplished about the first of November.

RIVERSIDE COUNTY

The work of constructing the abutments and superstructure of the Wineville grade separation on the Riverside-Pomona Highway is well under way. The work is being done in cooperation with the Division of Highways by the Union Pacific Railroad Company. On completion of the railroad company's contract, the Division of Highways will let a contract for paving the highway under the structure.

Of interest to Riverside County are two bridges being constructed on the Riverside-Pomona Highway. One of these bridges will span the San Antonio Wash at the east city limits of Pomona and the other will cross a storm drain channel at Collins.

That portion of the Riverside-Phoenix route via Mecca and Blythe known as the "Box Canyon" has been damaged by floods three times during the past summer. The Maintenance Department has established a camp at Shavers Well for the purpose of repairing the damage. Grader crews are at work and surfacing material is being supplied where needed. The road is open and in good condition.

SAN BERNARDINO COUNTY

Steel Finley has almost completed his contract from Claremont to Cherry Avenue on the Foothill Boulevard, between Los Angeles and San Bernardino. The pavement widening and resurfacing is complete and open to public traffic. The original 18-foot Portland cement concrete pavement has been widened to 30 feet and resurfaced with asphalt concrete. Simultaneously with this project the Pacific Electric undergrade crossing one-half mile east of Upland has been widened.

George Herz & Company have completed their contract for constructing 20-foot Portland cement concrete pavement on the San Bernardino-El Centro route from San Bernardino to Santa Ana River, a distance of about 2 miles. Special attention has been given to making a good connection with the streets radiating from the intersection in front of the National Orange Show Building.

The Dillon and Boles contract for grading and oil-treated surfacing on the Arrowhead Trails Highway between Yermo and Dunn is nearing completion.

The George Herz & Company contract for similar improvement on the above route from Barstow to Yermo is now well under way.

Two new contracts have been awarded to the New Mexico Construction Company for grading and oil-treated surfacing on the National Old Trails Highway extending from 2 miles west of Argos to 6 miles east of Amboy. Work will soon be started.

The Allied Contractors' project for similar improvement on the above route from 4 miles west of Hector to 2 miles west of Argos is about 70 per cent complete.

SAN DIEGO COUNTY

Work has just been started by the R. E. Hazard Contracting Co. of San Diego on constructing oil rock

borders on portions of the Coast Route between the city limits of San Diego and Oceanside.

A contract for grading the Rose Canyon Road between Balboa avenue and Torrey Pines road was awarded on August 13th to the R. E. Hazard Contracting Company. This section is 5.4 miles long and is to be a 46-foot graded roadbed. About one-half mile has been graded to date.

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

A contract for 4.5 miles of 38-foot graded roadbed between La Posta Creek and Miller Creek on the San Diego-El Centro Highway was awarded on May 27th to the Nevada Contracting Company. Grading is completed for a distance of about 2 miles.

A contract for grading 3.9 miles of 36-foot roadbed from Kitchen Creek to La Posta and paving with 20 feet by 7 inches Portland cement concrete was awarded on June 25th to Busch Bros. About 1 mile of rough grading is completed, and grading is now in progress on about 2 miles. This section is on the San Diego-El Centro Highway.

SAN MATEO COUNTY

The Bayshore Highway, San Francisco to South San Francisco, is complete, except a section of about one-quarter-mile through the deep cut at Sierra Point, where slides have developed. Much of this slide material has been removed but in order to complete the work and to care for the probable additional slides during wet weather, the contractor has retained a small amount of equipment on the job.

Bids are to be advertised for this fall to grade and surface the 7.3 miles section of the Bayshore Highway from 5th Ave., San Mateo to Redwood City. This work, consisting mostly of embankment 60 feet wide, is interesting in that there are three distinct types of material, hydraulic fill, dragline fill and imported borrow to be used in varying arrangements and a total yardage of about 600,000.

SAN MATEO, SANTA CLARA AND SANTA CRUZ COUNTIES

The Skyline Boulevard.—Twohy Bros. Co. and J. F. Shea Co., grading and surfacing contractors, on the 13.8 miles between La Honda Road and Saratoga Gap, having completed their contract, the state forces placed an armor coat oil surface and the road was opened on September 28th. Each succeeding section of this boulevard only further stamps it as one of the finest scenic roads of the state. The rapid change of vista, now the broad Pacific, then the beautiful San Francisco Bay and Santa Clara Valley, with frequent glimpses of wild redwood gulches, or of the sparkling Spring Valley lakes, furnish material for a delightful pleasure trip, spiced as it is with swinging curves and steep slopes, gigantic redwood trees, fragrant pines, colorful madrones and manzanita, with redberries and forest flowers.

SANTA CLARA COUNTY

The section of the Peninsula Highway, Sunnyvale to Santa Clara, N. M. Ball, contractor, is completed

except cleanup. It is the first piece of the contemplated widening of this highway from Palo Alto to Santa Clara in three sections. The second section from Palo Alto southerly, 4.36 miles, is to be advertised soon. The third and connecting section is to come up early next year.

The newly completed section, with its diagonal realignment eliminating two right-angle turns, is a fine piece of road, the whole section being a striking example of modern highway standards as applied to valley roads.

SHASTA AND TRINITY COUNTIES

A crushing plant set up on the Shasta County end of the contract on the Trinity Lateral awarded to A. Milne, has completed its run and has been closed down. The other crushing plant, located in Grass Valley Creek in Trinity County, is producing rock in a very satisfactory manner and the contract is progressing rapidly.

SISKIYOU COUNTY

The first 10-foot strip of pavement throughout the whole length of the job on the Shasta River to Gazelle contract, T. M. Morgan Paving Company, was completed on October 18 and the contractor has now returned to the southerly end of the job to begin laying the second strip. It is estimated that the paving work will be completed about the first of December and that we will be able to turn the new pavement over to the traffic about Christmas time.

Paving work on the contract at Spring Hill, Mathews Construction Company, contractors, will be started on this contract on October 23 and it is estimated will be completed before the end of November.

TEHAMA COUNTY

A contract has just been awarded to A. F. Giddings of Sacramento for gravel surfacing and screenings for stockpiles on the Red Bluff-Susanville Lateral from Paynes Creek to Morgan Springs. The contractor is assembling his machinery and getting it ready to ship to the work. Nothing has been done on the ground as yet. This reinforcing and stockpiling of screenings is preparatory to placing an armor coat for our next season.

TULARE COUNTY

The Valley Paving Company is well along with the grading and culvert work and have started laying headers on their contract on the Golden State Highway between Pixley and Delano. The completed job will be a 20-foot asphaltic concrete resurface. H. B. La Forge is resident engineer on this contract.

Members of the state highway patrol force found more than a thousand violations of the traffic laws in less than a month. Is it any wonder that cars fall off cliffs, run into trees, get into fights with locomotives, and otherwise misbehave?—*Baudette Region.*

Record of Bids and Awards

HIGHWAY BID OPENINGS FROM SEPTEMBER 25 TO OCTOBER 21

CALAVERAS COUNTY—Between 2 and 4 miles south of Mokelumne Hill, 2.2 miles to be surfaced with screened gravel. Dist. X, Rt. 65, Sec. A. M. J. Bevanda, Stockton, \$9,954; A. V. Alder, Sacramento, \$8,485; Robt. Heaney, Hayward, \$6,628. Contract awarded to Adams Co., Angels Camp, \$5,028.

COLUSA COUNTY—For widening existing roadbed to 26 feet, about 6.9 miles. Dist. III, Rt. 15, Sec. B. Contract awarded to C. R. Merrill, Williams, \$11,251.68.

DEL NORTE COUNTY—Between Elk Valley and 1½ miles south of Smith River, portions to be drained. Dist. I, Rt. 1, Sec. C. L. C. Seidel, Oakland, \$16,346.24.

EL DORADO COUNTY—3.8 miles to be surfaced with untreated crushed gravel or stone. Dist. III, Rt. 65, Sec. C. Tieslau Bros., Berkeley, \$14,000; Montfort & Armstrong, Sacramento, \$18,000; W. S. Biggs, El Dorado, \$14,740. Contract awarded to Hemstreet & Bell, Marysville, \$11,750.

FRESNO-MADERA COUNTIES—Removal and disposal of old Herndon Bridge. Dist. VI, Rt. 4, Secs. C and A. Contract awarded to Wm. Wilcox, Selma, \$1,800.

HUMBOLDT COUNTY—Between Fish Creek and Stephens Grove, 2.9 miles to be graded and surfaced with untreated crushed gravel or stone. Dist. I, Rt. 1, Sec. B. J. M. De Luce, Oakland, \$147,956; Jasper-Stacy Co., San Francisco, \$229,412; Kennedy-Bayless Const. Co., Oakland, \$178,646; J. E. Johnston, Stockton, \$168,832; J. F. Knapp, Oakland, \$154,009; S. H. Palmer Co., San Francisco, \$190,022; Ariss-Knapp Co., Oakland, \$187,195; Wren & Greenough, Portland, Oregon, \$139,940; Mercer-Fraser Co., Eureka, \$177,362; Guy F. Atkinson Co., San Francisco, \$179,585; D. McDonald, Sacramento, \$178,001; W. H. Hauser, Oakland, \$143,010; C. R. Johnson, Portland, Oregon, \$177,894. Contract awarded to E. C. Coats, Sacramento, \$130,767.60.

INYO COUNTY—Between Little Lake and Coso Junction, 3.7 miles to be graded and surfaced with oil-treated gravel or stone. Dist. IX, Rt. 23, Sec. G. A. J. Grier, Oakland, \$70,214. Contract awarded to Fred W. Nighbert, Bakersfield, \$63,297.69.

LOS ANGELES COUNTY—Between Newhall Tunnel and Newhall, 1.1 miles to be graded and paved with Portland cement concrete. Dist. VII, Rt. 4, Sec. E. H. E. Cox and Son and G. W. Kuhn Co., Los Angeles, \$76,523; George Mitchell Co., Huntington Park, \$98,179; Gibbons and Reed Co., Burbank, \$94,541; McWilliams and Ritchey, Los Angeles, \$98,437; Mutich Bros., Elsinore, \$77,511; McCray Co., Los Angeles, \$60,087; C. G. Willis & Sons, Los Angeles, \$72,698; O. A. Lindberg, Newhall, \$93,588. Contract awarded to McCray Co.

MADERA COUNTY—Across Cottonwood Creek, about 3 miles south of Madera, a reinforced concrete girder bridge. Dist. VI, Rt. 4, Sec. A. Oakland Harbor Const. Co., Oakland, \$29,697; Otto Parlier, Tulare, \$32,104; George J. Ulrich Const. Co., Modesto, \$32,737; R. B. McKenzie, Red Bluff, \$33,155; E. B. Skeels, Roseville, \$32,689; M. B.

McGowan, \$32,412; Carl H. Peterson, San Francisco, \$30,543; Limer & Allen, Merced, \$31,994. Contract awarded to Geo. G. Wood, Fresno, \$28,962.50.

MONTEREY COUNTY—At San Ardo, 1.5 miles to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Secs. H and G. C. W. Wimmer & J. F. Shepardson, Bakersfield, \$112,400; Cornwall Const. Co., Santa Barbara, \$113,184; Peninsula Paving Co., San Francisco, \$96,620; J. F. Knapp, Oakland, \$98,278; Meyer Rosenberg, San Francisco, \$113,781; Ariss-Knapp Co., Oakland, \$131,802; McCray Co., Los Angeles, \$106,548; W. A. Dantonville, Salinas, \$97,444.75; Isbell Const. Co., Fresno, \$110,089; Granite Const. Co., Watsonville, \$104,750; M. J. Bevanda, Stockton, \$98,316; Prentiss Paving Co., San Jose, \$95,947; C. T. Malcom, Walnut Creek. Contract awarded to Fredrickson & Watson Const. Co., Oakland, \$95,450.30.

MONTEREY COUNTY—23 miles north of San Simeon, constructing a timber bridge across Villa Creek. Dist. V, Rt. 56, Sec. A. C. C. Gildersleeve, Felton, \$13,899; E. D. Jarvis and Will Porter, San Luis Obispo, \$20,810; Theo. M. Maino, San Luis Obispo, \$14,939. Contract awarded to H. C. Whitty, Sanger, \$11,644.

PLACER COUNTY—Bridge across Coon Creek overflow. Dist. III, Rt. 3, Sec. B. Matt J. Bevanda, Stockton, \$9,636; R. B. McKenzie, Red Bluff, \$8,747; Peter F. Bender, North Sacramento, \$9,820. Contract awarded to C. C. Gildersleeve, Napa, \$8,738.50.

SAN BERNARDINO COUNTY—Between 1.5 miles west of Siberia and 6 miles east of Amboy, 22.4 miles to be graded and surfaced with oil-treated crushed gravel or stone. Dist. VIII, Rt. 58, Sec. J and K. P. J. Aknadzich, Los Angeles, \$535,826; V. R. Denis Const. Co., San Diego, \$411,224; Dillon and Boles, Los Angeles, \$419,135; Hodgman and MacVicar, Pasadena, \$387,749; George Herz & Co., San Bernardino, \$418,955; Allied Contractors Inc., Omaha, Nebraska, \$396,107; Isbell Construction Co., Fresno, \$460,504; S. J. Hales, Santa Ana, \$399,747; Lord and Bishop, Oroville, \$436,762; C. R. Adams, Nevada City, \$439,090; Fredrickson & Watson Const. Co., Oakland, \$439,203. Contract awarded to New Mexico Const. Co., Inc., Denver, Colorado, \$384,533.40.

SAN JOAQUIN COUNTY—Near French Camp, 2 timber trestles. Dist. X, Rt. 5, Sec. B. Fredrickson & Watson Construction Co., \$24,509; Lord and Bishop, Oroville, \$24,136; C. W. Wood, Stockton, \$24,205; Griffith-Hunter, Inc., Sacramento, \$23,977; R. B. McKenzie, Red Bluff, \$24,970; Carl Nelson, Stockton, \$24,970. Contract awarded to M. B. McGowan, \$23,543.50.

SONOMA AND MARIN COUNTIES—A reinforced concrete bridge across San Antonio Creek, 6 miles south of Petaluma. Dist. IV, Rt. 1, Secs. C and A. C. C. Gildersleeve, \$23,015; M. B. McGowan, San Francisco, \$22,599; A. T. Howe, Santa Rosa, \$25,709; Rocca & Coletti, San Rafael, \$23,556. Contract awarded to McDonald & Maggiora, Sausalito, \$20,035.

TEHAMA COUNTY—Between Butte County line and Red Bluff, furnishing and hauling and placing untreated crushed gravel surfacing. Dist. II, Rt. 3, Secs. A and D. Bechtel-Kaiser Rock Co., Oakland, \$11,645; James E. Johnson, Stockton, \$13,287. Contract awarded to Hemstreet and Bell, Marysville, \$11,137.80.

TUOLUMNE COUNTY—Between 1 mile northwest of Shaws Flat and the Columbia-Sonora Road, 1.6 miles to be surfaced with screened gravel. Dist. X, Rt. 65, Sec. A. Contract awarded to The Adams Co., Angels Camp, \$5,984.

ACCEPTANCES OF CONTRACTS

Contract of Maurer & Sons of Eureka for constructing a reinforced concrete bridge across Salmon Creek in Humboldt County on the Redwood Highway. Approximate cost \$10,900.

Contract of Webber Construction Company of Crescent City for constructing reinforced concrete bridge across Hardscrabble Creek near Adams Station in Del Norte County on the Redwood Highway. Approximate cost \$19,100.

Contract of J. E. Johnston of Stockton for constructing a graded roadbed and placing crushed rock surfacing thereon from the southerly boundary of Del Norte County to Richardson Creek. Approximate cost \$299,800.

Contract of A. Teichert & Son of Sacramento for constructing a bituminous macadam pavement between Fairville and Vineburg Junction, Sonoma County, 7.4 miles on the Ignacio-Napa-Cordelia road. Approximate cost \$86,000.

Contract of Hemstreet & Bell of Marysville for surfacing and oiling from Butte City to the Chico Road, Glenn County, on the Oroville-Willows lateral. Approximate cost \$6,000.

Contract of J. F. Collins of Stockton for construction of gravel shoulders from Bradley Crossing on to the road from Merced to Sequoia. Approximate cost \$7,600.

Contract of Bartlett & Mathews of Pasadena for constructing a graded roadbed with oil-treated crushed stone surface from Mojave to a point 7 miles south of Cinco on the Mojave-Owens Valley Highway in Kern County. Approximate cost \$98,900.

Contract of A. G. Raisch of San Francisco for constructing an asphalt concrete pavement through the San Anselmo in Marin County for about 0.6 of a mile. Approximate cost \$10,700.

Contract of D. McDonald of Sacramento for constructing a double box culvert across Meeks Creek in El Dorado County on the Placerville-Tahoe Road. Approximate cost \$10,750.

Contract of J. P. Holland, Inc., of San Francisco for constructing a graded roadbed between Drytown and Amador City on the Mother Lode Highway for about 2.8 miles in Amador County. Approximate cost \$102,000.

Contract of A. Teichert & Son, Inc., of Sacramento for constructing a graded bed and placing a bituminous macadam surface between Estrella River and the Sacramento Ranch in San Luis Obispo County on the Cholame lateral. Approximate cost \$79,100.

Contract of E. M. and Edgar Noble of Marysville for constructing a graded roadbed between a point 1 mile northwest of Shaws Flat and the Sonora-Columbia road in Tuolumne County on the Mother Lode Highway. Approximate cost \$22,600.

Contract of Lord & Bishop of Oroville for constructing a timber bridge across the Little Sur River between Carmel and Cambria in Monterey County. Approximate cost \$27,500.

Contract of Webber Construction Co. of Crescent City for placing untreated crushed rock surfacing between Richardson Creek and Klamath River in Del Norte County for about 2.2 miles. Approximate cost \$10,500.

Contract of Smith Brothers of Eureka for construction of oil-treated rock borders between Napa and Greenwood corner in Napa County for about 5.2 miles. Approximate cost \$15,300.

WATER PERMITS AND APPLICATIONS

Permits to Appropriate Water, Issued by the Department of Public Works, Division of Water Rights, During the Month of October, 1929.

CALAVERAS COUNTY—Permit 3351, Application 5982. Issued to Comanche Gold Dredging Co., Los Angeles, Oct. 16, 1929, for 2 c.f.s. from Mokelumne in Sec. 12, T. 4 N., R. 9 E., M. D. M., for mining purposes. Estimated cost \$7,500.

EL DORADO COUNTY—Permit 3338, Application 6325. Issued to U. S. Eldorado National Forest, Placerville, Sept. 30, 1929, for 5000 gallons per day from Eagle Falls Creek in Sec. 28, T. 13 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$250. (Note. Permit 3338 issued Sept. 30, 1929, was omitted from Sept. publicity list.)

EL DORADO COUNTY—Permit 3341, Application 6105. Issued to Horace M. Scales, San Francisco, Oct. 11, 1929, for 500 gallons per day from unnamed stream in Sec. 21, T. 11 N., R. 16 E., M. D. M., for domestic purposes.

EL DORADO COUNTY—Permit 3346, Application 6356. Issued to Henry A. Arvidson, et al., Placerville, Oct. 14, 1929, for 0.12 c.f.s., from unnamed spring in Sec. 12, T. 13 N., R. 10 E., M. D. M., for mining purposes. Estimated cost \$1,500.

EL DORADO COUNTY—Permit 3343, Application 6304. Issued to Cathedral Water Association, Fallen Leaf, Oct. 11, 1929, for 0.025 c.f.s. from Cathedral Springs in Sec. 15, T. 12 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$1,000.

HUMBOLDT COUNTY—Permit 3348, Application 6392. Issued to P. M. Schmoock, Scotia, Oct. 14, 1929, for 0.0167 cubic foot per second from Eel River in Sec. 31, T. 2 N., R. 1 E., H. M. for irrigation of 1.51 acres. Estimated cost \$400.

IMPERIAL COUNTY—Permit 3340, Application 6307. Issued to John Diehl, Palo Verde, Oct. 1, 1929, for 0.19 c.f.s. from unnamed lake in Sec. 22, T. 9 S., R. 21 E., S. B. M., for irrigation of 15 acres. Estimated cost \$700.

LOS ANGELES COUNTY—Permit 3342, Application 6195. Issued to Lula S. Diven, Los Angeles, Oct. 11, 1929, for 0.075 c.f.s. from a spring in Sec. 31, T. 4 N., R. 11 W., S. B. M., for domestic and irrigation of 4 acres. Estimated cost \$500.

MONO COUNTY—Permit 3347, Application 6276. Issued to Gordon McBride, Bishop, Oct. 14, 1929, for 0.0003 c.f.s. from Rock Creek in Sec. 33, T. 4 S., R. 30 E., M. D. M., for domestic use. Estimated cost \$75.

PLACER COUNTY—Permit 3349, Application 6332. Issued to Pacific Gas & Electric Company, San Francisco, Oct. 15, 1929, for 120 c.f.s. augmented flow of Bear River in Sec. 22, T. 15 N., R. 9 E., M. D. M., for power purposes. Estimated cost \$762,000.

RIVERSIDE COUNTY—Permit 3354, Application 6317. Issued to county of Riverside, Riverside, Oct. 29, 1929, for 0.02 c.f.s. from Bicknell Spring in Sec. 18, T. 6 S., R. 3 E., S. B. M., for domestic purposes. Estimated cost \$2,000.

SAN BERNARDINO COUNTY—Permit 3344, Application 6108. Issued to Department of Public Works, Division of Highways, San Bernardino, Oct. 11, 1929, for 0.15 c.f.s. from unnamed spring in Sec. 30, T. 2 N., R. 3 W., S. B. M., for proposed public recreational grounds. Estimated cost \$1,300.

SAN BERNARDINO COUNTY—Permit 3350, Application 6164. Issued to Mrs. Dorothy M. Witwer, Devore, Oct. 15, 1929, for 0.1 c.f.s. from unnamed spring in Sec. 32, T. 2 N., R. 5 W., S. B. M., for irrigation and domestic purposes on 10 acres. Estimated cost \$100.

SAN DIEGO COUNTY—Permit 3339, Application 6217. Issued to Norman E. Veazey, Aguanga, Oct. 1, 1929, for 0.025 c.f.s. from Layton Canyon in Sec. 24, T. 9 S., R. 2 E., S. B. M., for irrigation and domestic use on one acre. Estimated cost \$100.

SAN DIEGO COUNTY—Permit 3345, Application 6251. Issued to Division of Highways, Sacramento, Oct. 11, 1929, for 0.12 c.f.s. from Descanso Mountain Spring in Sec. 26, T. 15 S., R. 3 E., S. B. M., for the traveling public. Estimated cost \$100.

SISKIYOU COUNTY—Permit 3355, Application 6367. Issued to Great Northern Quicksilver Mines, Inc., San Francisco, Oct. 30, 1929, for 0.25 c.f.s. from East Fork of Empire Creek in Sec. 18, T. 47 N., R. 7 W., M. D. M., for mining purposes. Estimated cost \$8,000.

TRINITY COUNTY—Permit 3352, Application 6361. Issued to John E. Young, Ruth, Oct. 22, 1929, for 2 c.f.s. from Littlefield Creek in Sec. 31, T. 2 S., R. 8 E., H. B. M., for irrigation and domestic purposes. Estimated cost \$500.

TRINITY COUNTY—Permit 3353, Application 6280. Issued to Gus Perigot, Blue Lake, Oct. 29, 1929, for 125 c.f.s. from New River in Sec. 30, T. 6 N., R. 7 E., H. M. for mining purposes. Estimated cost \$200,000.

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

BUTTE COUNTY—Application 6449. Holly Citrus Land Company, 2020 N. Oxford Ave., Hollywood, for 1.25 c.f.s. from 2 unnamed streams tributary to Wyandotte Creek, Honcut Creek and Sacramento River to be diverted in Sec. 6, T. 18 N., R. 5 E., M. D. M., for irrigation purposes. Estimated cost \$2,500.

CALAVERAS AND SAN JOAQUIN COUNTIES—Application 6458. Ralph G. Houston and Raymond W. Miller c/o A. L. Cowell, Atty., Stockton, for 150 c.f.s. from Calaveras River tributary to San Joaquin River to be diverted in Sec. 5, T. 2 N., R. 9 E., M. D. M., for irrigation and domestic purposes.

DEL NORTE COUNTY—Application 6453. Russell Reid, c/o Geo. D. Grant, Crescent City, for 1 c.f.s. from Branch Creek tributary to High Prairie Creek to be diverted in Sec. 28, T. 14 N., R. 1 E., H. M., for irrigation and domestic purposes. Estimated cost \$200.

DEL NORTE COUNTY—Application 6453. Mrs. E. F. Raymond and Sons, c/o Austin Raymond, Crescent City, for 5 c.f.s. from Patrick's Creek tributary to Smith River (Middle Fork) to be diverted in Sec. 9, T. 17 N., R. 3 E., H. M., for power purposes. Estimated cost \$5,000.

EL DORADO COUNTY—Application 6459. Mrs. M. E. Drussell, 393 Randolph, Napa, for 200 gallons per day from unnamed spring tributary to South Fork American River to be diverted in Sec. 15, T. 11 N., R. 17 E., M. D. M., for domestic purposes. Estimated cost \$150.

INYO COUNTY—Application 6468. The Ballarat Mining Corporation, Ballarat, P. O. Box 246, Trona,

for 0.06 c.f.s. from Sunset Spring, Jack Pot Canyon, tributary to Panamint Valley Sinks to be diverted in Sec. 12, T. 22 S., R. 44 E., M. D. M., for mining and milling purposes

INYO COUNTY—Application 6466. American Potash and Chemical Corporation, Trona, for 0.0544 c.f.s. from Christmas Spring tributary to Searles Lake to be diverted in Sec. 26, T. 24 S., R. 42 E., M. D. M., for industrial, domestic and mining purposes. Estimated cost \$4,840.

INYO COUNTY—Application 6460. John H. Thorndike, c/o Chandler, Wright & Ward, Attys., Bartlett Bldg., Los Angeles, for 0.10 c.f.s. from unnamed spring tributary to Wild Rose Canyon Watershed to be diverted in Sec. 3, T. 20 S., R. 45 E., M. D. M., for irrigation and domestic purposes. Estimated cost \$2,000

MENDOCINO COUNTY—Application 6464. Thomas S. Van Fleet, 333 High St., Turlock, for 0.5 c.f.s. from West Branch of Russian River tributary to Russian River to be diverted in Lots 25, 26, 27, Calpella Fruit Land Tract No. 3, for irrigation purposes. Estimated cost \$1,000.

MERCED COUNTY—Application 6470. San Joaquin Light and Power Corporation, c/o J. W. Jourdan, Dist. Engr., Fresno, for 1750 c.f.s. from Merced River tributary to San Joaquin River to be diverted in Sec. 4, T. 5 S., R. 15 E., M. D. M., for power purposes. Estimated cost \$400,000.

MONO COUNTY—Application 6463. Telge E. Hardy, Coleville, for 1 c.f.s. from four small springs tributary to no stream to be diverted in Sec. 12, T. 8 N., R. 22 E., M. D. M., for domestic and irrigation purpose. Estimated cost \$3,000.

PLACER AND NEVADA COUNTIES—Application 6465. Bear River Water & Power Company, c/o Dr. J. L. Rollins, Colfax, 110,000 acre-feet per annum from Bear River and its tributaries tributary to Feather River to be diverted in Secs. 27 and 22, T. 15 N., R. 9 E., M. D. M., for power purposes. Estimated cost \$2,500,000.

PLUMAS COUNTY—Application 6469. Henry Hollye, Twain, for 0.025 c.f.s. from unnamed spring tributary to East Branch of North Fork of Feather River to be diverted in Sec. 21, T. 25 N., R. 8 E., M. D. M., for domestic and irrigation purposes. Estimated cost \$200.

RIVERSIDE COUNTY—Application 6462. Motor Transit Terminal Corporation, 220 E. Market St., Los Angeles, for 1 c.f.s. from a series of ponds and swamps, unnamed, tributary to Santa Ana River to be diverted in Sec. 31, T. 2 S., R. 6 W., S. B. M., for irrigation and recreational purposes.

SAN BERNARDINO COUNTY—Application 6455. Geo. R. Hicks, 527 3d St., Banning, for 2.5 c.f.s. from Upper Little Morongo Creek tributary to Mission Creek to be diverted in Sec. 2, T. 1 S., R. 4 E., S. B. M., for irrigation and domestic purposes. Estimated cost \$200.

STANISLAUS COUNTY—Application 6467. Alexander J. Silveira, c/o Brown & Chamberlain, Attys., Modesto, for 0.5 c.f.s. from San Joaquin River tributary to Suisun Bay to be diverted in Sec. 8, T. 6 S., R. 9 E., M. D. M., for irrigation purposes.

SUTTER COUNTY—Application 6451. James R. Young, Cranmore, for 1.94 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 14, T. 13 N., R. 1 E., M. D. M., for irrigation purposes. Estimated cost \$5,000.

SUTTER COUNTY—Application 6457. E. H. Christenson & Son, Route 3, Yuba City, for 10.96

c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 28, T. 13 N., R. 3 E., M. D. M., for irrigation purposes. Estimated cost \$6,000.

SUTTER COUNTY—Application 6454. Austin Kramer, Knights Landing, for 1.30 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 29, T. 12 N., R. 2 E., M. D. M., for irrigation purposes. Estimated cost \$5,000.

VENTURA COUNTY—Application 6452. Reginaldo Ruiz, Ojai, for 300 gallons per day from 2 unnamed springs tributary to Sespe Creek to be diverted in Secs. 6 and 7, T. 6 N., R. 23 W., S. B. M., for domestic purposes. Estimated cost \$1,000.

YOLO COUNTY—Application 6450. Mrs. Annie Kirkup, Knights Landing, for 9.18 c.f.s. from Sacramento River tributary to Suisun Bay to be diverted in Sec. 23, T. 13 N., R. 1 E., M. D. M., for irrigation purposes. Estimated cost \$5,000.

YOLO COUNTY—Application 6461. Don McKinney, Esparto, for 200,000 acre-feet per annum from Cache Creek tributary to Sacramento River to be diverted in Sec. 5, T. 10 N., R. 2 W., M. D. M., for industrial purposes. Estimated cost \$12,000,000.

AWARDS OF CONTRACT DIVISION OF ARCHITECTURE

PACIFIC COLONY at Spadra—For furnishing and installing concrete pipe drains. Awarded to Fleming Construction Company of Pomona; price \$8,920.

SONOMA STATE HOME at Eldridge—For general work on ward building. Awarded to C. H. Dodd of Stockton; price \$37,850.

For plumbing and heating work on ward building. Awarded to Jos. C. Black of Stockton; price \$7,600.

For electrical work on ward building. Awarded to Latourette-Fical Company of Sacramento; price \$1,080.

VETERANS HOME, Yountville—For employees cottages. Awarded to the Minton Company of Mountain View; price \$11,527.

RESTORATION OF STOCKADE at Fort Ross, Sonoma County. Awarded to J. M. Eckert of Duncan Mills; price \$1,498.

GATE LODGE at Tahoe Public Camp Ground near Tahoe City. Awarded to N. R. Mayfield of Tahoe City; price \$2,395.

If your nose is close to the grindstone rough,
And you hold it down there long enough,
In time you'll say there's no such thing
As brooks that babble and birds that sing;
These three will all your world compose—
Just you, the stone, and your darned old nose.

The Motorist's Prayer

Teach us to drive through life without skidding
into other people's business. Give us chains and pre-
serve our brake linings before we go too far. Help
us to hear the knocks in our own motors, but keep our
ears closed to the grinding of other people's gears.
Keep alcohol out of our radiators and stomachs. Ab-
solve us from the mania of trying to pass others who
are going well and fast enough. Above all, open our
eyes to guiding signals, our ears to warning bells,
and teach us to keep one foot on the brake.—*National
News.*

STATE OF CALIFORNIA
Department of Public Works

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CORNING DE SAULES.....Deputy Director

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DIVISION OF CONTRACTS AND RIGHTS OF WAY

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DIVISION OF PORTS

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

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



CALIFORNIA STATE PRINTING OFFICE
 SACRAMENTO, 1929.