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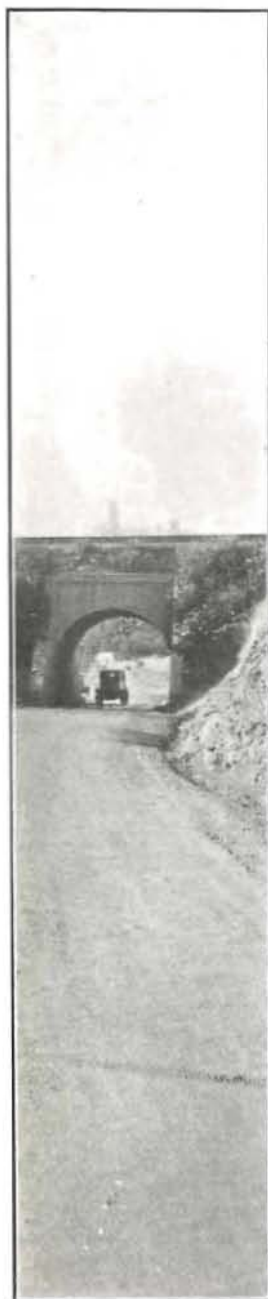


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Mr. Average Motorist, What Does State Highway System Cost You?

GOOD ROADS do not come high to the individual motorist in California. This is according to an article contained in the July issue of *AMERICAN HIGHWAYS*, in which a comparison is made of the cost to the individual motorist in the various states of automobile license and gasoline tax fees.

The figures are complete for the calendar year of 1928. They reveal some interesting facts.

California in that year ranked second among the states of the Union in the number of automobiles and trucks registered. The number was 1,799,880. Bearing this in mind it is interesting to note that the state ranked twelfth in auto license fees collected, receipts from this source totaling \$9,292,301.

The average motor license per car in California in 1928 was \$5.16. California ranked the lowest in the nation, in this imposition being listed as forty-eighth among the states. Arizona, with an average motor license fee of \$5.88, ranked next to California.

In its revenue from gasoline taxes, California topped the Union as far as total collections are concerned. First in total collections, however, it stood twenty-first among the states in the average gasoline tax imposed per motor vehicle. Total collections in 1928 in California from gasoline taxes were \$29,566,769, and the average gasoline tax per motor vehicle was \$16.42.

In the combined average of motor license and gasoline tax impositions, California ranked fortieth among the states. This combined average was \$21.58 per car. The only states with lower direct taxes on the motorist were: Indiana, \$20.54; Kansas, \$20.20; Nebraska, \$20.18; Colorado, \$20.04; Massachusetts, \$19.16 (no gasoline tax); North Dakota,

\$18.74; New York, \$16.46 (no gasoline tax); Illinois, \$10.31 (no gasoline tax).

A comparison of California collections with average collections for the United States is of interest. The figures are:

<i>California</i>	
Average motor license per vehicle.....	\$5 16
Average gasoline tax per motor vehicle.....	16 42
Average total	\$21 58

<i>Average per state for United States</i>	
Average motor license per vehicle	\$13 82
Average gasoline tax per motor vehicle	16 53
Average total.....	\$30 45

It is the opinion of those who are now in charge of the administration of state highway affairs in California that the existing system of securing highway income is sufficient to care for the present needs of our state highways

and of those that can be reasonably anticipated for the future, PROVIDED that expenditures continued to be made as they are made now, viz:

By budgeting funds in advance of their expenditure;
By orderly disbursement of highway income in accordance with carefully considered programs covering a period of years;

By progressive development of pavement types so that present improvements can be incorporated in future betterments without serious loss of the original investments.

If this policy continues to govern highway expenditures, California in the future should enjoy the advantage that it now possesses, namely, A VERY COMPLETE HIGHWAY SERVICE AT A RELATIVELY LOW COST.

While this is true, it must also be remembered that the adequacy of road income is determined by the necessity of traffic requirements.

(Continued on page 18.)

How much do the state highways of California cost you?

Are highway costs low or high as compared with similar costs in other states?

American Highways, in its last issue compiled statistics showing the relative cost to the average individual motorist of the state highway systems in the different states of the Union. This article gives the facts cited there concerning California's state highway costs. It should be noted that American Highways is the official journal of the American Association of State Highway Officials.

Two Governors Join in Bridge Dedication

THE LATEST member of California's state highway bridge family was officially dedicated on Saturday, June 22, when the Hiouchi (Blue Water) bridge over the Smith River on the Redwood Highway in Del Norte County was thrown open to travel.

The occasion was notable inasmuch as it marked the completion of original construction throughout the length of the Redwood Highway, one of the great recreational highways of America.

Recognition of the importance of the completion of the bridge to the Pacific coast states was given by the presence at the dedication ceremonies of Governor C. C. Young of California, Governor Patterson of Oregon, and highway officials of California, Oregon and Washington.

Added interest was given to the completion of this bridge by the fact that just 100 years ago this same territory was explored by Jedediah Smith, who it is believed, gave his name to the Smith River. The route that it took months for the Jedediah Smith party to traverse is now traveled in a few hours' time. After months of unspeakable hardships, the Smith party was massacred in Oregon, but three members of the party escaping, among them Jedediah Smith.

The name, Hiouchi bridge, was selected for the structure by Mrs. Ralph W. Bull of Eureka, wife of the chairman of the California Highway Commission, upon the suggestion of women's clubs and civic organizations of Humboldt and Del Norte counties. It is an Indian term which, translated, means "Blue Water" and was applied to the Smith River because of the deep blue of the water of that stream.

The bridge is a through cantilever steel truss structures, with a main span of 380 feet and two anchor spans of 114 feet, making a total length of 608 feet. The roadway is 24 feet wide.

The contract price was \$170,470.50, of

which \$149,925 was for the bridge and \$20,554.50 was for approach grading and culverts.

The floor of the bridge is 58 feet above low water. The bottoms of piers are approximately 20 feet below low water founded on rock. The total height from bottom of pier to top of steel is approximately 114 feet.

The main span was erected by cantilevering out from the anchor arms and piers on each side of the river and so accurately was the designing and erection of steel work carried out that an adjustment of one-fourth inch was all that was necessary to drive the connecting rivets when the two arms met over the center of the river.

The contract was awarded April 17, 1928, and the contract date for completion was July 6, 1929. It was built by Parker-Schram Co.

The following account of the dedication ceremonies taken from the columns of the Humboldt Times of June 23d will be of interest:

Californians, Oregonians, Washingtonians, and residents of other states who attended the dedication of the Hiouchi bridge over the Smith river and the coast-wide highway celebration at that site yesterday, enthusiastically became willing workers for a greater and united Pacific coast as they attended the impressive ceremonies which symbolized the breaking

down of the last barrier on the Redwood Highway. More than a thousand persons, gathered from all parts of the United States and including the governors of two states and many other notables, assembled at the Hiouchi Bridge at noon yesterday and rejoiced at the completion of the last major project needed to make the Redwood Highway a first-class route from end to end.

BARRIER BROKEN

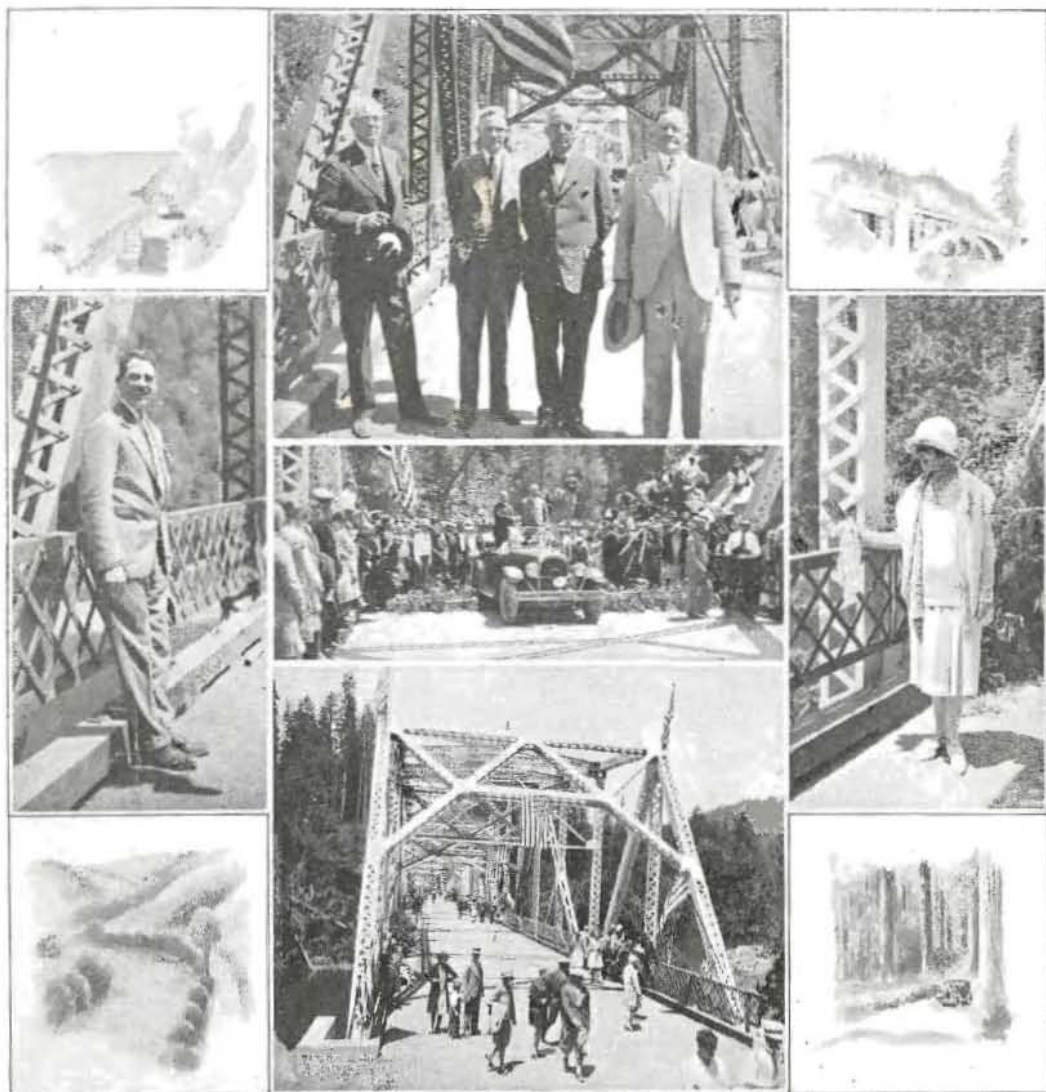
Following a short program of talks, the breaking down of the last barrier was symbolized by Governor C. C. Young of California and Governor I. L. Patterson of Oregon, who clasped hands and pledged cooperation between the two states as their automobile slowly broke through a barrier of greenery and ribbons strung across the bridge. The ceremony was completed by Mrs. Berenice Bull, wife of Ralph W. Bull, chairman of the State Highway Commission, who christened the bridge "Hiouchi," meaning "deep blue water," as she broke a bottle of Smith River water over the railing of the new structure.



Governors Young and Patterson.



Hiouchi Bridge Dedication Scenes



The pictures: Upper view, Highway Commissioners on the Hiouchi Bridge; left to right—J. P. Baumgartner, M. B. Harris, F. S. Moody and Ralph W. Bull. Center view—Governor Young of California and Governor Patterson of Oregon, formally opening the bridge. Lower view—The bridge itself. On the left is a photo of Director B. B. Meek, taken on the bridge, and on the right is the picture of Mrs. Ralph W. Bull, wife of the chairman of the Highway Commission, as she christened the bridge "Hiouchi" (Blue Water) with a bottle of water taken from the Smith River.

Bert B. Meek, State Director of Public Works, presided at the program.

"The completion of the Hiouchi Bridge marks the beginning of the end of Del Norte County's transportation problems," Thomas Peacock, Chairman of the Board of Supervisors of Del Norte County, informed those who had gathered at the bridge in his address of welcome.

Peacock also paid a glowing tribute to Ralph Bull and the other members of the highway commission.

"The dedication of the Hiouchi Bridge symbolized the elimination of the last stretch of the old one-way road on the Redwood Highway," Clyde Edmondson, Manager of the Redwood Empire Association and the next speaker, asserted.

Edmondson predicted a great and immediate increase in travel over the Redwood Highway and ex-

pressed the appreciation of the Redwood Empire Association for the work of Governor C. C. Young, Bert B. Meek, Ralph Bull and the Highway Commission in making possible the celebration.

Admiration for the beauty of the scenery through which the Redwood Highway runs, and congratulations on the opening of the Hiouchi Bridge were expressed by Dr. L. I. Hewes, Deputy Chief Engineer of the United States Bureau of Public Roads.

Dr. Hewes also outlined the plan of federal aid for state roads, explaining that the federal road system now embraces 180,000 miles of highway upon which has been spent nearly a billion dollars.

ENTIRE NATION BENEFITS

"Sometimes I wonder whether we are aiding the states or whether the states are aiding the United States when we provide federal aid for roads," Dr. Hewes commented, "for the entire country benefits through good highways.

"Possibly the completion of the Hiouchi Bridge influenced in some degree the decision of the Oregon State Highway Commission to make an announcement this week in Gold Bluff and Marshfield that we are preparing to build at once a bridge over the Rogue river on the Roosevelt Highway," H. B. Van Duzer, Chairman of the Oregon Highway Commission, told those gathered at the Hiouchi Bridge yesterday. His announcement was greeted by enthusiastic applause.

Judge Robert W. Sawyer and C. E. Gates, members of the Oregon State Highway Commission, also were introduced and spoke briefly.

"At last we're on the map." So did Edward Morris, President of the Redwood Empire Association, express his pleasure at the dedication of the Hiouchi Bridge and the completion of the Redwood Highway. Morris also expressed the thanks of the association for the work of Governor Young and the Highway Commission in making possible the removal of the last barrier.

In introducing Governor I. L. Patterson of Oregon, Bert B. Meek, Director of Public Works, warned the governor that California soon will have a couple of highways in this section that will make Oregon look to her laurels, in spite of the reputation for fine roads enjoyed by the northern commonwealth.

STATE LINES OBLITERATED

"Highways have obliterated state lines," Governor Patterson asserted. He called attention to the thousands of Oregon cars on California roads every year and to an equal number of California cars using Oregon highways, urging that the entire Pacific coast cooperate for the benefit of all.

The story of the discovery of the Smith River, on June 16, 1928, by Jedediah Strong Smith, also was related by Governor Patterson. One hundred and one years ago it took Smith a month to go from the Smith River in California, to the Umpqua River in Oregon, he pointed out. Nowadays, thanks to our fine highways, the distance can be covered in a few hours.

Governor Patterson also extended an invitation to all present to attend the dedication of the new bridge over the Rogue River, on the Roosevelt Highway, "within the next two years."

GLOWING TRIBUTE TO GOVERNOR YOUNG

In introducing Governor C. C. Young as the last speaker on the program, Meek paid a glowing tribute to the chief executive of the state as the man responsible for the completion of the Redwood Highway, through his efforts in obtaining the additional one cent gas tax for new construction work. He also characterized the governor as largely responsible for the removal

of the toll bridge menace to California highways as the result of a recent bill signed by Governor Young. "Highways bring wealth and education to the people," Meek concluded, "and California highways are not imposing a burden on posterity."

CALIFORNIA TO HAVE HIGHWAYS SECOND TO NONE

"California is going to have a network of highways second to none in the world," Governor Young assured his audience. He had considerable praise also for the work of Meek and the members of the Highway Commission.

Congratulations were extended by California's governor to Oregon's chief executive on the splendid pioneering work done by Oregon in the establishing of good highways.

The occasion of the dedication of the Hiouchi Bridge was a momentous one, Governor Young assured his listeners, because it signified the opening of a great new and beautiful territory. The Redwood Highway will become known all over the world, he predicted, and will aid in cementing a greater union between all parts of California and the Pacific coast.

The impressive ceremonies were held in a sort of natural amphitheater at the north end of the magnificent bridge. The weather was perfect with the blue sky above rivaling the deep blue water of the river in color while a golden sun beat down upon the celebrators.

Old Glory, nestling between two trees behind the speakers' sign, added the final touch of color to the beauty of the river, the sky, the forest and the mountains.

Among the more than a thousand participants in the celebration were, in addition to the two governors, state officials from Oregon and California, county supervisors and city officials from all parts of the Pacific coast, members of a party of metropolitan newspaper editors on an educational tour of the Redwood Empire, a group of San Francisco supervisors and their party, a party of distinguished foreign journalists on a friendship tour of the United States, chamber of commerce and Redwood Empire officials, Redwood Empire caravaners who will head northward from Grants Pass this morning, citizens of Crescent City en masse and hundreds of Del Norte, Humboldt and residents of southern Oregon.

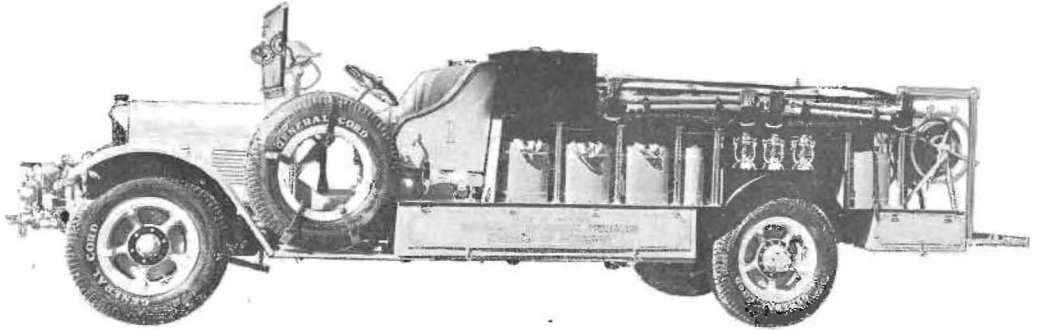
Following the dedication of the bridge the members of the official parties were guests of the Del Norte supervisors and the Crescent City Chamber of Commerce at a delicious chicken luncheon served in the forest at the south end of the bridge. Attractive Del Norte misses did the serving.

REDUCING NECESSITY FOR REPAIRS

Plans are under way for contracting the placing of bituminous blanket on a total of 30 miles of broken pavement at various locations along the state highway system. This will eliminate the constant patching operations on some of the older pavements and will provide a better riding surface, with less interference to travel as a result of the work.

MICHIGAN—The longest road survey ever undertaken by the highway department, begun in 1927 and now nearly completed, is for a 160-mile scenic shore road in northern Michigan, from Omer to Cheyboygan.

Fire Engines for Field and Forest



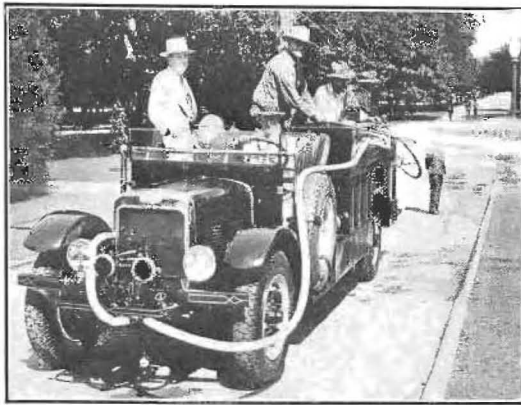
THE NEW FIRE ENGINE.

THE ABOVE is a picture of one of Fox fire trucks designed and constructed at Headquarters Shop in Sacramento for the Division of Forestry.

These trucks are equipped especially for combating forest, grain and grass fires, although they can be used for any rural protection.

The apparatus is built on a two-ton truck chassis with compound transmission governed at a speed of 40 miles per hour. They carry a supply of 225 gallons of water in the truck tank. They also carry ten knapsack type pumps each having a five-gallon water capacity.

The truck is equipped with a high pressure fire pump driven by direct connection to the engine crankshaft through a clutch at the front end. The pump can be connected to city fire hydrants or water can be pumped from



The fire engine in action; Equipment Engineer R. H. Stainaker standing in front with Shop Superintendent Frank E. Burnside at the wheel.

streams, wells or any available supply. Four lines of hose can be used from each truck.

The hand equipment consists of shovels, brooms, rakes, hoes, axes, saws, sledges, falling wedges, and crow bars.

The general equipment consists of 2200 feet of hose of different sizes, six lanterns, field cooking kitchen for fifty men including plates, knives, forks and spoons, and cooking utensils.

Provision has been made for carrying seven men on each truck conveniently, although more can be carried when necessary.

The trucks are being distributed to different districts of the state by the Division of Forestry, and are manned by state fire wardens.

The first truck was delivered July 2. The truck left Sacramento early on the morning of July 3, for a 180-mile run on its first fire, then burning at O'Neals in Madera County. When the truck arrived at the fire approximately 100,000 acres had been burned. This included grain fields, grazing land and brush, also two good sized wooden bridges. The fire was brought under control in about four hours after the truck arrived by the fire fighting crew and truck under the supervision of State Forest Ranger Wood.

At the time the truck arrived the fire was threatening valuable grain fields, also a large area of grazing land. At one time the fire jumped the line and was making good headway into a section of grazing land but due to the timely arrival of the truck, the blaze was extinguished in short order.

The truck was used on patrol duty all night, July 3, extinguishing small fires still burning, such as stumps, brush, et cetera, using the water in the truck tank and pumping from wells.

(Continued on page 25.)

Magnificent Highway Is Formally Opened



As the camera caught the scene when Governor Young opened the new highway.

A MID THE plaudits of thousands of cheering spectators, Governor C. C. Young formally opened the Santa Monica-Oxnard state highway to travel on Saturday, June 29.

The dedication of the highway with the long and colorful caravan of automobiles, led by a low flying Blimp, was an eventful day in state highway history. Widespread publicity was given to the dedication in the press throughout Southern California.

The magnificent new highway, its scenic setting along the sea, and the beaches and the cliffs that adorn it won the commendation of all both for the vision of those who had planned the highway and the genius of those who had built it.

GLAMOR OF HISTORIC PAST

To this was added the glamor of a most unusual and unique historic setting. This was well depicted by Beatrice E. Clark, writing in the *Pacific Palisadian*. In part the article follows:

This wonderland of the western sea first took its place in the known world on the seventh of October, 1542, when Juan Roderiguez Cabrillo, in quest of the fabled Strait of Anian and a direct route from Seville to the glamorous east; sailing in badly built, cockleshell boats, the *Sau Salvadore* and *Victoria*, manned with conscript crews; rounded a bold, rocky headline on the newly-named California coast. The beautiful sun-kissed crescent bay into which they sailed was the Bay of Santa Monica, which Cabrillo, seeing the smoke plumes ceaselessly rising from temescals of the Indians, named Smoky Bay. Linking the present with that far

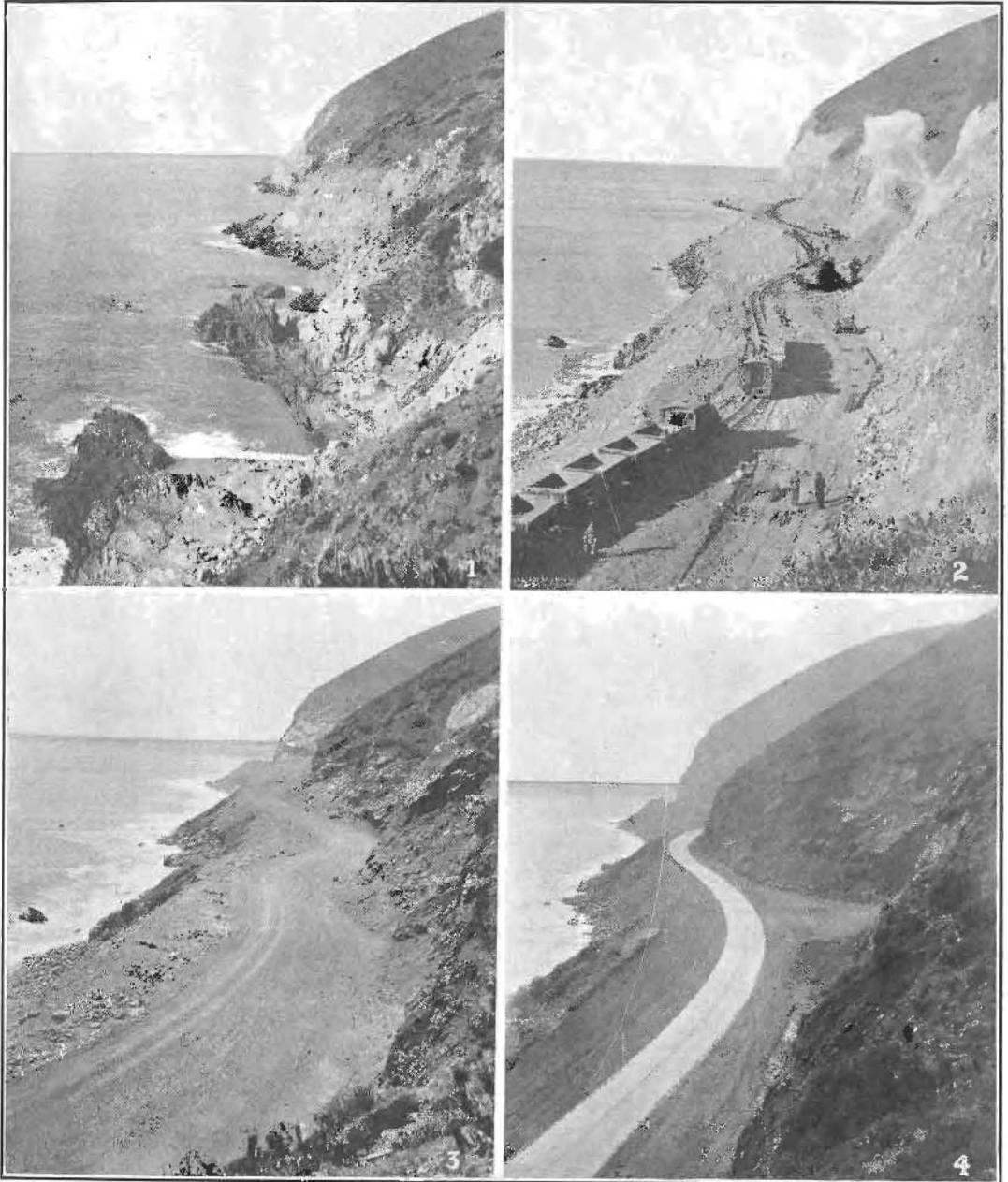
NEW TRAVEL RECORD IS MADE ON NEW HIGHWAY

A new record for state highway travel was established in California on July 14th on the Santa Monica-Oxnard Highway. This road was thrown open to travel throughout its length on June 29th. A 16-hour count of travel passing over this road in both directions on July 14th, taken at Santa Monica Canyon, showed a total of 53,303 vehicles. On July 4, 1928, the portion of the road that had then been opened to travel showed a total of 43,173 vehicles, the count being taken at the same station.

An interesting feature revealed by the 1929 count was that with more than 10,000 more vehicles passing over the road than was the case on July 4, 1928, there was less actual delay and congestion of traffic this year, than a year ago. This was due to widening and oiling shoulders adjacent to the concrete pavement.

distant past are the heaps of arrowheads, vessels of stone and the bones of the Indians torn out by the hungry mouths of the steam shovels tearing down hillsides to make way for modern roadways.

The point rounded by Cabrillo as he sailed from the south was named centuries later by the English explorer, George Vancouver, on his second visit to the coast of California in 1793. Greatly admiring two Franciscan friars of the Mission San Buenaventura he named the first headland Point Vincenti and the north-

The Growth of the Highway

The pictures: (1) View showing the location of the highway before construction; (2) the same scene during construction; 3) as it appeared after completion of grading; (4) again after completion of grading.

ern outpost of the bay, 17 miles northwest, he called Point Dume. Stretching inland and north and south of Point Dume, lies the great tract of virgin territory in the same state as when Don Jose Tapia was granted a deed to the land by a Mexican governor in 1805. Known as the Topango Malibu Seguit, it included in its wide expanse three great canyons, Topango, Secas and Malibu. In 1824, so states the historian Luther Ingersoll, the rancho passed into the hands of Tapia's heirs, next changing hands to settle an unpaid grocery bill. Don Mateo Keller, who came into possession of the property through a tax sale, erected a large ranch house near the entrance of Malibu Canyon where he lived with his family, his son Henry later inheriting the land. He sold it in 1891 to the late Frederick Hastings Rindge.

DIFFICULTIES AND OBSTACLES CONQUERED

A picture of the difficulties encountered and the obstacles conquered in building the road is painted by J. C. More, office engineer in District Seven, with headquarters in Los Angeles. Writing in the same paper, Mr. More says:

The day labor job at Point Magu was the most difficult piece of work in this district. The solid rock bluffs to the water's edge made it necessary for surveyors and other workmen to be suspended by ropes like Alpine climbers, and the entire roadway had to be blasted out. The seven miles of heaviest work in this stretch cost nearly \$1,000,000.

The fact that there are no shipping points between Santa Monica and Oxnard made a long, expensive haul though no other difficulties of transportation were encountered. The shortage of water for construction work made it necessary for the state to lay a pipe line from the Los Angeles city limits at Castellammare to Nicholas Canyon, a distance of 21½ miles, carrying the city water for use at that point. Landslides also presented problems difficult to meet, one slide from the Ventura county bluff six weeks ago sending 100,000 yards of earth across the highway. The removal of this slide required a great amount of labor and engineering skill.

The coast formation is such that a special form of protection had to be evolved, one which it is believed, has never been used anywhere else. Owing to the impossibility of using the usual procedure in building seawalls where the waves beat upon the face of the rock cliffs, the system of concrete cells was devised whereby huge rectangular, hollow blocks of concrete, weighing three tons each were lowered into the ocean by cranes and when in position were filled with concrete, thus making a base for the sea wall. The great problem all along the coast line was to keep the fills in place and thousands of dollars were spent in building rip-rap and groins from Santa Monica on up.

GOVERNOR YOUNG SPEAKS

The importance of the highway to California was stressed by Governor Young in his dedicatory remarks. Speaking at a point on the highway midway between Santa Monica and Oxnard, Governor Young said in part:

Just stand by this road tomorrow and watch the traffic that it serves. Your hearts will swell with pride that your dream of 20 years has come true. This road is going to play a tremendous part in the development of this wonderful country.

We have already put in nearly \$5,000,000 in it and we find that it is only half wide enough. In a few years you will see it a highway twice as broad, carrying the heaviest traffic in the country between this point and the beautiful beaches about Los Angeles.

We have been enabled to do this by budgeting our highway expenditures, and building in a systematic order, as we are attempting to operate all departments of the state government.

BELIEVES IN THE PEOPLE

I was told when we started the system of budgeting the highway work and announcing our programs two years in advance that it was a serious political mistake; that communities that did not get what they were asking for would make us trouble. I said I did not believe it; that I believed the people of California wanted their money spent in a businesslike manner and that the day of political highway construction in California was past.

We began to announce our two-year program and we were commended instead of criticised, because we selected the work that was needed most and we divided the funds as equitably between all sections of the state as was possible.

It convinced me that if you go to the people of California, cards on the table, face up, and tell them what you are doing, if you are right they are going to be with you 100 per cent.

DIRECTOR MEEK'S ADDRESS

Mr. Meek, Director of the Department of Public Works, paid tribute to the foresight of the present State Highway Commission in selecting the Oxnard-Santa Monica highway for completion and in providing the funds, and also gave praise to District Engineer S. W. Cortelyou, who had immediate supervision of the work, and said that "California's splendid highway system is being built under the enthusiastic supervision of Governor Young and his highway commission."

The members of the state highway commission are here. That is the best indication of the interest the state is taking in your highways. This road was started ten years ago. It was through the gasoline tax that you gave us that we were enabled to finish it for you after we came into office three years ago.

With the gas tax, we can plan years ahead for our work and we can carry forward construction in an orderly manner and at a saving in cost to the taxpayers of California. Under our budget system, we are not only constructing highways already ordered or under way, but we can plan years ahead for the needs of the state in new highways and wider highways where the traffic requires it.

We used \$1,200,000 to complete the last 23-mile gap of this highway. My judgment is that the 44 miles of highway between here and the city limits of Santa Monica opens the most spectacular and beautiful area in America adjacent to a large population. The people of Oxnard and Ventura County can not realize in their wildest dreams the traffic this road is going to develop. These roads create their own values and justify the tremendous investment in their construction. Continue to give us the gas tax and California will have the greatest highway system of any commonwealth in the world.

(Continued on page 27.)

Building Safety Into State Highways

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

A FEW years ago when the volume of automobile traffic was but a fractional part of what it is now, and when the automobile was a slow-moving vehicle as compared with the car of today, the necessity of actually building safety into the highway and making safety an integral part of the road was not a particularly important part of highway construction.

Today the factor of safety in road construction is as important an element in planning a road as are any of the other features considered essential in highway design.

The necessity of safety in highway design is easily understood.

THIS IS THE PROBLEM

California law permits a driver of an automobile to travel, under favorable conditions, at a rate of 58 $\frac{2}{3}$ feet a second. The automobile manufacturers and distributors have seen to it that a large portion

of the machines on the highway are capable of traveling easily at the rate of 75 or even 90 feet a second. The hand and eye and mind of man can be coordinated by education to a marvelous degree but a 3000 pound automobile, traveling at a lawful speed of nearly 60 feet a second, or 40 miles an hour, is a force to be reckoned with at any time.

Multiply this by the hundreds of thousands of cars traveling our highways, each operating on its own schedule, coming and going, backing into and crossing traffic, as desire or necessity may dictate, and you have something of the picture of the problem that confronts the men who build and maintain highways, and those who seek to control their operation.

DRIVING CONSCIENCE GROWING

It is indeed deplorable that so many traffic accidents occur. But when one considers the

millions of people who daily trust themselves to this means of travel, it is to marvel at their faith in the men who build and maintain the roads. The extent to which accidents do not happen is due not alone to the increasing manner in which safety is being built into our highways, but also to the extent of popular education on motoring rules. Discouraging as statistics may sometimes appear the driving conscience of the thousands of motorists who

make up highway traffic each year is being awakened to their responsibility. Education will be an ever-continuing part of the effort to reduce the accident hazard.

The men in executive control of highway work in California are seeking to justify the confidence of motorists by a forward looking policy, which will make safety an integral part of our highway system. We believe that there is no more ambitious program for safety design in highway construction

under way anywhere in the United States than that in California. The program does not stop with building safe highways, but extends to the maintenance and operation of highways, the control of traffic, and through cooperation with other agencies, to the education of the motoring public in the rules that they must observe and the practices that must follow, to protect themselves and their fellow travelers.

This article, however, will consider simply those safety measures which are considered as a part of the routine of design, location, construction and upkeep of our state highways.

SAFETY IN WIDTH

The adoption of the present financing program, based upon the one-cent gasoline tax for new construction, made possible with Governor Young's support, permitted a proper standard of design for construction. Proper

"The Division of Highways desires to cooperate with other state agencies, with the automobile associations and with all other organizations interested in safety measures to the end that the public may use their highways in SAFETY. Particularly it bespeaks the assistance and the cooperation of the individual motorist. The reckless motorist can make the safest highway dangerous; and conversely, the careful motorist will ride in safety over a highway that, judged by technical standards, might be considered unsafe.

"The best that the Division of Highways can do is to make the highway safe for the sane motorist. We are spending millions of dollars in doing this. But these expenditures and the months of effort spent in planning and building our highways can all be undone in the fraction of a second's time by the careless driver. I appeal to the individual motorist to do his part in this great work of making our highways safe by seeing to it that he drives in a safe and sane manner, with due consideration for the rights and the safety of other users of the highway."

* Reprinted from July issue of Motorland, official publication of the California State Automobile Association.

width of pavement is essential to safety. A turnpike road section capable of progressive development has been approved. On this section the minimum pavement width is 20 feet, made up of two 10-foot traffic lanes. The minimum width of roadway is 36 feet to provide an 8-foot shoulder on either side so that the motorist may park his machine entirely clear of the pavement. In general, a minimum of 100-foot width right of way is secured so that deep borrow pits may be eliminated. Fill slopes are kept flat so that if a vehicle is forced off the shoulder danger will be minimized. The planting of trees and placing of public utility lines are considered in their proper relation to safety.

GRADES AND CURVES

The maximum grade is fixed at 6 per cent and minimum curvature at 300-foot radius. Rolling grades, with sharp vertical curves of the sort which hide the oncoming car, are eliminated. Curves of less than 2000-foot radius are superelevated, and the crown in pavements is so slight as to be scarcely perceptible to a motorist. Bridges are designed with a roadway four feet wider than the pavement on either end so there will be no tendency for drivers to crowd toward the center as is the case on older, narrow structures. Provision is made also for future widening. Pipe culverts are extended so there is no constriction of the traveled way.

In locating a new road, consideration is given to limiting sections which will be shaded in wet or frosty weather so that the road will be as free from skidding hazard as possible. Short vertical curves and sharp curves at the foot of heavy grades are avoided. The safest alignment and least obstruction to vision is always given consideration. Many difficult problems in bridge design have been worked out in order to secure desirable alignment at approaches to such crossings.

ELIMINATING THE GRADE CROSSING

One of the outstanding planks in the highway safety program is the elimination of the railroad grade crossing, either by underpass or overpass structures, or by realignment. Twenty-six grade crossings have been eliminated in the present biennium, and the time is not far distant when the dangerous grade crossings on the state highway system will be a thing of the past.

Spectacular, however, as is the program for the abolition of the grade crossing, the fact should not be forgotten that it is only one of many features of the safety program now under way on California state highways.

Few people realize that even the best types

of pavement are, comparatively, only temporary. A surface which is safe when constructed, in a few years may become rough and uneven, causing a constant strain on vehicles and an added hazard in driving. Maintenance of a smooth pavement is therefore essential to safety.

Construction standards are at a high level. Specification requirements are primarily for the purpose of securing the most permanent, high class road of the type desired, but in holding to these standards greater safety is built into the highway. Fills are placed in rolled layers, adequate drainage is provided, and following the stage development of the surfacing, a heavy section of nonskid pavement is placed.

REBUILDING SAFER ROADS

In reconstruction work a great deal is done each year to make the highways safer. Horizontal curves are flattened and superelevated. Vertical curves are flattened. Shoulders are widened and rock placed adjacent to the narrow pavements.

Short sections of road which have proven hazardous, due to standard improvement on either end or for other reason, are being improved. Uniformity is a great aid to safety, as the average driver, who has been traveling at a high speed for a considerable distance, may not adjust himself quickly to changed conditions.

Guard rail, of 8x8 posts and of laminated rails built up from 2x8 planks, is installed on narrow grades, high fills and at brige approaches. This guard is securely set and painted white. This type of rail is a decided improvement over the old standard, not only because of greater strength, but because the splintering of the old, light rail was a distinct hazard in itself, in case of accident.

The opportunity for initiating and carrying out safety measures in the maintenance work is apparent as there is a large mileage of the older types of construction and of unimproved county roads which have been taken into the state system.

STRIPING THE TRAFFIC LANES

The painting of stripes to divide pavement into traffic lanes has been initiated and some 1400 miles are programmed for such work during the coming biennium. This line not only increases safety but adds to the traffic capacity.

"School Slow" signs are kept painted on the pavement either side of all school buildings adjacent to the highways, to protect children who must cross roadways.

(Continued on page 29.)

San Fernando Pass, Historic and Forgotten

By BEN BLOW, Field Secretary, National Automobile Club

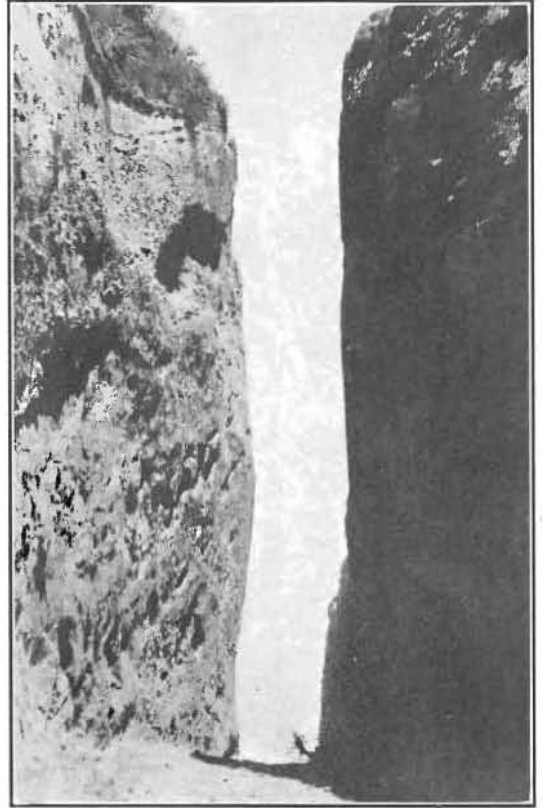
A FEW HUNDRED yards to the east of the State Highway, where traffic roars never ceasingly through the Newhall tunnel, is one of the most interesting and historical highway structures in California, the ancient San Fernando pass.

With walls that lift sheerly about 80 feet, just wide enough for one vehicle and approached from the south through a tortuous canyon over a 29 per cent grade, this old time highway entrance into southern California from the San Joaquin Valley supplied for many years the most direct access from north to south and, from the advent of the automobile until 1910 when Los Angeles County completed and opened up the Newhall tunnel for travel, early-day horseless carriages wheezed and rumbled and groaned over it mostly by mule power, for the early-day engines, one- or two-cylinder contraptions, invariably died on the hill.

Who was responsible for the San Fernando pass seems to be hidden in the unknown history of California, for neither the Los Angeles Public Library nor the State Library at Sacramento contains a single document which tells of its origin. Certain it is, however, that it was for a time a toll road. Pioneers who lived there in the old days and who still survive, gray and weather beaten, tell of a two-room adobe toll house which stood "on a little flat at the south entrance of the cut where an almond and an oak tree grew."

Today the walls of the toll house, beaten down by time into a mere outline of the old structure, may still be seen, while close at hand the oak tree flourishes still sturdy, and the almond, in the springtime, bravely blooms.

About the only mention of the San Fernando pass which California history affords, is supplied by the published diary of Bishop Kip, the first Episcopal bishop of California, who, on Monday, October 5, 1855, started on a trip from Los Angeles to Fort Tejon. Bishop Kip writes: "We left Los Angeles at 11 o'clock. Our vehicle was a large, heavy wagon, for no other is adapted to the mountain passes through which our road leads. We had hardly got out on the plains a couple of miles from Los Angeles—" between Los Angeles and the Hollywood of today—"when, in descending a gulch, part of the harness broke, the mules whirled around and we were only saved from an overturn by the snapping off



"The deep defile in the mountains," the old San Fernando Pass.

of the pole. Nothing could be done but for our driver to take a couple of mules, return to Los Angeles and have a new one made.

"After a wait of some hours we made a new setoff. We shortly passed through a chain of hills—" the Cahuenga pass—"and then again over the plains for seventeen miles. Not a living object was seen for hours, till toward evening the coyote wolves came out and we could see them loping along with their long gallop, often numbers in a troop." This was in the San Fernando Valley, where the "desert" now blossoms as a rose.

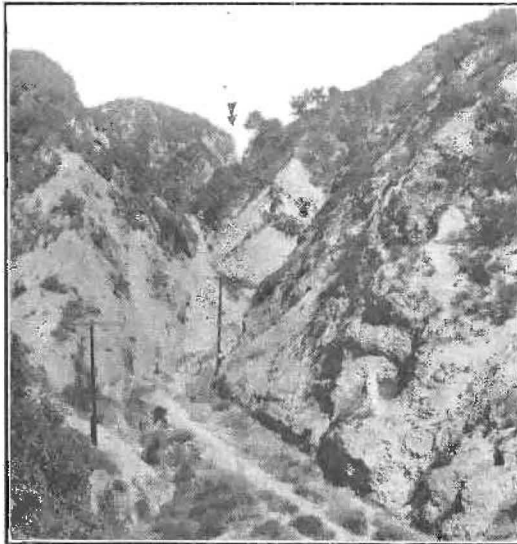
Stopping over night at the San Fernando mission Bishop Kip continues in his diary: "It was 7 o'clock before we left the mission, and, after proceeding a few miles, reached the San Fernando Pass where the road had been cut through a deep defile in the mountains. Here we had to get out and walk and the



Approach to San Fernando Pass from the south.

scenery was the wildest I have seen since I crossed the Alps. How our heavy wagon got over was a marvel to us."

With the opening of the Newhall tunnel in 1910 this "deep defile in the mountains" passed into history in so far as highway travel was concerned and remained wholly abandoned, almost forgotten, until the early-day movies found that it was an ideal location for western thrillers wherein chap elad cowboys leaped their horses across the narrow chasm or, single handed and alone, held the dark



Approach to San Fernando Pass as seen from the State Highway south of Newhall Tunnel showing a 29 per cent grade.

Highway Building Program is Driving Ahead of Schedule

All projects included in the state highway program for the biennium of July 1, 1927-June 30, 1929, have been placed under contract.

A total of \$5,000,000 of projects included in the program for the new biennium which began on July 1st of this year had been either placed under contract or were being advertised for bids prior to that date.

Minor projects involving a total of \$405,000 were transferred from the program of the 1927-1929 biennium to the present biennium because of right of way difficulties and engineering obstacles.

This is the substance of a report made by B. B. Meek, director of the Department of Public Works, to Governor Young and the members of the California Highway Commission.

The report shows that a total of \$14,461,957.15 was spent during this biennium on new

(Continued on page 30.)

depths against hordes of painted Indians or savage outlaws.

Scars on the sheer sides of the cut where this or that prop for picture filming was built into the scenery are all that remain to tell of its use in moving pictures and today, within sound of the whirl of wheels humming over one of the most heavily traveled highways of California, the San Fernando Pass is scarcely known. Passing motorists north bound on the highway and approaching the south entrance of the Newhall tunnel may briefly glimpse in passing the V shaped cut in the skyline which marks its presence and occasionally, in the springtime, there will be comment on the lonely almond tree in bloom, but rarely does anyone stop to visit the somber depths of the old time pass.

On the very edge of one of the heaviest traffic flows in the state, this "deep defile in the mountains," with its steep approach lies undisturbed. Dark in its depths save for that brief noonday moment when the sun is at zenith it seems like some deserted and violated tomb, but viewed retrospectively through the eyes of imagination it unfolds a pageant of history wherein Indians and vacqueros, ox teams and pioneers, stage coaches and 49ers trailed in review by the one- and two-cylinder horseless carriages of the early motor era, pass on into the thin perspective of a forgotten day.

Read This "Routine" Report of an Explosion on Powder Truck Along State Highway

Colfax, Cal.,
June 27, 1929.

Mr. Chas. H. Whitmore,
District Engineer,
Sacramento, California.

Dear Sir: Attached are forms R-3 in duplicate to cover the accident near Baxter's Camp today.

The details of the case, as have been gathered from several sources, are as follows:

After leaving Auburn this morning, en route to Colfax, I recall passing this truck. After stopping for a time at the Colfax maintenance site, I again passed this truck above Colfax. Traffic Officer Marvin states that he particularly noted the care with which the driver crossed the railroad tracks at Colfax.

The truck was very heavily loaded. The mechanic at the garage at the top of Alta grade noticed that the truck was in low gear, and running very hot.

The driver stopped at Mrs. McKims for lunch about 11.30 a. m. and shortly after resumed his trip. At approximately 12.10 p. m. he passed our maintenance crew who were eating lunch. They were about one-fourth mile east of "Death Curve" above Baxter's. Those who were working on the patching crew at the time were: Foreman W. M. Barnes, I. R. Gamlin, D. O. Gamlin and S. R. Gamlin.

Of interest to Mr. George R. Winslow, is the fact that had he passed this spot about one or two minutes later, he would have found himself in a bad situation.

After passing the place where the boys were eating lunch, the truck entered upon a straight stretch of about 1000 to 1500 feet. While still on this stretch, the truck was suddenly enveloped in a cloud of smoke and flame. The sound of the firing of the powder

was quite loud, although it could not rightly be termed an explosion. The entire load was scattered over a radius of about 200 feet. The truck was a mass of flames and black smoke, as was the road for some distance surrounding the truck. The cans of black powder had flashed immediately. As there was no heavy detonation, the stick dynamite did not explode, but burned where it was thrown. Of the entire load, twenty of the boxes of dynamite did not burn. These were buried near the vicinity of the Division of Highways Maintenance crew.

As soon as the truck fired, our crew rushed to the spot. The intense heat kept them back some 200 feet. Nothing was heard from the driver, so it was not known for certain if he came to his death by suffocation or concussion.

Mr. W. M. Barnes took the situation in hand,

and managed it unusually well. He placed a flagman on the west side, and attempted to get around the fire to flag oncoming traffic. Before he could get around, a Yellowway stage nosed around the curve from the east, and stopped and the driver warned traffic from that di-

rection. The stage and passengers owes its good luck to a matter of about two minutes of time.

The fire spread to the surrounding country, and burned over several acres. The ranger was soon on the job, the station being but a couple of miles to the east. Our forces had the fire under control upon his arrival.

The Pacific Telephone and Telegraph Company's main lines were soon a mass of tangled wire, and service was crippled. A company maintenance man happened to be in the second car to approach the scene after the fire. The Auburn repair crew were notified and were on the job in record time.

The accompanying article is the verbatim report of Superintendent C. H. Weeks telling of an accident which occurred on the state highway on June 27th. In this accident, R. G. Case, a truckdriver employed by an Oakland concern, lost his life, while he was transporting powder from Oakland to a construction camp near Cisco. Two or three perfunctory paragraphs in the newspapers covered the "story." We commend Superintendent Weeks' report to the press as a real "human interest" document.

Considerable trouble was encountered in handling the traveling public. After an hour of waiting, they became restless. The situation was still very dangerous, as burning dynamite was still strewn over the highway and roadsides. In clearing the road, considerable credit is due to Mr. W. M. Barnes and Mr. Glenn E. Sweeney for their carrying several boxes of *hot dynamite* from the road to a place where it could do no damage. This act should be worthy of some expression of appreciation.

Vague details of the accident reached Cisco where we were in the midst of a session of dust layer oil. This job was immediately tied up, and all men and equipment were rushed to the scene of the fire.

The patching crew had a full load of screenings on the truck at the time of the fire. This load was scattered over the burning pavement. After all burning powder was removed and the traveled way well screened, the traffic was allowed to proceed in safety. This was at about 2 o'clock.

A great deal of credit is due Foreman Barnes for the efficient manner in which he managed the whole situation. There were no traffic officers on the job until about 2 o'clock.

As the Division of Highways maintenance crew are always the first to arrive at these accidents, it is suggested that the idea might be advanced to Mr. Snook of the Division of Motor Vehicles, that one man of each of the maintenance crews be deputized to handle the traffic under just such conditions as this.

Very truly yours,

C. H. WEEKS,
Superintendent.

CONTRACTS ACCEPTED

The contract for grading and paving with Portland cement concrete 9.8 miles between El Centro and Brawley on the San Bernardino-El Centro road has been accepted. This work was done by the R. E. Hazard Contracting Company at an approximate cost of \$332,000. The work was completed a month ahead of the time specified in the contract.

The contract of George Herz and Company on the Mecca to Blythe Highway, between Hopkins Well and Black Butte in Riverside County, has also been accepted. This project involved 22.1 miles which were graded and surfaced with oil-treated crushed stone. The cost of the work was \$304,000. It was completed two months ahead of scheduled time.

The work of grading and paving with bitu-

GOVERNOR YOUNG WARNS AGAINST THROWING FIRE FROM MOVING VEHICLES

By C. C. YOUNG, Governor of California

I have requested traffic officers throughout California to rigidly enforce that section of the law that forbids the throwing of burning articles from a moving vehicle.

The strict enforcement of this provision of the law will be a very material factor in lessening fire danger along our highways.

The Division of Highways has spent large sums of money in burning the roadside along the state highway system where the fire hazard was considered particularly acute. This, however, only partially solves the problem. Great danger will always exist if fire is thrown from vehicles to light where chance or the wind may carry it. Proof of this is found in heavy losses already incurred through this source.

I would urge motorists to cooperate in this work by strict obedience to this very vital and important law. The public by a little care on the part of each individual can render unnecessary the unpleasant task of enforcing this law by means of arrest, fine and imprisonment.

We ask each motorist to police his own actions. If this is not done, do not censure the traffic officer for enforcing the law. He has received his instructions. If you will not obey the law, he must and will obey his instructions.

minous macadam on 2 miles at Bowman and Weimar in Placer County has been accepted as completed. Frederickson & Watson and Frederickson Bros., of Oakland was the contracting company. The cost of the work was \$54,500.

The contract of A. Teichert & Son, Inc., Sacramento, for grading and paving with bituminous macadam, between 1.7 miles west of Shandon and the easterly county boundary of San Luis Obispo County, a distance of about 15.4 miles, has been accepted as completed. The cost of the work was \$172,900. It was completed 11 days ahead of contract time.

The contract of H. H. Peterson, assigned to E. Paul Ford, for grading and paving with Portland cement concrete between Santa Rosa and Willowbrook in Sonoma County has been accepted as complete. The cost of the project was approximately \$430,000. The contract was completed 2½ months ahead of contract time.

ILLINOIS is to have a 3-cent gasoline tax beginning August 1. The revenue from this source is estimated at \$21,000,000 for the first year.

A Worthwhile District Organization

By L. B. REYNOLDS

THE NATURAL trend today, in both business and private life seems to be toward organization. Its purpose in the past has been to bring workmen together in a body to make working conditions better, but in later years the purpose has been broadened to include the improvement of mind and bring about business and social contact, thereby reaching the end that, in the past, was accomplished by mass strength.



L. B. Reynolds.

Today we see luncheon and social clubs or organizations finding their way into towns very small in population whereby business and professional men have their weekly "Get Togethers." At these meetings competitors are brought together on

more or less neutral ground where conditions are discussed and speakers of broader knowledge impart their learning to those not having had the opportunity to come into contact with these various subjects.

We now find that this same thought and desire has crept into the Engineering Department of District III, namely "District III Forum." The organization is not old but considerable has been accomplished since November 27, 1928, when the first meeting was held.

We can all feel deeply indebted to Mr. E. K. Guion, Office Engineer of District III, for its formation. It was upon his suggestion, during a "Get Together" meeting that the thought was brought to the attention of "The Boys." While associated with District I, Mr. Guion was responsible for the formation of a similar organization, the life of which was not long. Not to be discouraged he made the attempt again in our office, and it was readily accomplished.

Acting in the capacity of chairman at the first meeting, Mr. Guion gave the members a talk, covering the points in detail which he felt should be paramount, namely:

1. Organization.
2. Relationship between departmental heads and employees.

3. Educational.
 - a. Promotion of public speaking.
 - b. Lectures.
 - c. Short study course.

4. Development of executive ability.

The late Theodore Roosevelt is quoted as saying "Each person, as a citizen, owes a part of this time toward the development of the home, the school, the church, the community, in which he lives, and also should devote a part of his time toward the advancement of that particular occupation or profession from which he makes his living."

It can be said that we are following a part of what Colonel Roosevelt said by the formation of this organization. We are devoting a portion of our time toward the advancement of the profession from which we make our living, even though it be in a minor way.

Our organization provides a means of bringing the members together for the exchanging of ideas, the betterment of methods that to a great extent are original ideas, thus making a tiresome task more interesting, and very often such modification is the means of making a costly job less costly. At the same time, young men entering the field of engineering are given the opportunity to acquire some of the knowledge from persons having reached a point above themselves.

Much more can be accomplished through the devoting of six or seven hours a month, at which time concentration on the subjects which come into our daily work, than can be gotten by many hours of reading articles that only touch upon the topics. This is said primarily for those new in the profession.

A contact with fellow workers is gained that is hard to accomplish. Many grievances that perhaps would result in enmity are overcome by the persons involved in seeing a character brought out in the others when their minds are relaxed and not carrying the burdens of their day's work.

A feature, hard to accomplish in any way other than through an organization such as we have, is the common footing upon which the department heads have placed themselves with the employees. Several instances can be cited where employees have presented ideas for the changing of routine or system to an extent that a great amount of repetition, such as is necessary in our work, has been eliminated.

(Continued on page 31.)

Clippings, Letters and Comment

THE HIGHEST bid in the history of the state highway system was submitted in July when bids were opened for grading and paving a nine-mile section between Hayward and Niles in Alameda County.

The bid of one contractor on this job was \$170,151,298.25.

When the bid was studied, to determine the reason of its gigantic proportions, it was found that the contractor had bid \$8,240 per cubic yard on unclassified excavation. Further study revealed that he had placed the total price desired for this work in the column designated in the bid sheet for the price per cubic yard.

In view of the fact that this one bid, if accepted, would have taken all state highway money for approximately six years, the bid was forthwith rejected.

The low bid on the job was that of Hanrahan Bros. of San Francisco, whose price was \$325,305.

* * * * *

The Service Honors The Whole Division.

LITTLE things are sometimes big things. Here is a letter that speaks a volume:

Los Angeles, July 18, 1929.

State Highway Commission,
Sacramento, California,
Gentlemen:

This may be a peculiar letter, but I feel quite strongly on the subject and that you ought to know of the situation.

There is a detour just south of the work now being done on "A" street, Ontario, which crosses the Southern Pacific tracks at grade, just east of Ontario.

A young man has been employed to serve as watchman of that crossing and signed the hours of 8 a.m. to 4 p.m. I have never talked with him, and my information is from an outside source. I do not even know his name.

An eastbound S. P. passenger train is due at 4:45 p.m. This is forty-five minutes after your watchman is off duty, but there is more traffic over the detour about that time than any other portion of the day. The young man stays, therefore, until after this train has gone before he leaves.

It is altogether too seldom that an employee of the state, or, for that matter, of an individual employer, is imbued with the sense of his responsibility to the people. This is an outstanding case and I am glad to call it to your attention.

Sincerely,

(Signed) C. H. MEADOR.

Mr. Purcell Returns From Boise Conference.

C. H. PURCELL, State Highway Engineer, returned on July 15, from the annual meeting of the Western Association of State Highway Officials, held in Boise, Idaho.

The association passed a resolution asking that the U. S. government remove the limit of \$15,000 a mile now placed on federal contributions to highways in the Federal Aid system. The resolution declares that the \$15,000 limit was fixed in 1922, when construction standards were much lower than they now are. This restriction, the resolution further declares, throws an unfair burden on the state.

The Colton-Oddie bill was endorsed. Under this bill the U. S. would increase its appropriation of forest highway funds from \$7,500,000 to \$12,500,000 for each year. An appropriation of from \$3,500,000 to \$5,000,000 would also be made for roads passing through unappropriated public land, withdrawn from state taxation, excepting national forests which are otherwise provided for.

An aviation conference was held just prior to the road meeting. A resolution was passed at this former conference asking that each of the governors of the eleven western states appoint a contact man or contact board, the whole to make up an aeronautical board for the western states, to which board all interstate aviation matters would be referred. The object of this board would be to secure uniformity of legislation on interstate aviation matters and to promote more effective cooperation in these matters between the states and the U. S. Department of Commerce.

* * * * *

Highway Crews Win Commendation.

J. E. ELLIOTT, forest supervisor, has written State Highway Engineer C. H. Purcell, the following letter commending roadside fire protection, conducted in San Bernardino County by District Engineer Sullivan and his forces:

"Please permit me to congratulate your department for the excellent work being done in fireproofing the Waterman Canyon road. The work you are having done will no doubt greatly lessen the risk of fire starting in this canyon and we want you to know

that the Forest Service fully appreciates your splendid cooperation."

* * * * *

National Standowners To "Chain" Hot Dogs.

A NEW development in the roadside refreshment industry is the organization of the National Standowners' Association, a trade group, adequately financed, which proposes to introduce chain store methods to the "hot dog" stands.

* * * * *

Strong Commendation From Director Heron.

PROPOS of fire protection work, under date of July 18th, Alexander Heron, Director of Finance, wrote the following letter to Mr. B. B. Meek, Director of Public Works:

"It was my privilege yesterday to inspect and witness in operation one of the new fire trucks which are being used to stamp out fire in the forest regions. It was revelation, indeed, to see this truck in operation, and I want at this time to congratulate you and your department on the assembling of such an efficient unit. I am sure it will do much in coping with the serious situation which confronts the forest rangers from year to year."

* * * * *

Supervisors of San Luis Obispo County Give Praise.

APPRECIATION of the services of Governor C. C. Young, B. B. Meek, Director of Public Works for California, and the State Highway Commission has been officially expressed by the board of supervisors of San Luis Obispo County.

A resolution, presented to the board by Chris N. Jespersen, assemblyman from this district, was unanimously approved by the board.

The resolution follows:

Whereas, the welfare of San Luis Obispo County requires the development of and careful consideration for the National Guard Training Camp, the California Polytechnic School, and our highway system and

Whereas, Governor C. C. Young, Director of Public Works, Bert Meek and the State Highway Commission, together with its staff and engineers including Divisional Engineer Lester Gibson, located at San Luis Obispo, have shown at all times a proper appreciation of and keen interest in the problems of our county and the best interests of our training camp, Polytechnic School, and that part of the state highway system within San Luis Obispo County, and

Whereas, this appreciation and interest has been typical of the appreciation and interest of these men in the affairs of this state and every community therein; and has earned for them the commendation of the people of this state; now therefore

Be It Resolved, that we the Board of Supervisors of San Luis Obispo County do hereby commend Governor C. C. Young, Director of Public Works, B. B. Meek, the State Highway Commission, its staff and engineers, for their high standard of public service as exemplified by the manner in which they have performed their various duties and especially for the consideration they have given the affairs of our county.

Be It Resolved, that a copy of this resolution be spread on the minutes of this board, a copy be sent to Hon. C. C. Young, Governor of California, a copy to the Hon. Ralph Bull, Chairman of the Highway Commission, a copy to B. B. Meek, Director of Public Works.

* * * * *

"Road Builders Unsung Heroes of Perilous Job."

THE SAN FRANCISCO *Examiner* editorializes under the heading quoted above as follows:

Road building calls for the willingness to risk one's life and limb, something motorists fail to realize when they travel serenely over the smooth ribbons of highway now found everywhere.

Consider, for example, the case of Grant Merrill, a maintenance superintendent for the State Highway Department. He was making tests recently of the snow in the High Sierra preparatory to instructing his crews in its removal.

A powder cartridge he was using to test the depth and condition of the snow exploded prematurely and blew off his arm.

He might just as well have had one of his laborers use this dangerous explosive and have saved himself, but the road service has built up a tradition for quiet courage just as great as those more picturesque arms of government which the movies enjoy depicting.

It has proved itself in time of flood and in invading danger spots to repair, sometimes at great hazard, the ravages of storms.

The mountain road which the unthinking complain of as narrow and inadequate was built by these men hanging high above a gorge on road equipment not as easily handled as a motor car.

And, though their courage goes unsung, their ranks contain many Grant Merrills, superintendents who do the dangerous work themselves.

* * * * *

Contractors Give Loyal Cooperation.

THE CONTRACTORS of California will do everything in their power through the distribution of state highway money to alleviate the damage caused in many parts of California through the heavy frost of last spring.

This is the substance of a large number of replies received by the Division of Highways in response to its request that contractors awarded state highway work employ, as far as it is possible for them so to do, local labor on their contract and purchase supplies from local merchants. A letter containing this request has been included with every contract signed

by Director Meek within the past four months. In this letter Mr. Meek calls attention to the desirability of compensating to some extent for frost losses through distribution to local labor and local merchants of expenditures upon state highway projects in their vicinity.

The response of the contractors has been gratifying. A number of letters have informed Mr. Meek that the policy outlined in his letter had already been put into force. Other letters applaud the soundness and desirability of the plan.

* * * * *

Unique Highway Planting Plan Is Proposed.

PLANS FOR sensational adornment of desert stretches of the highway, east of Banning, have been presented to the Redlands Chamber of Commerce. A suggestion came from E. A. Bayley, assistant engineer of the Los Angeles bureau of water and power, that borders of ocotillos be planted along the highway.

Mr. Bayley gave the chamber of commerce a mental picture of a million long, upright lances, all flaunting scarlet pennants at their tips. Their color would suggest California to the motorists. Mr. Bayley would arrange the ocotillos in double rank over nearly 100 miles of the shimmering desert between Mecca and Blythe.

This, he declares would make the road the most colorful drive in the world. It would be unique, he says, among 6,500,000 miles of highways criss-crossing the globe, and an extraordinary tourist attraction.

* * * * *

Grange Is Pleased With New Bridge.

The following resolution has been received from Silverado Grange at Calistoga, Napa County:

Whereas, The California State Highway Commission has just completed the construction of a concrete bridge on the State Highway, about two miles north of Calistoga, on the main highway between Calistoga and Middletown, and thereby eliminating a dangerous curve and bridge, that previously existed at this location; and

Whereas, The board of supervisors of Napa County gave their support to this undertaking by securing the necessary right of way for the new alignment; therefore be it

Resolved, That Silverado Grange in regular meeting assembled the twentieth day of July, 1929, do hereby thank and commend the California State Highway Commission for this new improvement, and the board of supervisors of Napa County, for their cooperation.

Highway Builders Assist State In Quarantine Work

The following letter of appreciation has been received from G. H. Hecke, Director of Agriculture:

Sacramento, Cal., July 15, 1929.

Mr. B. B. Meek, Director,
State Department of Public Works,
Sacramento, California.

Dear Mr. Meek: It was my intention to have written you sooner in appreciation of the excellent cooperation we have received from your men in different sections of the state relative to the construction of our border quarantine stations. Mr. Norman Underwood, who is a superintendent in Division No. 1 at Crescent City, very courteously and energetically assisted in the establishment of our station there within the very shortest possible time; also the work that was done under the instruction of District Engineer, Mr. Comly, in connection with our Hornbrook station, was handled most effectively.

In a letter of June 7 from Mr. Dennis, he advises that an estimate is to be secured in connection with grading and crushed rock work at our Truckee station. This will add materially to the value of the station there, and the Department of Agriculture will gladly pay whatever the necessary charges are.

I assure you that I appreciate the assistance the various men in your department have given us.

Very sincerely yours,

G. H. HECKE,
Director of Agriculture.

MR. AVERAGE MOTORIST, WHAT DOES STATE HIGHWAY SYSTEM COST YOU?

(Continued from page 1.)

Accordingly the need for income in California today must be judged by the highway standards of the present, and not those of years ago.

Judged by these standards, the opinion, entertained by many, that California today has a surplus of state highway revenue is emphatically not true. Present income is adequate if spent in an orderly and economical manner, but it is not excessive.

It is no more possible for California to operate in 1929 under the revenues of 1912 than it would be to build the pavements under the standards of construction that prevailed then.

A little fellow of our acquaintance wants to know why vitamins were put in spinach and cod-liver oil instead of in cake and candy.—*Boston Transcript*.

Special Highway Study Launched

THE MOTORING public is now having the opportunity of becoming acquainted with the special traffic checking crew of the Division of Highways. A three-man party started out July 10th to collect traffic information on the various roads which are to be considered in connection with recommendations to be made by the Highway Commission to the state legislature as required by concurrent resolution of that body.

In order to ascertain if the traffic is "local," "intercounty" or "through" it is necessary to stop each vehicle which passes any given station. "Through" traffic is defined as traffic which originates or terminates on a state highway, regardless of the distance traveled. "Intercounty" use is necessary to determine the extent of joint use of a road common to two or more counties. "Local" traffic is that which originates on the particular road or from roads immediately tributary to it.

Five informational counts in all are to be made. These counts will be for eight-hour periods and at various hours of the day. At least one count will be a night count.

Several density counts will be made at these and other stations during the year, but these counts will not interfere with or delay traffic. The volume and type of traffic is to be recorded during the density counts.

The resolution of the legislature directed the study, of which the traffic count is a part, to determine:

(1) Roads not now in the state highway system, which, in the opinion of the California Highway Commission and the Department of Public Works, should properly be included in it;

(2) The extent to which there is a lack of balance which prevents a well-ordered and unified system, and the manner in which such lack of balance may be corrected;

(3) A study of the state highway system, which will give information regarding the cost of bringing the system up to a stage where traffic on our highways is adequately and economically served;

(4) The extent to which highways may be added in the next two years to the state system without unduly jeopardizing existing and future maintenance and construction funds; and

(5) Some method by which these maintenance and construction funds may as soon as possible be made available for the new roads that may be added to the state system.

Other provisions contained in the legislative resolution are:

Additions shall during the next two years be made to the present secondary highway system, totaling between 10 and 12 per cent of existing state highway mileage, said mileage to be added in the ratio of not less than three or four miles in the south to one mile in the north.

Under this provision it is intended to progressively correct the present disparity in secondary highway mileage between the northern and southern counties. In his message to the legislature, Governor Young commented as follows on this phase of the highway problem:

"The present highway system as built up during previous administrations included only 525 miles of secondary roads in the southern counties as against 1778 miles in the north. This means that whereas the north has 1778 miles over which to spread its allotment of secondary highway funds, the south has only 525 miles on which to use an equal allotment, thus requiring that, until this lack of balance is adjusted by taking in other roads which may qualify for a place in the state system, there must be an uneven development of the secondary system in the two ends of the state.

"No one, I am sure, would wish to disturb the equal allotment of funds to northern and to southern secondary roads. It is obvious, therefore, that an unsatisfactory condition will exist until the present great disparity in secondary mileage is reduced. The Highway Commission assures me that on the basis of preliminary investigations it is also obvious that, in the 10 to 12 per cent increase referred to above, they must of necessity recommend the addition of three or four times as much mileage in the south as in the north. This addition will be confined to the secondary system and by so doing it will more nearly equalize the secondary mileage in the state."

Other provisions of the resolution provide that there shall be no change in the present statutory division of secondary highway funds.

A Tribute to the Highway Engineer

[From the BUILDING AND ENGINEERING NEWS, San Francisco]

Back on the job after two weeks out in the great open spaces.

Up the Redwood Highway—along a bit of the Columbia River Highway in Oregon—thence a return trip to the land of "Sunshine, Fruit and Flowers" via the Pacific Highway into the world famous Yosemite National Park.

God bless the highway engineer and the fellows who follow in his path in the construction of roads and bridges that permit you and I to travel from the four corners of this great United States to any metropolitan city, town or hamlet we desire to reach.

Words fail me in my desire to pay tribute to the highway engineer. A noble profession.

Motor up the Redwood Highway through Marin, Sonoma, Mendocino, Humboldt and Del Norte counties into Grants Pass, Ore. A ribbon of roadway surpassing any you have yet driven over. See agricultural activities at their best—cattle—timber, Redwoods and more Redwoods—the Eel River—and—at the end of your journey in Del Norte County view the Pacific Ocean with its jagged edge at Trinidad—"the fisherman's paradise." A wonderful trip. Thanks to the highway engineer.

Make the return trip on the Pacific Highway. Circling the Siskiyou Mountains, a second-to-none highway. Zigzag, bow-knot and curl over this roadway. See the timbered mountains. There just ahead, then on the right, then left and again in the rear you have towering Mount Shasta with its snowy peak looming above like a huge cake covered with frosting. A wonderful drive is the Pacific Highway. Thanks to the highway engineer.

Continuing on we cut across valley and mountain, river and creek, headed for the Yosemite Valley.

Leaving Merced we motor over the All-Year Highway into the valley.

This roadway is a monument to convict labor working under the supervision of the State Highway Commission. For this highway, running along the Merced River for miles, we owe another debt to the highway engineer.

Enter the Yosemite Valley. Truly God's masterpiece in California. On the left the restless Merced River fast flowing to keep ahead of its seemingly never ending end

thundering down the many falls throughout the valley.

Look here on the left and see El Capitan, that huge stone mountain which commands your attention upon entry and departure from the valley. Pass the lodge and view Yosemite Falls. Continuing on look above and see North Dome and just ahead the closing section of the valley. On the right higher up you see Half Dome, another mountain of rock, then just a bit to the right again you have Glacier Point and farther on Bridal Veil Falls, the Cathedral Spires and the Three Brothers.

Again thanks to the highway engineer. Good roads lead into Yosemite Valley. Roads that traverse through and around beautiful country.

"See America First" is a good slogan.

However, "See California First via State Highways" is a better one.

In paying tribute to the highway engineer the writer does not seek to belittle the highway contractor for his part in making California's wonderful highway system. The writer pays tribute to the man who "created" the system, not to the man who follows with blueprints, machinery, rock, steel, cement and other materials.

The highway engineer goes first. A big city, a barren valley, a mountain or a body of water is before him. He must lay out the line. He must lay out the best route to permit traffic to proceed with speed and safety. He must lay out the most economical route, for highways cost money. From his survey figures the road is created on blueprints. Nothing remains but for the contractor to read the prints, assemble materials and equipment and complete the project.

In the past I considered the architect as the great "Creator" on earth. Today we view a vacant lot in the downtown section. Six months from now on that same lot we view a towering skyscraper. From blueprints of the architect the structure was "created" with a quantity of rock, sand, steel, lumber, cement, etc.

The architect has his site located, knows the exact amount of money his client desires to put into his structure and proceeds with his ideas to "create." His "creation" takes effect in a modern office.

God bless the highway engineer. And now, vacation is over. Back to work.

Road Improvements Secured Through New Contracts Awarded During Month

The following summary shows the awards of contracts from June 25 to July 25, the sections to be improved under these contracts, and the character of their improvement. In accordance with the policy of the Division of Highways, the award of contracts is timed to take advantage of favorable climatic conditions for road building. Thus winter work is largely concentrated in southern California and summer work in the northern part of the state.

Will Stop Road Flooding.

W. J. Nethery and Son, Riverside.—Two reinforced concrete bridges, one across San Antonio Creek at Pomona and one across Collins Creek about 4 miles east of Ontario, both on the state highway extending from west of Claremont to Riverside. These bridges are being constructed on the existing highway to eliminate a bad condition due to the flooding of the road at these points at times of excessive rainpour. The plans call for three 27-foot reinforced concrete girder spans and three 14-foot reinforced concrete slab spans with approaches graded and paved to both bridges; contract price \$83,170.65.

Eliminates Dangerous Bridge.

Bodenhammer Construction Company, San Diego.—A concrete reinforced girder bridge across Cottonwood Creek in Tehama and Shasta counties, consisting of twenty 60-foot spans on concrete piers. This new bridge is being built on improved alignment which eliminates the present crooked county road and an old dilapidated bridge. It provides a longfelt need on this highway, as it was considered the worst portion of the Pacific Highway between Sacramento and Redding. Contract price, \$159,827.

Widens Road, Better Crossing.

Valley Paving and Construction Company, Visalia.—Grading and paving with Portland cement concrete a section of the Valley Highway, 4.1 miles long, between Berenda crossing and Califa in Madera County. This improvement will replace the present road which consists of a 15-foot concrete pavement lying east of the railroad between Califa and Berenda. The new road is on the west side of the railroad and will cross the railroad near Califa at a grade separation structure to be built under another contract. The new road will eliminate the crossing at Berenda by making the crossing at Califa, which is also the junction with State Highway Rt. 32 (Pacheco Pass), thus providing one crossing to serve traffic on both routes. Contract price, \$164,511.10.

Replaces Narrow Bridge.

Ben C. Gerwick, Inc., San Francisco.—Bridge across Salinas River at San Ardo, consisting of ten 100-foot steel truss spans and seventeen 27-foot reinforced concrete girder spans. This structure will replace the present bridge which is only 15 feet wide and as built by Monterey County in 1907. It is in poor condition, and by reason of its location on the Coast Highway is subject to a large amount of traffic at all times of the year. Contract price, \$233,107.

Surfaces Highway.

Montfort and Armstrong, Sacramento.—Three-mile section to be graded and surfaced with untreated crushed gravel or stone between McGee Creek and

Convict Creek in Mono County, on the Bishop-Bridgeport road. The roadbed is to be graded to a width of 24 feet with surfacing 20 feet wide.

One-Way Road Replaced.

Camino Construction Company, Palo Alto.—Reinforced concrete bridge 40 feet long over Markleeville Creek in Alpine County and constructing a graded roadbed 24 feet wide with surfacing 20 feet wide and 8 inches thick of untreated crushed gravel or stone. This project constitutes a new road alignment and a relocation of the bridge across Markleeville Creek, replacing the present one-way crooked road and an old bridge. Contract price \$17,536.

Eliminates Narrow Trestle.

Larsen Brothers, Sonoma.—Constructing a graded roadbed 36 feet wide and placing gravel or stone surfacing 20 feet wide from Arno to McConnell Station in Sacramento County on the Valley Highway. This project is a link in the main traveled highway between Los Angeles and Sacramento via Stockton and is known locally as the Upper Stockton Road. There is a heavy traffic over it. Bridges across the Cosumnes River and overflow are being built under another contract. This improvement will eliminate the present narrow trestles across the Cosumnes River overflow. The crushed gravel or stone surfacing will serve traffic for a year while the fills are settling and will provide a base for the pavement to be placed next year. Contract price, \$57,098.50.

Widen Bridge, Better Alignment.

W. L. Proctor, Santa Rosa.—Bridge across Novato Creek, one mile south of Novato in Marin County on the Redwood Highway. The new bridge will replace a present narrow bridge and will be built on an improved alignment. The structure will consist of four 34-foot reinforced concrete girder spans on pile bents. Contract price, \$27,961.

Corrects High Crown on Narrow Fill.

C. W. Wood, Stockton.—Three and one-tenth mile section to be graded and paved with Portland cement concrete between Banta and the San Joaquin River in San Joaquin County. This section is a part of the highway locally known as the "West Side Road" or "Tracy Highway." It carries a heavy traffic from Oakland and San Jose to Stockton. The improvement will eliminate the present high crown pavement on the narrow fill. The roadbed is to be graded 36 feet wide with a Portland cement concrete pavement 20 feet wide. Contract price, \$141,525.24.

Steep Grades Overcome.

T. E. Connolly, San Francisco.—Nine and three-tenths miles to be graded between Airport and Indian Springs in Placer and Nevada counties on the Victory

Highway. This new section will eliminate the steep and dangerous hill at Crystal Lake. Two railroad separation structures are to be built under separate contracts, which will eliminate the present dangerous crossing through the snowsheds at Immigrant Gap and Crystal Springs; roadbed to be graded 28 feet wide. Contract price, \$396,385.

Widens Highway.

Hanrahan Construction Company, San Francisco.—Grading and paving 8.7 miles between Hayward and Niles in Alameda County. The project calls for constructing a graded roadbed 47 feet wide and placing Portland cement concrete and asphaltic concrete pavement to a width of 20 feet. This section is a part of one of the two main arteries extending south from the East Bay cities. It carries a very heavy traffic. The present 18-foot pavement is too narrow to serve this traffic. The underpass at Niles is to be improved by building a new underpass for pedestrians and using the space of present sidewalk for an increased road width. Contract price, \$325,305.85.

Replaces Inadequate Bridges.

M. B. McGowan, San Francisco.—Construction of a reinforced concrete bridge, consisting of two 47-foot 6-inch spans and three 60-foot spans with 24-foot roadway, across Shasta River in Siskiyou County on the Pacific Highway. This project is about 5 miles north of Yreka. This is one of three bridges to be built in Shasta Canyon on new alignment on this route, replacing present inadequate bridges. Contract price, \$20,411.25.

San Anselmo Pavement.

A. G. Ralsch, San Francisco.—Paving 0.6 mile with asphaltic concrete through San Anselmo in Marin County. Contract price, \$10,417.

Timber Bridges.

M. J. Bevanda, Stockton.—Construction of timber bridges and approaches at Yerba Buena Creek in San Luis Obispo County. Contract price, \$9,608.30.

Cement Bridge.

William Lane, Paso Robles.—Construction of a reinforced concrete bridge over Graves Creek in San Luis Obispo County. Contract price, \$10,977.50.

Better Cosumnes Bridge.

Griffith-Hunter Company, Sacramento.—Bridge across Cosumnes River and overflow channels in Sacramento County on "Upper Stockton Road." The contract calls for the construction of a bridge consisting of four 54-foot reinforced concrete girder spans on concrete piers and 437 feet of timber trestle approaches on pile bents across the main channel, and two bridges across overflow channels, one consisting of 285 feet of timber trestle and the other 836 feet of such trestle. This project is a part of the main valley route from Sacramento to Los Angeles and carries a heavy traffic. The present structure which will be replaced consists of a steel bridge across the main channels and wooden trestles across the overflow, all in poor condition. Contract price, \$123,850.50.

Safer Crossing.

Peninsula Paving Company, San Francisco.—Grading and paving 10.3 miles between Chualar and Salinas in Monterey County on the Coast Highway. The roadbed is to be graded to a width of 36-feet and an asphaltic concrete pavement laid 20 feet in width. The alignment of this section has been revised to eliminate

the right-angle turns at the railroad crossing at Spence, at which point an underpass will be built under another contract. Contract price, \$236,484.85.

Improved Alignment.

George J. Ulrich Construction Company, Modesto.—Bridge across Arcade Creek in Sacramento County on the Auburn Boulevard. This bridge is being built on improved alignment and will replace the present narrow bridge and its dangerous approaches. Contract price, \$13,131.50.

Stockpiling Material.

Hein Brothers and Chittenden, Napa.—Placing and stockpiling crushed rock surfacing on the existing roadbed at different locations from Susanville to a point 2 miles west of Milford in Lassen County on the Lassen Boulevard. This project will enable economical operation of this section of highway upon which traffic has increased heavily since the improvement east of Susanville. Contract price, \$38,536.90.

Last Gap Improved.

Deveri and Company, and J. A. Maddox, Klamath Falls.—Constructing a graded roadbed 56 feet and 24 feet wide and placing crushed rock surfacing 20 feet wide from Goodrich to Coppervale in Lassen County, on the Red Bluff-Susanville Highway, a distance of 4.38 miles. This is the only remaining gap on this road, other portions being either improved or under construction. Contract price, \$68,212.20.

Bettors Surface.

Jack Casson, Hayward.—Placing on existing surface a bituminous surface treatment consisting of screenings and asphaltic road oil, extending 14.5 miles from the Klamath River to the Oregon line in Siskiyou County on the Pacific Highway. Contract price, \$17,876.50.

Pacific Highway Bridge.

Carlson Brothers, Turlock.—Reinforced concrete girder bridge across Mears Creek, 5 miles south of Castella, Shasta County; bridge structure consists of one 60-foot span and two 44-foot spans on concrete piers and abutments; contract price \$19,978.80.

Paves to County Line.

A. Teichert & Son, Inc., Sacramento.—Constructing a graded roadbed 24 feet wide and placing a bituminous macadam pavement 18 feet wide for 5.9 miles between the Estrella River and the Sacramento Ranch in San Luis Obispo County on the Cholame lateral. This project is a portion of the Cholame lateral which connects the Coast Highway with the San Joaquin Valley. When completed it will be the last unit of a paved highway from Paso Robles to the Kern County line, and will provide adequate facilities for the rapidly increasing traffic over this route. Several dangerous curves will be eliminated. Contract price, \$76,776.90.

Easier Curves, Better Alignment.

Basich Construction Company, Los Angeles.—Constructing a graded roadbed 36 feet wide and placing a Portland cement concrete pavement 20 feet wide between Kitchen Creek and La Posta, 3.9 miles in San Diego County. This project is a portion of the San Diego to El Centro road. Several short radius curves will be eliminated and the alignment and grade improved generally. Contract price \$186,446.

(Continued on page 25.)

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GEORGE C. MANSFIELD..... Editor

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Eleventh and P Streets, Sacramento, California

THE OPEN ROAD

By JAY F. BEAMAN, Resident Engineer,
Paxton, California

The open road! When man first caught
A widening vision; when he thought
Dim distance might new beauties hold,
And strange new knowledge might unfold,
He then the far adventure sought.
He journeyed forth, by ways untaught;
The path was rough, and danger fraught,
For those who sought, in days of old,
The open road.

But pressing onward, fearing nought;
With growing knowledge, dearly bought;
With groping footsteps, toil untold,
For future men to have and hold;
Through earth and sea and sky we've wrought
The open road.

THE CONCRETE MIXER

I'm the Concrete Mixer;
Old, and ugly, and noisy;
That's me.

I'm all rusty, and
I'm all covered with mud,
But, believe me,
I can work.
I take your gravel,
Your sand, and cement,
Into my stomach,
And mix it around,
Then pour it forth,
Your precious Concrete,
For you to fashion into
Buildings, and roads,
And statues.

I'm crude, I know;
But, I love buildings,
And roads, and statues.
Hugh Brown, Palo Alto.

JOY SEEKERS

By CHARLES HORACE MEIERS, Santa Cruz

Away on the smooth straight highways
The automobiles speed along,
With riders from countless byways,
To join the great joy-seeking throng.

The honk of the claxon is vicious,
Or kindly, impatient or gay;
Sensations are chiefly delicious
As pleasure-crowds go on their way.

That fortune is ample, or meager,
The kind of a car tends to show;
But all are delighted and eager
To leave care behind as they go.

Away on the smooth straight highways
The automobiles speed along;
And riders come in from the byways
With hearts full of laughter and song.

State Highway Progress Reports

FRESNO COUNTY

Day labor forces have completed oil mixing 14 miles of the Sierra-to-the-Sea Lateral from 7 miles west of Coalinga to the Monterey County line.

Tiesau Bros. of Berkeley were successful bidders on the surfacing of oil mix material for 7 miles, from Coalinga west on Route 10. The work is expected to start at once.

Camp has been established at Kings River Canyon for the reception of convicts and the first crew of convicts arrived July 1, to start work on this route into the high Sierra.

KERN COUNTY

Force, Currigan & McLeod, Contractors on Route 57, from Bakersfield to the mouth of Kern River Canyon, are making rapid progress on their contract for grading and surfacing.

C. W. Hartman of Bakersfield is nearing completion of work on his contract for grading and rock surfacing between Pentland Junction and Route 4 on Route 57.

MADERA COUNTY

Haurahan Company completed their contract for building approaches and paving to the Herndon Bridge over the San Joaquin River.

The Valley Paving Company were low bidders on 4.1 miles of grading and concrete paving between Berenda and Califa.

MARIPOSA COUNTY

Basich Bros. are completing their job of grading and placing crushed rock on their section of the Yosemite All Year Highway.

Oil mixing work is under way from Briceburg to Mariposa and it is expected this work will be completed by August 1.

MERCED COUNTY

Widening of grade and extending culverts by day labor is completed on the Merced section of the Yosemite Highway. This work is being done by day labor forces.

Oil mixing of shoulders and slopes north of Merced is under way and will soon be completed.

MONTEREY COUNTY

Bids are being received for the reconstruction of the Coast Highway from Salinas to Chualar, a distance of 10 miles. Reconstruction includes grading a 36-foot roadbed and placing a 26-foot asphalt concrete pavement. It is also proposed to eliminate the grade crossing of the Southern Pacific tracks near Spence by making a change of line about 0.6 of a mile in length, and constructing an underpass. Plans for the subway are being prepared by the Bridge Department.

A change of line 1.5 miles in length at the approaches to the new bridge to be built across the Salinas River at San Ardo have been prepared. Bids on the bridge were received June 26, 1929.

Plans are being prepared for a change of line about one and one-half miles in length for a new crossing at the Salinas River at Bradley. A new bridge is contemplated at this point also.

Construction work with convict labor is in progress on the Coast Highway (San Simeon-Carmel) in the vicinity of the Little Sur River, and of Villa Creek. A crew of 85 men and 2 power shovels are working at Little Sur, and 110 men and 3 shovels are working at Villa Creek. Surveys for the completion of this scenic route are in progress on the coast opposite Jolon. Approximately 5.9 miles of grading are complete, and 1.1 miles have been rough graded at these two locations. When the convict camps are moved farther in from each end, the public will be permitted to drive over this newly graded road, and will be treated to some of the most picturesque coastal scenery in the state.

SAN BENITO COUNTY

Plans have been completed for a minor line change on the Coast Highway near the San Benito River. This is a betterment of the alignment of a reverse curve.

SAN LUIS OBISPO COUNTY

On the Cholame Lateral, from 1.7 miles west of Shandon to the Kern County line, 15.4 miles of grading and paving with bituminous macadam on a water-bound base 18 feet wide are nearly complete. A. Teichert & Son are the contractors.

The reconstruction of the Coast Highway between Pismo and Arroyo Grande, 2.3 miles in length, has just been completed by the Cornwall Construction Co., Contractors. This is Portland cement concrete pavement 20 feet wide through Pismo and 20 feet wide for the remainder of the job. The Hunt process was used for curing the pavement. An improvement district has contracted for widening the pavement through Pismo to a width of 65 feet, and the Cornwall Construction Co. are doing this work also.

Just north of the city limits of San Luis Obispo a change of line one mile in length has been completed by Ariss-Knapp Co., Contractors. This road has been surfaced with a waterbound macadam and an oiled macadam surface course. This change eliminates some very dangerous alignment and steep grades.

Bids have been received on surfacing and oiling a portion of the Cholame Lateral from the Estrella River to the Sacramento Ranch, a distance of 5.9 miles. This will be similar construction to that on the adjoining section, which has just been completed as noted above. The completion of this stretch will give, with the concrete pavement out of Paso Robles for 11.5 miles, a hard-surfaced road for the entire length of this road in San Luis Obispo County.

M. J. Bevanda was recently awarded the job which consists of grading and paving with a 26-foot Portland cement concrete pavement from Cuesta to one and one-half miles south of Santa Margarita, a distance of 1.9 miles. This work straightens the present alignment and increases the sight distance on vertical and horizontal curves.

Bids were received in District V office for grading and surfacing with screened gravel on a portion of the Carmel Highway, 0.9 of a mile north of Cambria, about one mile in length, through Cambria Pines. Tiffany, McReynolds & Tiffany were low bidders.

Plans have been completed for the reconstruction of the Coast Highway from Atascadero to Paso Robles, a distance of about 10 miles.

A new shop building for the District Equipment Department has been completed. This is located on district property in San Luis Obispo, acquired about a year ago. The Equipment Department has moved into their new quarters and are very much pleased with the new offices and shops.

SANTA BARBARA COUNTY

The Coast Highway between Naples and Goleta (3.5 miles) is being graded and paved (second story) with asphaltic concrete 20 feet in width. Sam Hunter is Contractor. It is expected that this work will be completed in July.

Between Benham in Ventura County and Carpinteria in Santa Barbara County, a change of line 1.2 miles in length is under construction. McCray Company are Contractors. It is expected that this work will be completed in October. This change includes an overhead crossing which eliminates a narrow subway with dangerous approaches, and a considerable shortening of the length of road.

The overhead structure crosses the main coast line of the Southern Pacific Railroad at a very flat angle, making the length 570 feet. Paul M. White is Contractor. The bridge is under the supervision of the Bridge Department.

The Cornwall Construction Company, Contractors, have completed 0.3 of a mile of 30-foot concrete pavement in Montecito.

Plans are being prepared for changes of line and reconstruction through Gaviota Canyon.

TULARE COUNTY

Masonry wall at a dangerous point on Route 10, east of Lemon Cove, has been completed by day labor forces.

HIGHWAY WORK AND EMPLOYMENT

Information is now being collected by the Division of Highways showing the effect of highway work on the unemployment situation, both as regards employment of labor directly on the state highway by contractors and the state and indirectly in the manufacture of materials, equipment and the like.

ROAD IMPROVEMENTS SECURED THROUGH NEW CONTRACTS AWARDED DURING MONTH

(Continued from page 22.)

Bridge on Highway Under Construction.

Lord and Bishop, Oroville.—Timber bridge across Little Sur River about 14 miles south of Carmel on the Carmel-San Simeon Highway, now being built by convict labor. The structure will consist of one 50-foot deck truss span on concrete piers and fourteen 19-foot spans on frame bents, concrete footings. Contract price \$27,454.

Approaches to Railroad Crossing.

Tieslau Brothers, Berkeley.—Constructing a graded roadbed 24 feet and 28 feet wide and placing a crusher run base 20 feet wide at Magra in Placer County. This project, which is 1.4 miles in length, provides the approaches to the overhead crossing at Magra, now under construction. Contract price, \$22,836.

GOOD ROADS

Good roads are friendly things; they link the town
With county seat, promote the godly plan
Of commerce blended with the heart of man.
Who fares the roadways forth may wear a crown
Or link his name ancestral with renown,
But here he joins with all the common clan
In universal brotherhood of man
And wears the bronze of woodland's golden brown.
Good roads are helpful things; they prove their good
By making distances a thing of song.
The market's call, the school's resounding gong
Are music for the timely, anxious throng;
While joining states, through ways of vale and wood,
They make a Nation just a neighborhood.

—Platt Young, in *Georgia Highways*.

NORTH CAROLINA—Over 40 miles of machine-finished asphalt top pavement was completed in 1928. The finishing machine used on one large project saved \$20 a day over hand finishing.

FIRE ENGINES FOR FIELD AND FOREST

(Continued from page 5.)

At about seven in the morning the field kitchen equipment of the truck was brought into play and ham and eggs were used to revive the spirit of the truck crew.

In looking over the burnt area after the fire, the hills were black as far as the eye could see in some directions, and in riding through it, the remains of what was once a farm house or barn could occasionally be seen.

Practical assurance that this fleet of fast fire-fighting trucks will be increased to eight in the immediate future, has been given today by State Director of Finance A. R. Heron.

With four of the forest fire engines already in service, Mr. Heron announced that in view of the established effectiveness of the new equipment in suppressing dangerous fires it is planned to rush the building of four additional trucks authorized for next year.

The fire engines now in service are stationed at Riverside, Ukiah, Auburn and Bakersfield, operating in contiguous territory.

Additional trucks are badly needed, State Forester M. B. Pratt announced, particularly to work out of Redding and Santa Cruz.

Built especially for the state service on recommendation of Governor Young's forest fire committee and State Forester Pratt, the fire trucks were planned by Prof. J. B. Fairbanks of the State College of Agriculture and Russell Stalnaker, equipment engineer of the Division of Highways, and designed by Frank E. Burnside, shop superintendent.

Bureau Chief Writes Preface To New Book On Highway Problems

WASHINGTON, D. C.—A timely publication involving an extensive study on the subject, "Highway Construction, Administration, and Finance," is announced by the Highway Education Board.

It deals with the planning of a national highway system, with the various types of road suitable for differing traffic conditions, and with methods of financing such highway building. The studies are by E. W. James, chief of the division of design, United States Bureau of Public Roads, and now on leave in Columbia assisting that South American government in organizing a road-building program. The booklet is printed in Spanish, Portuguese, and English.

"Poor roads," says Thomas H. MacDonald, chief of the United States Bureau of Public Roads, in an introduction, "cost more than do adequately serviceable roads. Roads built with honest administration and skilled technique have an earning capacity far beyond their cost. So the serviceable public highway has every right to be listed as an asset and not as an expense. It has already been well demonstrated that the highway can earn its upkeep, plus a very high profit on the investment.

"Road tolls collected in the form of motor vehicle license fees and gas taxes in the United States amount to a very large percentage of the annual highway bill, without excessive cost to the individual user. The very fact of relatively low taxes has encouraged the enormous use of the roads by so large a number of the public. This accounts for the high income from the roads in actual financial returns. It proves the value of good highways."

Recognizing that the financial problem involved in the highway program is in all countries "the fundamental and difficult one to solve," Mr. James points out that, in order to keep expenditures to a minimum, three things must be attempted:

1. To select the right roads to be improved;
2. To determine the correct types to build at any time; and
3. To build progressively, but so that all work done may be salvaged in future work.

The best method, he asserts, is "deliberately to plan a national highway system." It matters not, he adds, that pioneer roads and trails have developed, that some roads already have been improved, that cities have grown and the rural districts have been put under cultivation. Such study, he says, may disclose errors of the past and may lead to a change in location and priority of construction for many miles of highways, but if it does it saves money.

"Studies of highway systems made in the United States during the past three years," says Mr. James, "clearly demonstrate the value of such work even at a late date. But obviously the earlier in the highway history of a country such studies are made the greater good will flow from them."

The general character and condition of economic development, as revealed in data based on population, agricultural production in tonnage for general crops and in cost for special crops, such as dairy products delivered directly for consumption, and manufactured products by cost, must be surveyed, it is stated, in approaching a national or state highway plan. Other factors which must be considered include topography;

Forest and State Officials Work to Save Road Scenery

The following self-explanatory letter has been received by Director B. B. Meek from S. B. Show, District Forester, with headquarters at San Francisco:

Mr. Barrett's letter to Mr. Purcell expresses accurately what the Forest Service has in mind in regard to protection of scenic values along state highways. You are correct in assuming that we do not intend to issue permits for buildings or structures within less than 100 feet of the center line of state highways on national forest land except in very unusual circumstances. I hope that you will understand that on private lands within the national forests we have no authority to regulate the placing of buildings and that on such lands the problem will have to be handled by the Commission.

You understand, too, I am sure, that we have a number of existing permits under which buildings have been constructed within less than 100 feet of the center line of state highways on national forest land. Where such circumstances exist it is our desire and intention to remedy the situation as rapidly as possible but even with our best efforts it is certainly going to take time to work out case by case these complications. It is our desire to work in closest possible harmony with the Commission in future developments along state highways and I am sure the forest supervisors will be glad to discuss with your division engineers permits which may arise in the future. I think you understand that our wishes are identical with your own, viz., to preserve to the maximum possible extent the scenic values along the state highways and not to clutter up the edges of the highways with unsightly structures.

Very sincerely yours,

S. B. SHOW,
District Forester.

existing traffic on the roads and the classification of this traffic; and the probable adequate mileage of roads in the system as a whole and in the several political or economic subdivisions thereof.

Emphasis is laid in the Highway Education Board's report on the importance of the progressive method of road building which, it is asserted, is "the only way possible to give service within any reasonable period to a state or nation which yet has most of its pioneer roads to improve."

As to financing it is declared that "roads should be built only to the extent and of such types as will pay for themselves." Every piece of construction, it is asserted, should be planned with an eye to the future and to the possibility, indeed to the probability, that a betterment of type will be required. Any highway expenditure to be justified must be earned by the road in the form of cheaper transportation, says the report, which argues that highways are fundamental requirements in a healthy, progressive, prosperous, and ambitious nation.

"She's a very nicely reared girl, don't you think?"
"Yeah. She don't look so bad from in front, either."—*Deschutes Pine Echoes.*

MAGNIFICENT HIGHWAY IS FORMALLY OPENED

(Continued from page 3.)

You have been patient and long suffering. We have built it as soon as it was humanly possible, since we came into office, as fast as good engineering and good construction practice would permit. We are already planning a highway twice as wide in view of the tremendous traffic that we know it is going to have to bear. We have already made our plans for this in the excavations.

COMMISSIONERS SPEAK

Commissioner Harris of Fresno declared: "This wonderful Southland amazes me every time I come into it and see the growth you have made."

California will soon have a population of 15,000,000 or 20,000,000 and we propose to build roads adequate for its traffic. We are making studies of future needs and are planning for the future—planning for the construction of the best that can be built, the best in the world. We are Californians building California roads and to us there is no north, no south, no east, no west, but one grand state, and highways are the best means of cementing the people of the different portions of our commonwealth.

Commissioner Baumgartner of Santa Ana asserted that "the completion of this wonderful highway shows that there is no insurmountable obstacle to the accomplishment of a worthy thing when California undertakes it."

I like to think of these great highways not in local terms, but in national terms, even in world-wide terms. This wonderful highway stretching up the coast from Mexico to Canada, over 2000 miles in length, belongs to the world and binds together the peoples of three nations.

Those bluffs to the south of you in the direction of Santa Monica will within a few years be surmounted by magnificent homes rivaling in beauty the famous castles on the Rhine. This road will belong to the ages and will stand as a monument to the peace of this Golden Age, as the Roman roads stand today as a monument to the soldiers of the Caesars.

Commissioner Moody of San Francisco, spoke briefly, expressing the hope that "the good people of this section will live for years to enjoy this magnificent highway which Governor Young dedicated today to your use and enjoyment and to that of the people of the world."

FACTS ABOUT THE ROAD

Here are some facts relative to the road:

State Highway No. 60, Oxnard to Santa Monica, was added to the state highway system by the 1919 Bond Act appropriating \$40,000,000 and adding additional highways to the system, this route being described as Oxnard to San Juan Capistrano.

The section from Oxnard to Santa Monica is 45.6 miles long, of which the first 10 miles, or until Point Magu is reached, lies through low cultivated areas

and across tide flats where material had to be hauled in to give a sufficient height to the embankment that carries the roadway.

From Point Magu to Santa Monica the remaining 3.6 miles lie among the face of the cliffs that dip into the ocean except at Dume point where the road turns inland for a distance of about 2½ miles and is at a maximum distance of approximately 1½ miles from the ocean.

The first contract covered the construction of 20 foot Portland cement concrete pavement between Santa Monica and Los Flores canyon, a distance of 7.4 miles. This contract was awarded to Lee Moor Contracting Company in November, 1922.

The close approach to each other of sea and cliff made surveys for the road's location exceedingly difficult and the road as located required the removal of a very large yardage to secure the necessary recess in the cliff's contour to permit the road's completion. A total of 2,440,500 cubic yards has been moved under the various contracts. Various methods have been used to protect the slopes of the roadbed from the destructive action of the waves.

Twenty-four groins consisting of timber frames filled with large boulders have been constructed at various points. These groins extend at right angles to the beach and are about 60 feet in length.

Over 40,000 cubic yards of heavy rip-rap have been placed at places where the wave action is more severe or where erosion of the retreating waves has threatened the stability of the slopes.

Three hundred reinforced concrete shells have been constructed, placed upon a prepared foundation and then filled with concrete to act as a first line protection for further protection work to follow.

Six hundred linear feet of rock filled cribbing has been constructed near Magu wharf as a guard against the encroaching seas.

All grading, paving and shore protection work on this route was done by the state at a cost of \$3,865,000, of which \$234,000 was spent or allotted for shore protection work completed or under way. Original funds were obtained from 1919 bond issue of \$40,000,000. Additional funds for completing this section were obtained from the additional one cent gas tax of 1927. Bridges were built by Ventura and Los Angeles counties.

CONCRETE TESTS NOW BEING MADE UPON IMPERIAL HIGHWAYS

A test is being carried on in the Imperial Valley near Brawley which is attracting widespread interest. It consists of experiments with several different curing processes of concrete pavements and several different admixtures in concrete. Eleven different surface treatments and processes designed with the idea of sealing the surface of the pavement against evaporation, together with one process designed with the idea of stopping the sub-soil from drawing water from uncured concrete, are being tried out.

The pavement is complete but the removal and breaking of test specimens will continue for several months. Definite conclusions will not be available until after the test specimens have been broken.

Report Made on Crossing Accidents

A concerted effort is being made by the California Railroad Commission, the Division of Highways and the railroads to eliminate grade crossing accidents. With this object in view the Transportation Division of the Commission's Engineering Department is keeping a careful check of all grade crossing accidents, and is making a detailed study of measures to prevent them.

Despite this effort Engineer Joseph G. Hunter, chief of the Transportation Division, today reported to the commission that during the first four months of 1929 there were 932 accidents at grade crossings, resulting in the death of 61 persons and the injury of 307. This is a marked increase in the number of accidents during the first four months of 1928, when there were 583, resulting in the death of 71 persons and injury to 229.

The Transportation Division calls attention in its report to the commission to the fact that the legislature at its last session, amended the Motor Vehicle Act to require all vehicles on the highways to stop before crossing over a railroad track when a warning signal is being displayed either by human flagman or automatic signal announcing the approach of a train. This amendment, which makes violation of its provisions a misdemeanor, punishable by fine or other penalties, becomes effective August 14, 1929. The Railroad Commission participated in the recommendation of the California Safety Council for the enactment of such a measure.

A study of the accident records for 1929 shows that there were 416 accidents at crossings without special protection during the first four months of this year. These accidents resulted in the death of 26 persons and the injury of 151. There were 369 accidents at crossings protected by some special signal, such as wig-wags, crossing gates and human flagmen, in which 24 persons were killed and 135 injured. The record also shows that 99 accidents occurred through vehicles running into crossing gates, resulting in the injury of four persons. During the same four months there were 11 accidents involving pedestrians with six persons killed and four injured. There were 16 accidents at private crossings, resulting in the death of three, and the injury of nine persons. In addition there were 21 accidents from miscellaneous causes, resulting in the death of two persons and the injury of four others.

JUST SURFACING

Small Boy: "What is college bred, pop?"

Pop (with son in college): "They make college bred, my son, from the flour of youth and the dough of old age."—*Two Bells*.

She came home with her hat on one side and her clothes all crushed looking.

"Looks as though she's been knocked down by a motorist," said one neighbor, sympathetically.

"Or picked up," said another, thoughtfully.

Taking the other fellow's dust is better than "to dust returneth."

Six feet have awaited many a driver who would not give an inch.

Just because you see its tracks is no sign that a train has just passed.—*Badger Highways*.

ELECTRICITY DEFINED

Electricity is something that starts the Lord knows where and ends in the same place. It is 1/36 of a second faster on its feet than its nearest competitor, backyard gossip, and when turned loose in Europe will get to the United States five hours before it starts. Nobody knows exactly what it is because it has never stood still long enough.

Electricity is sometimes known as science gone crazy with the heat, and if you can understand its maneuvers, you can do anything with it except open a can of peanut butter at a picnic.

Electricity was locked up in ignorance for centuries until Ben Franklin let it out with a pass key, and since then it has been pulling off more new stunts than a pet monkey.

With it you can start a conversation or stop one permanently, cook dinner, curl your hair, press your trousers, blow up a battleship, run an automobile or signal Mars, and many more things are being invented.—*Utility Bulletin*.

"In other days the women wore their dresses down to their insteps."

"Yes, but now they wear them up to their stepsins."

"The time will come," shouted the speaker, "when women will get men's wages."

"Yes," said a little man in the corner, "next Friday night."

Engineer predicts a fool-proof plane in another five years. However, the whole history of mechanics is that nothing is fool-proof as long as there's a fool.—*Arkansas Gazette*.

When the preacher called for women to stand up and promise to go home and mother their husbands only one little woman arose, and when he told her to go home at once and mother her husband, she said, "Mother him? I thought you said smother him."

"Why, Buddy," asked the teacher coming to a halt by his desk, "what are you drawing?"

"A picture of God," was the reply.

"But, Bobby, you must not do that. That's something that no one knows—how God looks."

"Well," Bobby confidently smiled, "they will when I get through with this."

The late William Rockefeller used to tell with delight a story illustrative of the financial genius of his famous brother, John.

"When John was a little fellow," he would begin, "a so-called Indian doctor visited our town with a cure-all. The doctor, to get started, took out a bright new silver dollar and said he would auction it off.

"How much am I bid?" he said, "for this bright silver dollar?"

"But the crowd was cautious, silent, suspicious. No bids were made.

"How much am I bid?" shouted the Indian doctor. "Come, come, gents! A nickel? A dime?"

"I bid a nickel," piped John D. Rockefeller at last.

"The dollar is yours, boy," said the doctor. "Hand up your nickel."

"Take it out of the dollar," piped little John D., "and gimme 95 cents change."—*Boston Globe*.

BUILDING SAFETY INTO STATE HIGHWAYS

(Continued from page 10.)

CONQUERING THE DUST MENACE

Dust on earth or rock surfaced roads is not only an annoyance but a decided hazard as well. An extensive program of dust laying is now under way on 1000 miles of our highway. Practically all of the rock surfaced roads have received an oil treated surface in the past two years and the hazard eliminated on some 1243 miles of such roads.

SMOOTHNESS AND SAFETY

In routine upkeep work particular attention is given to securing smooth-riding road surfaces. A considerable mileage of sandy or loose shoulders, particularly where adjacent to narrow pavement is being oiled this season. Nearly 700 miles are proposed for oil treatment during this coming biennium. Asphaltic concrete pavements, which have become rough and corrugated, are smoothed with a heavy planer. This planing also removes the excess asphalt and reduces the hazard from skidding when the pavements are wet. Nonskid surfaces have been placed on many asphaltic surfaced bridge floors. In frosty weather, the old smooth surfaces are extremely slippery. This work will be extended as necessary, and is also being tried out on slippery pavement sections. Sanding of pavements is carried on in foggy, frosty sections during the period of danger. Constant vigilance is expected of the maintenance organization on that score.

Warning signs are installed at locations where slippery conditions may be expected in wet weather. On some sections of mountain routes, where guard rail is not in place, curve warning posts, painted white, are placed to guide traffic in night driving. Marker posts are placed at the headwalls of pipe culverts to show traffic limits of the safe width.

WARNING SIGNALS

Reflector signals are installed at the more dangerous curves to warn traffic. The signals are single six-inch bullseye reflectors, or of the nine unit assembly of three-inch bullseyes. These signals attract attention at a distance of 600 feet. Large RXR signs, made up of the three-inch bullseyes, are being installed at a number of grade crossings. The Railroad Commission, at request, has arranged with railroad companies for several wigwag signals at various crossings. Overhead, illuminated railroad crossing signs are being installed at the more dangerous crossings.

Trees along the highway are given periodic inspection and overhanging limbs and decayed trees in dangerous situations are removed. Bridges are inspected so that dangerous conditions may be detected and corrected in time to prevent accidents.

GUARDING AGAINST ENCROACHMENTS

The placing of encroachments on the right of way and the planting of trees is guarded under permit so that dangerous situations will not occur. Temporary fruit stands are not permitted on the right of way and an effort is made to control the itinerent vendors who create a hazard through parking of customers' cars in traffic.

Particular attention is given to training the maintenance personnel to handle their work in such manner as to safeguard traffic. Accident reports are studied to ascertain if the accident was caused by the condition of the highway.

Several of the points brought out above are incidental to the carrying out of highway work but most of the items represent a direct expenditure which returns large dividends in insurance against personal and property damage.

THE MOTORIST FINALLY DECIDES

The Division of Highways desires to cooperate with other state agencies, with the automobile associations and with all organizations interested in safety measures, to the end that the public may use their highways in SAFETY. Particularly it bespeaks the assistance and the cooperation of the individual motorist. The reckless motorist can make the safest highway dangerous; and conversely, the careful motorist will ride in safety over a highway that, judged by technical standards, might be considered unsafe.

The best that the Division of Highways can do is to make the highway safe for the sane motorist. We are spending millions of dollars in doing this. But these expenditures and the months of effort spent in planning and building our highways can all be undone in the fraction of a second's time by the careless driver. I appeal to the individual motorist to do his part in this great work of making our highways safe by seeing to it that he drives in a safe and sane manner, with due consideration for the rights and the safety of other users of the highway.

KANSAS—Under a new law the state shall not construct more than 100 miles of high-type pavement in any one year until all the state highway system has been improved with an all-weather surface such as sand, gravel, stone or chat.

HIGHWAY BUILDING PROGRAM IS DRIVING AHEAD OF SCHEDULE

(Continued from page 12.)

construction projects, the funds for which came from the 1-cent gasoline tax, one of the major measures in Governor Young's program, and one of the first legislative enactments to receive his signature.

The distribution of funds for construction and reconstruction projects was determined by the percentage requirements set up in the Breed Bill.

Reconstruction, maintenance, right of way and other expenditures bring the total state highway disbursements for the biennium to an approximate total of \$41,074,736.55.

Construction and reconstruction projects during the biennium totaled 1030 miles. This establishes a new record in state highway history. During the two-year period a total of 103 new bridges were constructed at a total expense of \$3,000,000 and 17 bridges were widened. Twenty-four railroad grade crossing eliminations were either completed or contracts for their construction awarded. Contracts were awarded on 406 projects during the biennium.

Mr. Meek also reported that prior to June 30, 1929, contracts had been awarded for 17 projects in the program for the biennium of July 1, 1929-June 30, 1931.

Following the submission of the report, Mr. Meek made the following statement: "Too much credit can not be given to Ralph W. Bull, J. P. Baumgartner, M. B. Harris, Fred S. Moody and Joseph M. Schenk, members of the California Highway Commission, for the able manner in which they have fulfilled the duty imposed upon them by law, namely: that of determining the program upon which state highway construction proceeds and the allocation of funds to the different projects.

"That this program is proceeding on schedule is due to the energy and ability of State Highway Engineer C. H. Purell and his assistants, both at headquarters and in the district offices. The largest building program in the history of the state highway system was launched by them. They have spared neither effort nor hours in seeing that projects were ready for advertising and award in accordance with the schedule prepared for them.

"I feel that the volume of state highway expenditures is contributing to the prosperity

Too Many Children Are Crippled Each Year Playing With Blasting Caps

There are several hundred children crippled each year in the United States by playing with blasting caps which they have picked up in the vicinity of mines, quarries, or in the fields where agricultural blasting has been done.

This means that there are several hundred children who will have to go through life with mangled hands, faces, arms and legs. Some of them are killed.

Boys often play in and around quarries and sometimes pick up stray caps and start to investigate them. It is the rarest thing that they ever do this without getting hurt.

They perhaps know they are dangerous, and that a spark or a blow will explode them; but they do not realize how sensitive they are, how violent the explosion, or how the pieces of copper fly. Even the name is misleading in this respect. The word "Caps" suggest the paper caps used with toy pistols, and because the blasting caps are called by this name it is natural to think that the two articles belong to the same family. They may but they bear about the same resemblance to each other that a hungry, man-eating tiger does to the gentle pussycat.

A blasting cap is a copper shell about a quarter of an inch in diameter and an inch or two long, half full of fulminate of mercury. This fulminate is the most sensitive and about the most impulsive explosive in common use. Blasting caps contain anywhere from 15 to 30 grains of it; primers for firearms cartridges usually contain not more than $\frac{1}{2}$ grain. That's what the hammer or firing pin of a gun or pistol hits to ignite the powder in the shell. A blasting cap is meant to work the other way. The powder from the fuse ignites the fulminate in the blasting cap, and it explodes with terrific force and detonates the dynamite. The explosion of the fulminate is so exceedingly quick that the flying particles of copper will imbed themselves in iron a foot away. They will blow a hole clean through a steel plate one-sixteenth of an inch thick. A box of caps will blow a hole right through a two-inch oak plank. One cap will blow a child's hand off.

If all the children mangled during the past year by blasting caps had been hurt at one time, what an impression would have been created. But because the accidents are spread all over the country and happen at the rate of only about forty or fifty a month, nothing is done. Indeed the best thing to be done is to educate the whole population to realize how dangerous these exceedingly useful things are when they are out of their proper place, and what a dreadful thing it is to go through life crippled or blinded for want of a little care and knowledge.

of California through the large sums that are being distributed directly to labor and in the purchase of materials and supplies, and in the reduced cost of moving farm and other products to market. But even greater prosperity will come through the completion of the highways and the volume of business that improved highways bring to the state and its communities."

A WORTHWHILE DISTRICT ORGANIZATION

(Continued from page 15.)

This might be classed as trivial, but where 20 or 30 men are employed, the saving of half an hour a day for each person really amounts to considerable time at the end of a year, and at the same time has a tendency to make work better. We are all, to an extent, victims of the disease that makes us slight our work if the same particular part has been repeated many times in cut and try work.

These ideas have readily been given consideration by department heads, only for the reason that they have considered themselves one of us, and has had the tendency among the employees to have a higher regard for the dignity due a department head.

Much can be said for the educational benefits derived from the meetings. Perhaps the most important is the part in which a particular person has been active.

Our office force is to a great extent made up of young men who have not had the opportunity to talk before others, and, like most persons, were timid when it came to the point of standing before a gathering and talking, let alone presenting an idea to be considered. The first step toward this end was the scheduling of two members to give five minute talks or readings before each meeting. While some of the talks were short of the allotted time, others were inspired to such an extent that the talks continued for as much as fifteen minutes. To say that the effect has been accomplished can be proven by showing how the boys now debate a subject that has been presented for consideration.

Lectures by department heads and other persons feeling capable of talking for half an hour or more on a subject of interest have served a very good purpose and have been of great variety.

Mr. E. K. Guion presented "Highway Location and Location Economics" on two different occasions. In both of the talks, points of vital importance were brought to the attention of his listeners, whereby many of the mistakes of the past can be seen and at the same time placed something in our minds so that similar mistakes of location can be guarded against in the future.

Mr. F. W. Haselwood carried us through "The Development of the Highway Organization," showing what has been done in the past in order that highway work can and is expected to be more efficient today both to the department as constructors and to the public as users.

Mr. A. C. Irish read a thesis prepared by Mr. F. W. Haselwood on highway location, which embodied the fundamentals necessary for a near perfect highway.

Mr. F. W. Howard deviated from "Shop" and gave us many pointers on letter writing, all of which will be of value whether we become executives or not.

Mr. J. L. Piper brought to our attention "Construction Details and Problems." We of the office get very little opportunity to look upon the construction part of the work. No doubt this talk can be credited with the reason for several transferring to the construction department.

Mr. H. D. Jerrett chose as his subject "Rights of Way Problems." Details necessary to his department and its work were brought to our attention, many of which in the past seemed nonessentials to us, but have proven to be extremely important.

Mr. P. R. Green spoke on "Organization." His

talk brought out the benefits derived from organization in the past and its possibilities in the future, all of which can be expected from "The Forum."

Mr. J. W. Vickrey told us of his department, "Maintenance," one which receives little thought from the planning department, but which is extremely important to the life of a highway and the comfort of the traveling public.

At our last meeting Mr. Chas. H. Whitmore, our new District Engineer, gave "The Forum" his support and related to us his ideas in the past of providing a means of bringing employee and department head together. He also spoke highly of the idea and encouraged the continuation of the part next to follow.

A short study course was instituted several months ago, and Mr. N. T. Pratt was elected to the first course, having made two trips into the field to inspect location and construction and to make a report to "The Forum" of his findings.

One trip was over the projects known to us as the "Bowman-Weimar Line Changes" and the other the "Magra Line Change," the former being one of construction and the latter one of location. His report explained the methods and equipment employed and the possibilities to be expected regarding the completion of the contract. He further gave his views with regard to possible improvement of the line proposed at Magra, all of which have been given consideration and, if the change is adopted, his suggestions no doubt will carry considerable weight.

His second trip was over the contract now in progress at Clear Lake. The report on this trip dealt more with the reasons for the highway being located as it was. It might be said that land values were a big factor to be considered on this location.

It was the intention at the time we organized "The Forum" to have only a chairman and secretary to serve terms of three months, allowing a larger number of persons to develop their ability as executives. While there are no weighty problems involved, a great deal can be said for the chairman who provides a good program for the members and keeps up attendance. This establishes a mark for the succeeding chairman to attain and continually provides growth to the organization whereby it shall survive.

In conclusion I might say that organizations of this kind have beneficial characteristics that can be of great help wherever instituted and personally I feel that in time each state department, at least, will be handed together in such a way.

ALABAMA—State highways totaling 1350 miles in length were affected by the flood of the past spring. A much larger mileage of local roads was damaged. Repairing or reconstruction of state roads will cost at least one thousand dollars a mile, it is estimated. The principal damage was to sand fills. No important bridges were washed out.

KENTUCKY—Tree planting along state roads by various semi-public organizations is to be coordinated under plans and regulations now being developed. While no road funds are available for placing trees, the state highway department will maintain them under the direction of a tree expert furnished by the state horticultural society.

"There are just two things that break up most of the happy homes nowadays."

"What are they?"

"Women's love for dry goods and man's love for wet goods."—*Patton's Monthly*.

Record of Bids and Awards

BID OPENINGS FROM JUNE 4, TO JULY 17

ALAMEDA COUNTY—Between Hayward and Niles, about 8.7 miles to be graded and paved with Portland cement concrete and asphalt concrete. Dist. IV, Rt. 9, Sec. C. J. F. Knapp, Oakland, \$360,389.40; Healy-Tibbitts Const. Co., San Francisco, \$399,485.40; Jones and King, Hayward, \$361,503.24; Healey-Moore Co., Oakland, \$399,917.50. Contract awarded to Hanrahan Company, San Francisco, \$325,305.85.

ALPINE COUNTY—A 40-foot reinforced concrete bridge over Markleeville Creek and grading approaches 24-ft. wide and placing crushed gravel or stone surfacing 20 feet wide and 8 in. thick. Dist. X, Rt. 23, Sec. D. C. Miles, Sacramento, \$18,806. Contract awarded to Camino Construction Co., Inc., Palo Alto, \$17,536.

BUTTE COUNTY—4½ miles east of Oroville, a reinforced concrete arch bridge over the tracks of the Western Pacific Railroad and across the Feather River. Dist. II, Rt. 21, Sec. B. Healy-Tibbitts Const. Co., San Francisco, \$321,194; Guy F. Atkinson Co., San Francisco, \$218,582; Ward Engineering Co., San Francisco, \$298,545; Lord and Bishop, Oroville, \$177,560; Rocca and Caletti, San Rafael, \$213,322.50. Contract awarded to Paul M. White, Santa Monica, \$169,947.40.

EL DORADO COUNTY—Two timber bridges. One across Upper Truckee Creek, 5 miles north of Meyers and one across Trout Creek 6 miles north of Meyers. Dist. III, Rt. 11, Sec. K. Griffith-Hunter, Inc., Sacramento, \$14,185.50; M. B. McGowan, San Francisco, \$15,926; H. C. Whitty, Sanger, \$17,861; C. C. Gildersleeve, Felton, \$17,950. Contract awarded to Lord & Bishop, Oroville, \$14,990.

EL DORADO COUNTY—Constructing a reinforced concrete double box culvert across Meeks Creek. Dist. III, Rt. 38, Sec. C. Contract awarded to D. McDonald, Sacramento, \$9,050.

HUMBOLDT COUNTY—Near Beatrice, a bridge across Salmon Cr. consisting of two 31-ft. reinforced concrete girder spans on a concrete bent and concrete abutments with wing walls on pile foundations. Dist. I, Rt. 1, Sec. G. B. T. Millard and John Lohost, Lolo, \$11,157; Smith Bros. Co., Eureka, \$10,935.60. Contract awarded to Fred J. Maurer, Eureka, \$10,902.50.

LASSEN COUNTY—Bet. Goodrich and Coppervale, 4.4 miles to be graded and surfaced with untreated crushed gravel or stone. Dist. II, Rt. 29, Sec. A. A. J. Grier, Oakland, \$94,911; Tiffany-McReynolds, Tiffany, San Jose, \$75,837.80; Chas. Harlowe, Jr., Oakland, \$90,228; Tieslau Bros., Berkeley, \$106,780.50; J. F. Johnston, Stockton, \$99,690.10; C. Miles, Sacramento, \$83,375; Hemstreet & Bell, Marysville, \$91,365; Young Bros., Berkeley, \$93,476.85; Meyer-Rosenbergs, San Francisco, \$91,501.10; Isbell Const. Co., Carson City, \$99,815; R. L. Oakley, Palo Alto, \$108,096; Smith Bros., Eureka, \$85,580; J. P. Holland, Inc., San Francisco, \$91,601.80; A. D. Drum, Jr., Fallon, \$69,933. Contract awarded to Doverl and Co., and J. A. Maddox, Klamath Falls, \$68,213.20.

LASSEN COUNTY—Bet. Susanville and 2 miles west of Milford, about 19.4 miles to be surfaced with untreated crushed gravel or stone and crushed gravel or stone screenings to be stockpiled. Dist. II, Rt. 29, Sec. C-D. Mathews Construction Co., Sacramento, \$51,987.50; Hemstreet & Bell, Marysville, \$54,712; Milne & Dussault, Portland, \$46,446; Smith Bros., Eureka, \$53,311.20; W. J. Taylor, Palo Alto, \$47,763.68; A. D. Drumm, Jr., Fallon, \$49,686; Tieslau Bros., Berkeley, \$55,046. Contract awarded to Hein Bros. and Chittenden, Napa and Petaluma, \$38,536.90.

MADERA COUNTY—About 4.1 miles to be graded and paved with Portland cement concrete between Berenda and Califa. Dist. VI, Rt. 4, Sec. B-C. C. W. Wood, Stockton, \$182,182; W. A. Dontanville, Salinas, \$188,633; Hanrahan Co., San Francisco, \$169,968; Matich Bros., Elsinore, \$169,318; Wells and Bressler, Santa Ana, \$200,167; Sander Pearson, Santa Monica, \$184,083; John Jurkovich, Fresno, \$171,905. Contract awarded to Valley Paving & Const. Co., Visalia, \$164,511.10.

MARIN COUNTY—A bridge across Novato Creek, about 1 mile south of Novato, consisting of four 34-ft. reinforced concrete girder spans on concrete pile bents. Dist. IV, Rt. 1, Sec. A. Ben C. Gerwick, San Francisco, \$30,461; Mathews Const. Co., Sacramento, \$31,-

958; M. B. McGowan, San Francisco, \$32,492; Pan Pacific Piling and Const. Co., Los Angeles, \$38,728; R. L. Oakley, Palo Alto, \$29,135. The Duncanson-Harrelson Co., San Francisco, \$40,914. Contract awarded to W. L. Proctor, Santa Rosa, \$27,961.

MARIN COUNTY—Through the town of San Anselmo, 0.6 of a mile to be surfaced with asphaltic concrete. Dist. IV, Rt. 1, Sec. B. Pacific States Const. Co., \$10,915; P. S. Harless, San Rafael, \$11,534. Contract awarded to A. F. Raisch, San Francisco, \$10,417.

MONO COUNTY—About 3 miles to be graded and surfaced with untreated crushed gravel or stone, between McGee Cr. and Convict Creek. Dist. IX, Rt. 23, Sec. D. A. R. McGrath, La Canada, \$36,241.70. Contract awarded to Montfort and Armstrong, Sacramento, \$26,331.80.

MONTEREY COUNTY—A bridge across Salinas River at San Ardo, consisting of ten 100-ft. steel deck truss spans and seventeen 37-ft. reinforced concrete girder spans. Dist. V, Rt. 2, Sec. H. Lynch-Cannon Engr. Co., Los Angeles, \$276,128; M. B. McGowan, San Francisco, \$340,505; Butte Const. Co., San Francisco, \$253,875; Pan Pacific Piling & Const. Co., Los Angeles, \$245,749; Rocca and Colletti, San Rafael, \$267,432; Lord and Bishop, Oroville, \$276,053; A. W. Kitchen, San Francisco, \$260,252; Healy-Tibbitts Const. Co., San Francisco, \$259,541; McWilliams and Ritchey, Los Angeles, \$255,692. Contract awarded to Ben C. Gerwick, Inc., San Francisco, \$233,107.

MONTEREY COUNTY—Bet. Chualar and Salinas, 10.3 miles to be graded and paved with asphalt concrete. Dist. V, Rt. 2, Sec. B. Clark & Henry Const. Co., San Francisco, \$338,594; A. Tiechert & Son, Sacramento, \$287,324; Sam Hunter, Santa Barbara, \$301,683; Western Roads Company, Oakland, \$261,395; Granite Const. Co., Watsonville, \$247,520; Force, Curigan and McLeod, Oakland, \$289,630; A. J. Raisch, San Jose, \$313,748; Steele Finley, Santa Ana, \$282,937; George R. Curtis Paving Co., Los Angeles, \$263,326; Fred W. Nighbert, Bakersfield, \$309,448; Union Paving Co., San Francisco, \$278,443; Cornwall Const. Co., Santa Barbara, \$307,926; Valley Paving & Const. Co., Visalia, \$257,210; Hanrahan Co., San Francisco, \$243,036. Contract awarded to Peninsula Paving Co., San Francisco, \$236,484.85.

MONTEREY COUNTY—14 miles south of Carmel, a timber bridge across Little Sur River. Dist. V, Rt. 55, Sec. G. C. C. Gildersleeve, Felton, \$31,170; M. B. McGowan, San Francisco, \$27,777; Edward G. Hart, San Francisco, \$21,336; M. J. Murphy, Carmel, \$28,847. Contract awarded to Lord and Bishop, Oroville, \$27,454.

ORANGE COUNTY—Bet. Santa Ana and Anaheim, 4.9 miles to be paved with Portland cement concrete. Dist. VII, Rt. 2, Sec. D. Matich Bros., Elsinore, \$208,072; E. Paul Ford, San Diego, \$199,685; Geo. Herz & Co., San Bernardino, \$195,649; Jahn and Bressler, Los Angeles, \$192,393; Sander Pearson, Santa Monica, \$223,297; Wells & Bressler, Santa Ana, \$194,846. The Western Const. Co., Los Angeles, \$241,784. Contract awarded to Griffith Co., Los Angeles, \$184,301.

PLACER COUNTY—At Magra, 1.5 miles to be graded and surfaced with crusher run base bituminous surface treated. Dist. III, Rt. 37, Sec. D. C. W. Wood, Stockton, \$24,782. Contract awarded to Tieslau Bros., Berkeley, \$22,836.

PLACER-NEVADA COUNTIES—Bet. Airport and Indian Springs, 9.3 miles to be graded. Dist. III, Rt. 27, Sec. E-A. J. M. DeLuca, Oakland, \$599,519; Jasper Stacy Co., San Francisco, \$690,937; Isbell Const. Co., Carson City, \$477,685; S. H. Palmer Co., San Francisco, \$409,200; Guy T. Atkinson, San Francisco, \$722,091; J. P. Holland, Inc., San Francisco, \$714,645; Nevada Contracting Co., Fallon, \$396,610. Contract awarded to T. E. Connolly, San Francisco, \$396,385.

SACRAMENTO COUNTY—A bridge across Cosumnes River with timber approaches, and two bridges across overflow channels. Dist. X, Rt. 4, Sec. A. A. W. Kitchen, San Francisco, \$138,873; Healy-Tibbitts Const. Co., San Francisco, \$163,959; M. B. McGowan, San Francisco, \$148,172; Mathews Const. Co., Sacramento, \$158,227; Frederickson & Watson Const. Co., Oakland, \$128,280; George J. Ulrich Const. Co., Modesto, \$129,955; Ben C. Gerwick, Inc., San Francisco, \$132,121; Lord & Bishop, Oroville, \$141,994; E. B. Skeels, Roseville, \$155,598. Contract awarded to Griffith-Hunter, Inc., Sacramento, \$126,850.50.

SACRAMENTO COUNTY—Bet. Arno and McConnell, 1.2 miles to be graded and surfaced with untreated crushed gravel or stone. Dist. X, Rt. 4, Sec. A. A. Tiechert & Son, Inc., Sacramento, \$93,279; Gannon and McCarty, Stockton, \$72,503; C. T. Malcolm, Walnut Creek, \$71,454; J. E. Johnston, Stockton, \$84,943; Hemstreet and Bell, Marysville, \$64,452; Charles Miles, Sacramento, \$77,749; Frederickson and Watson Const.

Co., \$71,546. Contract awarded to Larsen Bros., Sonoma, \$57,098.50.

SACRAMENTO COUNTY—Reinforced concrete girder bridge across Arcade Creek, 11 miles east of Sacramento on the Auburn route. Dist. III, Rt. 3, Sec. B. The Adams Co., Angels Camp, \$17,693; E. B. Skeels, Roseville, Cal., \$14,784; Lord and Bishop, Oroville, \$15,268; Frederickson and Watson Co., Oakland, \$13,361. Contract awarded to Geo. J. Ulrich Const. Co., Modesto, \$13,131.

SAN BERNARDINO COUNTY—Two reinforced concrete bridges, one across San Antonio Cr. at Pomona, and one across Collins Dip, 4 miles east of Ontario. Dist. VIII, Rt. 19, Sec. A-B. Whipple Engr. Co., Monrovia, \$34,942; Oberg Bros., Los Angeles, \$42,604; DeWaard & Son, San Diego, \$38,067; Storm & Mahoney, Inc., Pomona, \$38,838; George Herz & Company, San Bernardino, \$34,528; E. M. Funk, Santa Ana, \$42,220; Orvall Schubach, Riverside, \$36,211; Byerts and Dunn, Los Angeles, \$37,676; Franklin E. Gridley, Pasadena, \$43,411; E. S. Johnson, Pasadena, \$36,758. Contract awarded to W. J. Netherer & Sons, \$23,170.65.

SAN BERNARDINO COUNTY—At Barstow, an overhead crossing over the A., T. & S. P. Dist. VIII, Rt. 58, Sec. D. Mercer-Fraser Co., Eureka, \$175,253; C. M. Elliott, Pasadena, \$158,856; Sharp & Fellows, Los Angeles, \$143,529; Chas. U. Heuser, Glendale, \$181,105; E. S. Johnson, Pasadena, \$187,067; M. B. McGowan, San Francisco, \$170,827; Obert Bros., Los Angeles, \$17,575; Ben D. Gerwick, San Francisco, \$167,011. Contract awarded to Lynch-Cannon Engr. Co., Los Angeles, \$155,381.

SAN BERNARDINO COUNTY—Bet. San Bernardino and Santa Ana River bridge, 1.7 miles to be graded and paved with Portland cement concrete. Dist. VIII, Rt. 26, Sec. A. Match Bros., Elsinore, \$62,268; William D. Bohan, San Bernardino, \$79,693. Contract awarded to George Herz & Co., San Bernardino, \$60,846.40.

SAN DIEGO COUNTY—Bet. Kitchen Creek and La Posta, about 3.9 miles to be graded and paved with Portland cement concrete. Dist. VII, Rt. 12, Sec. F. R. E. Hazard Contracting Co., San Diego, \$197,022. Contract awarded to Basich Bros. Const. Co., Los Angeles, \$186,446.

SAN JOAQUIN COUNTY—Bet. Banta and San Joaquin River, 3.1 miles to be graded and paved with Portland cement concrete. Dist. X, Rt. 5, Sec. B. Hanrahan Co., San Francisco, \$144,892; Prentiss Paving Co., San Jose, \$152,598; Lewis Moreing, Sacramento, \$153,087; Frederickson & Watson, Oakland, \$149,831; W. A. Dontanville, Salinas, \$156,491. Contract awarded to C. W. Wood, Stockton, \$141,525.

SAN LUIS OBISPO COUNTY—Bet. Estrella River and Sacramento Ranch, 5.2 miles to be graded and surfaced with bituminous macadam. Dist. V, Rt. 33, Sec. R. Valley Paving Const. Co., Visalia, \$84,444. Contract awarded to A. Teichert & Sons, Inc., Sacramento, \$76,776.90.

SAN LUIS OBISPO COUNTY—About 1 mile north of Cambria, 1 mile to be graded and surfaced with screened gravel. Dist. V, Rt. 56, Sec. B. W. A. Dontanville, Salinas, \$11,488; W. J. Taylor, San Luis Obispo, \$12,588; Ariss-Knapp Co., Oakland, \$12,828. Contract awarded to Tiffany, Reynolds, Tiffany, San Jose, \$9,773.

SAN LUIS OBISPO COUNTY—Bet. Cuesta and 1½ miles south of Santa Margarita, 1.9 miles to be graded and paved with Portland cement concrete. Dist. V, Rt. 2, Sec. D. C. T. Malcom, Walnut Creek, 197,376; Cornwall Const. Co., Santa Barbara, \$99,275; Prentiss Paving Company, San Jose, \$98,575; W. A. Dontanville, Salinas, \$99,929; Granite Const. Co., Watsonville, \$97,699. Contract awarded to M. J. Bevanda, Stockton.

SAN LUIS OBISPO COUNTY—Reinforced concrete girder bridge across Graves Creek about 2 miles south of Templeton. Dist. V, Rt. 2, Sec. B. John A. Webster, Lodi, \$12,663; C. C. Gildersleeve, Felton, \$11,534; San Atos Const. Co., San Luis Obispo, \$11,316; Theo. M. Maino, San Luis Obispo, \$39,340. Contract awarded to William Lane, Paso Robles, \$10,977.50.

SAN LUIS OBISPO COUNTY—At Yerba Buena Creek, just north of Santa Margarita, 0.2 of a mile of grading and crushed stone surfacing and one timber bridge. Dist. V, Rt. 2, Sec. C. E. D. Jarvis and W. H. Porter, San Luis Obispo, \$19,907; W. J. Taylor, Palo Alto, \$19,347. Contract awarded to M. J. Bevanda, Stockton, \$9,808.30.

SHASTA COUNTY—About 5 miles south of Castella, a reinforced concrete girder bridge across Mears Creek. Dist. II, Rt. 2, Sec. D. J. P. Brennan, Redding, \$26,237; E. M. and Edgar Noble, Marysville, \$25,990; Lord and Bishop, Oroville, \$26,110. Contract Carlson Bros., Turlock, \$19,978.98.

SISKIYOU COUNTY—Bridge across Shasta River about 5 miles north of Yreka. Dist. II, Rt. 3, Sec. C. R. B. McKenzie, Gerber, \$31,798; Lord & Bishop, Oroville, \$31,020; George J. Ulrich Const. Co., Modesto, \$34,612. Contract awarded to M. B. McGowan, San Francisco, \$23,411.25.

SISKIYOU COUNTY—Bet. the Klamath River and the Oregon line, 14.5 miles to be treated with bituminous surfacing. Dist. II, Rt. 3, Sec. C. George French, Jr., Stockton, \$17,332; J. C. Compton, McMinnville, Ore., \$18,294. Contract awarded to Jack Casson, Hayward, \$13,903.50.

TEHAMA AND SHASTA COUNTIES—Near Cottonwood, a reinforced concrete girder bridge across Cottonwood Creek. Dist. II, Rt. 3, Sec. C-A. M. B. McGowan, San Francisco, \$171,937; Healy-Tibbitts Const. Co., San Francisco, \$188,580; G. W. Kitchen, San Francisco, \$223,523; Lord and Bishop, Oroville, \$184,821; George J. Ulrich, Modesto, \$174,225; Rocca & Coletti, San Rafael, \$199,388; E. B. Skeels, Roseville, \$213,403; Northwest Contracting Co., Portland, \$176,860; Pan Pacific Piling and Const. Co. Los Angeles, \$168,234. Contract awarded to Badenhamer Const. Co., San Diego, \$159,827.

Road Financing in Other States

State highway financing occupied the attention of a number of state legislatures this year.

South Carolina has increased its gas tax from 5 to 6 cents, Indiana and Montana from 3 to 4, Kansas and North Dakota from 2 to 3. South Carolina and Arkansas have both voted to borrow money for enlarged construction programs.

The Arkansas legislature has authorized state expenditures of \$65,743,166.70 for highways during the next two years. A higher license and a 5-cent gas tax will bring \$22,000,000 for the biennium and federal aid \$2,500,000. The balance will come from sale of "highway notes."

The South Carolina legislature voted to issue \$65,000,000 bonds for a four-year highway construction program. Gas and auto taxes will be used to retire the bonds.

The Iowa legislature is working on plans to keep the road program in that state going. The \$100,000,000 bond bill adopted by the voters last November has been held unconstitutional.

Recent gas tax increases leave the roll of states as follows:

Six cents, one state: South Carolina.

Five cents, six state: Arkansas, Florida, Kentucky, Mississippi, New Mexico, Virginia.

Four cents, fourteen states: Alabama, Arizona, Georgia, Idaho, Indiana, Louisiana, Maine, Maryland, Montana, Nevada, New Hampshire, North Carolina, South Dakota, West Virginia.

Three and one-half cents, Utah.

Three cents, fifteen states: California, Colorado, Delaware, Iowa, Kansas, Michigan, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, Vermont, Wyoming.

Two cents, nine states: Connecticut, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Rhode Island, Washington, Wisconsin. Also the District of Columbia.

WISCONSIN—Many patrol sections on state gravel roads are to be shortened to permit more intensified maintenance. Fifteen miles is considered the maximum that a motor patrol outfit can cover and keep down "washboards." The state employed 980 patrolmen during 1928.

"In trouble?" asked a passing motorist of a couple in a coupe beside the road on a moonlight night.

"Nope," came the reply, "in love."

"Well, it's the same thing." And the interrupting motorist drove on.

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



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