

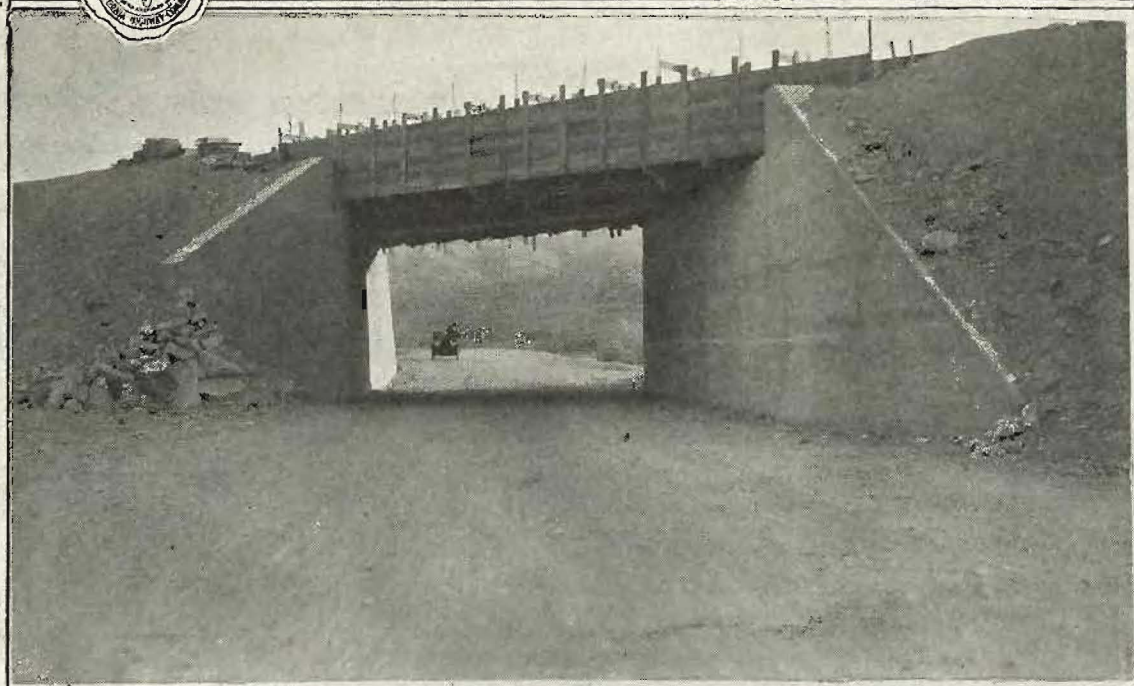
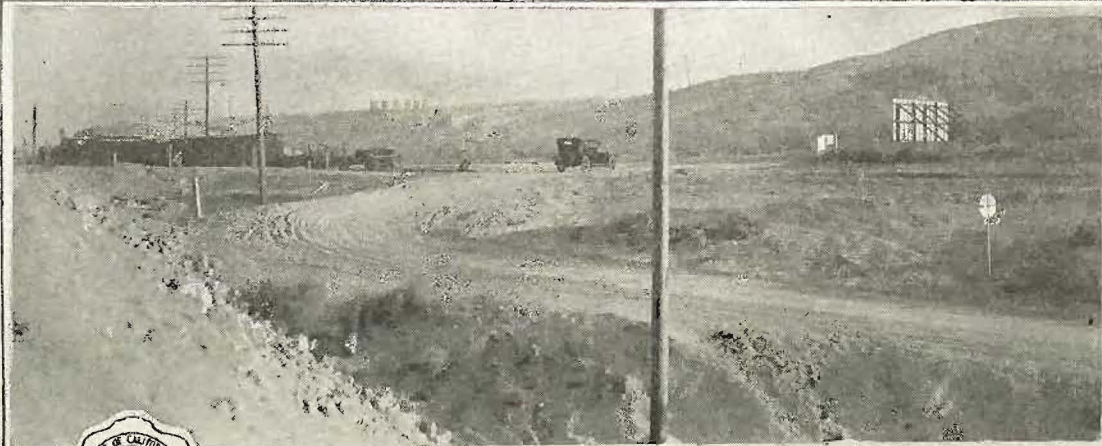
CALIFORNIA HIGHWAYS

OFFICIAL PUBLICATION OF THE CALIFORNIA HIGHWAY COMMISSION

Vol. 2

MARCH, 1925

No. 3



UNDERPASS AT ORO GRANDE ON THE NATIONAL OLD TRAILS HIGHWAY—This splendid new improvement substitutes for a dangerous grade crossing on a sharp curve over the tracks of the Santa Fe railroad a wide underpass. Considerable widening and straightening of the state highway has been done in San Bernardino County in conjunction with similar straightening of the railroad line. (Division VIII.) See article on page nine.

California Highway Department

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Federal Aid for Highways Should Be Continued

THE FEDERAL GOVERNMENT has undertaken to aid the states in building a system of main arterial highways for the nation and it is to the interest of every citizen to see that the work is continued. Federal aid has been very largely responsible for the remarkable progress in road construction in recent years. Initiated in 1916, when only a few states were actively improving roads and many of them without a highway department or a definite program for financing or construction, it has been the incentive for the establishment and strengthening of highway departments and the general progressive movement in highway construction.

At the present time a system of approximately 170,000 miles has been designated for improvement with federal aid. This in itself is no small accomplishment since differences of opinion over the selection of highways for improvement are always to be encountered. On November 30th, this year, 36,000 miles had been completed with federal aid and nearly 19,000 miles were under construction. Since 1921 construction has progressed smoothly at the rate of from eight to ten thousand miles a year and additional mileage has been constructed independent of federal aid. It is estimated that about ten years will be required to complete this primary system.

The problem before us is very definite. If we want a complete system of main highways connecting each state of our country, federal aid must be continued. Without its incentive some of the states will lag behind. In some of the western states it is more than

an incentive—it is essential that the limited resources of these sparsely settled commonwealths be supplemented by federal aid in order that the main transcontinental roads may be completed.

We have gone too far with this plan to lay down the pick and shovel now. Experience in every state advanced in highway construction shows that the greatest benefit and satisfaction on the part of the public is not felt until the gaps in the main roads begin to close. We are just now beginning to close the gaps in important routes in most of the states.

Experience has shown that the saving in fuel alone makes it cheaper to improve our main roads than not to improve them. Highway traffic has developed far beyond anything anticipated a few years ago. There is not a community in the country which does not or will not derive benefit from improved highway transportation. In the months of heaviest traffic the motor vehicles alone of the country travel a daily average of 300,000,000 miles. A very large proportion of this traffic is concentrated on the routes of the federal aid highway system and since the need already exists construction should proceed as fast as resources in the shape of labor and materials permit.

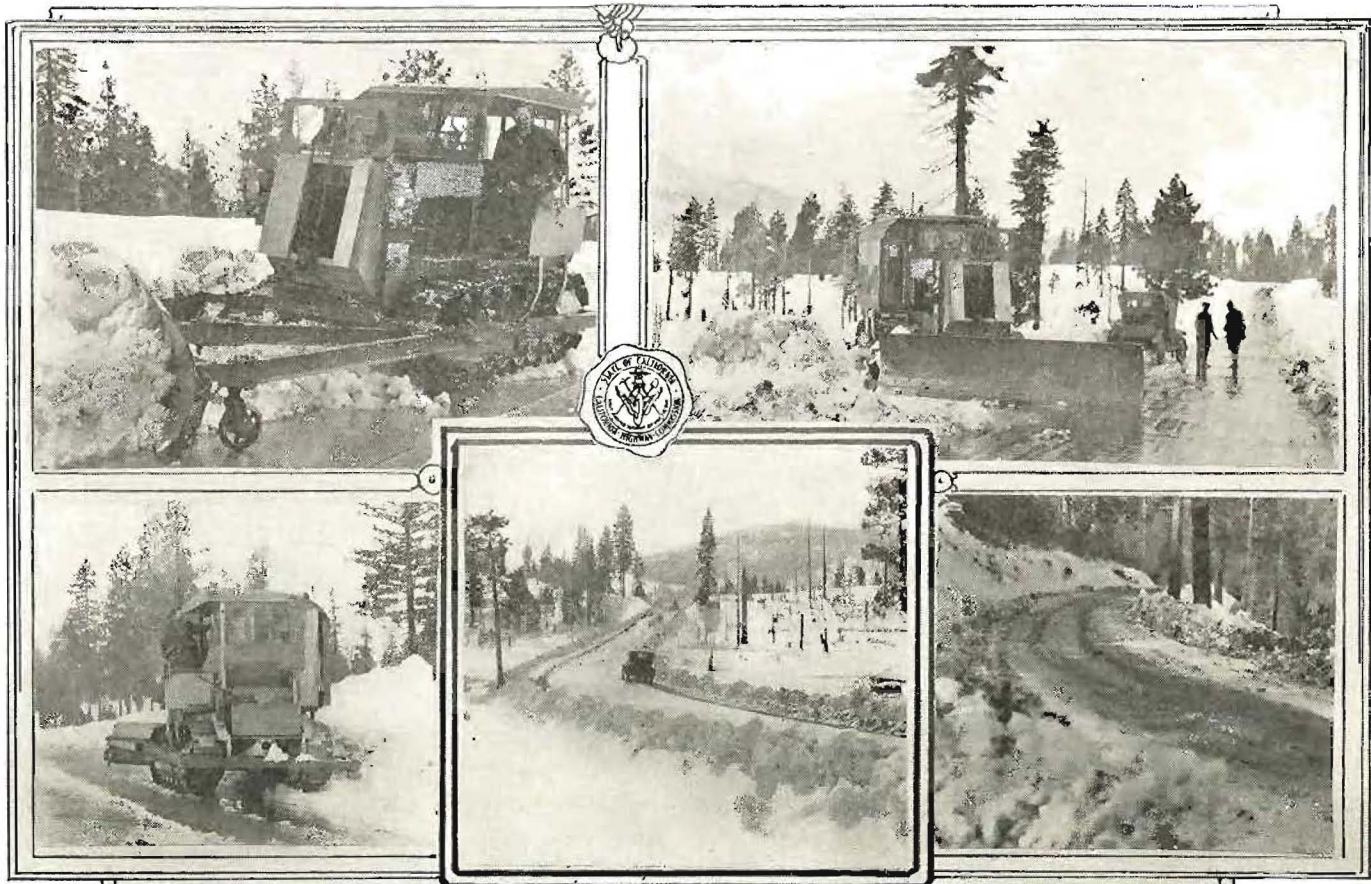
Having been largely instrumental in bringing about federal aid to highways, the American Automobile Association will use every legitimate effort to expedite the completion of this great system which, when finished, will be a third greater than the national highway systems of all the other nations in the world combined.

AMERICAN AUTOMOBILE ASSOCIATION

GOOD ROADS BOARD
Richard Haldeman, *Chairman*

THOMAS P. HENRY,
President

SNOW REMOVAL KEEPS PACIFIC HIGHWAY OPEN DURING WINTER



SCENES IN SISKIYOU COUNTY DURING RECENT WEEKS—Upper left, state highway snow plow bucking drifts; upper right, a close up view of the equipment in service; lower left, equipment in action; lower center, paved highway in vicinity of Mount Shasta City cleared of snow; lower right, snow removal on a rock surface highway in cooperation with county. View taken on Fredonia Pass, Susanville lateral, Lassen County. Gasoline tax money removes the snow. (Division II.)

STUDY OF SNOW CONDITIONS ON STATE ROADS IS UNDERTAKEN

IT IS PROBABLE that more systematic snow removal work has been done on the state highway system, particularly in Division II, during the past winter than at any other time since improvement of the system made such work possible or practical.

The most important work of this kind was the clearing of the Pacific highway in the vicinity of Weed and Mount Shasta City, although drifts were removed from the pavement at numerous places north of Dunsmuir. The past winter also witnessed the extension of the snow removal program to the Susanville, Alturas and Weaverville laterals.

The state highways from Redding to Weaverville and from Redding to Alturas were kept open during the entire winter. The Susanville lateral between Susanville and Westwood, through Fredonia Pass, was open most of the winter, the state furnishing the equipment and the county doing the actual work.

Division VIII also has done some snow removal work on the highway from San Bernardino into the Big Bear Lake country.

Woodland Man Sends Pictures.

The photographs of snow removal work on the Pacific highway, reproduced above, were sent Secretary F. W. Mixon by H. W. Laugenour of Woodland, accompanied by this note:

"FRIEND FRANK: Just made a few pictures of your snow plow and its work. Am sending you a set so you will know your boys are going to it and doing good work."

Heretofore, snow removal has been charged to general maintenance. Beginning this winter, the cost of this work is being determined as a separate item for future consideration.

Studies of snow conditions throughout the state highway system were inaugurated during the recent winter and within a few years much snow data will be compiled. The equipment department is doing its share by keeping in close touch with all the latest snow removal equipment on the market and methods in use in eastern states where snow removal from hard surfaced pavements has become an annual winter program in many places.

OUTSTANDING PAVEMENTS COMPLETED UNDER THE 1924 PROGRAM

By EARL WINTHCOMBE, Assistant Engineer, Construction Department.

RESULTS obtained with all types of pavements constructed in 1924 reflect considerable well earned credit to the field men of the California Highway Commission in their efforts to secure a stronger and better product.

Quality of newly constructed pavements is judged largely by laboratory tests of samples of the finished product and by field surveys of the condition of the project, during and after construction.

The laboratory, at all times, exerts a rigid control over materials used in the building of the highways and their suitability for pavement construction is determined prior to delivery on the job. Specimens of the finished mix, as it is ready to be incorporated into the pavement, are forwarded daily to the laboratory and the analyses of these samples are returned to the resident engineer as quickly as possible with comments attached for guidance of the field men in the control of ingredients.

What Tests Are Made.

Asphalt mixtures are analyzed for grading of aggregate, quantity and quality of asphaltic cement and density of the mixture. Cement concrete mixtures are tested for compressive strength of specimens at the age of ten and twenty-eight days. The ten-day breaks are for the immediate guidance of the field men, and are a preliminary indicator of the ultimate strength to be expected. The twenty-eight day breaks are accepted as the true indicator of the ultimate strength.

The weight per cubic foot of the specimen is determined to indicate the density of the concrete and any apparent oversanding or overwatering of the mixture is noted on the laboratory report. These construction specimens of both asphaltic and cement concrete are frequently augmented by samples cut from the completed work, subsequent to construction, and a recheck made of the completed project.

Field surveys are made under the direction of headquarters and consist of inspection during the course of construction and subsequent conditional surveys to determine the action of the pavements under traffic.

Vialog Makes Graphic Check.

The riding qualities of pavements are determined by a graphic chart of the surface irregularities as recorded by the Vialog, a device recently adopted by the department for measuring the roughness or smoothness of road surfaces.

This interesting little machine is installed in a touring car. Its two indicator arms, operating pencil points over a moving graph, are directly connected to the two front springs of the automobile and spring deflections caused by irregularities in the pavement surface are automatically recorded. The graph is driven from a gear connected with a speedometer cable, and in addition to this graph, an indicator records the summation of spring deflections in roughness units.

Vialog records are taken during construction as a guide for the betterment of the work and again at completion as a permanent record. Subsequent records will be made at intervals to determine the performance of the pavement under traffic.

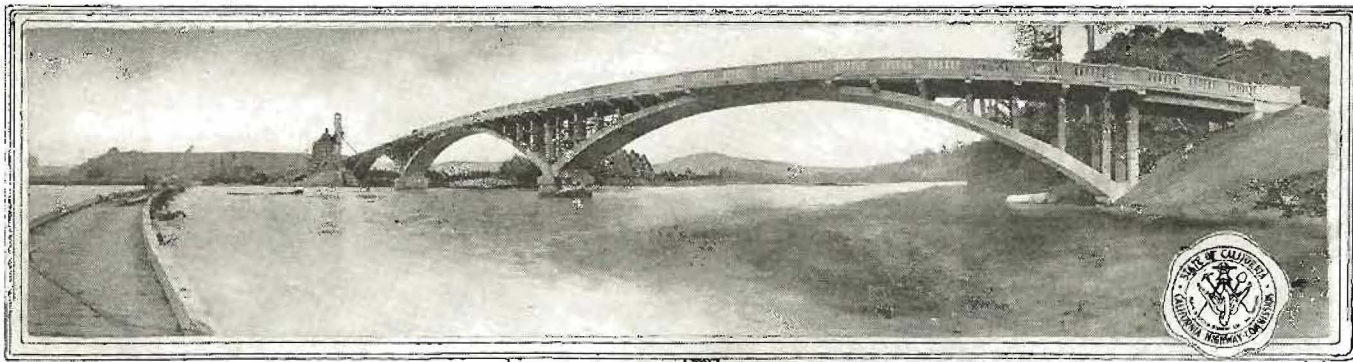
Conditional surveys of concrete pavements are made shortly after the project is thrown open to traffic and a chart made of all transverse and longitudinal cracks. This survey will be progressive from year to year and developments noted.

In order to procure a uniform cement ratio, cement concrete is being proportioned by the relation of a specified number of sacks of cement to a cubic yard of mixed concrete, rather than the relation of the volume of cement to the volume of fine and coarse aggregate. This relation of cement to mixed concrete is varied by altering the proportion of either the fine or coarse aggregate, and, on work where aggregate gradings fluctuate at short intervals, considerable care must be exercised to avoid an under or over run of the cement content. The efficiency of the inspection is judged largely by this feature.

The Best Pavements of 1924.

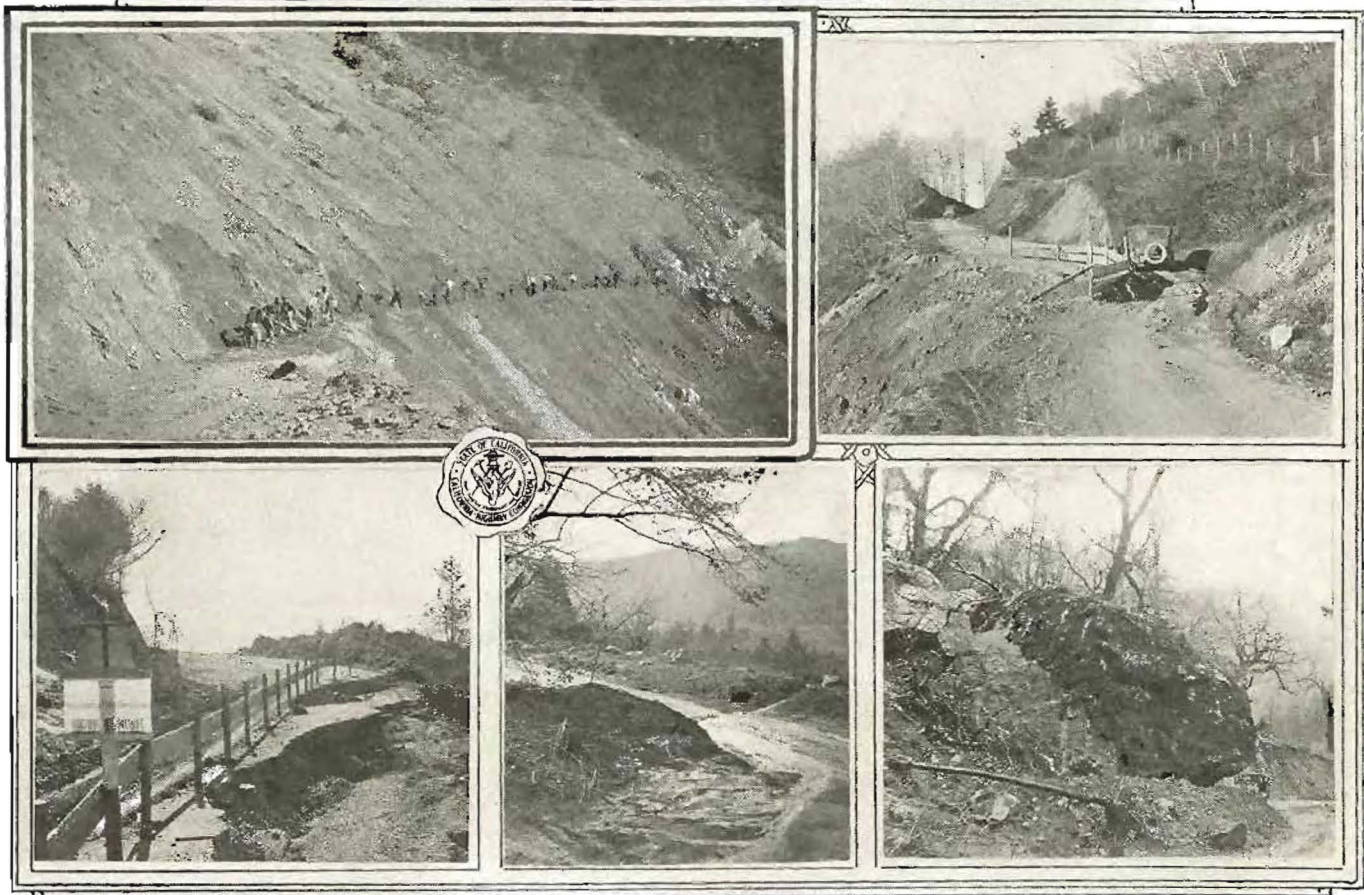
Of the cement concrete pavements constructed during 1924, the low record of 8.9 inches of roughness per mile was made on Contract 435. Other projects went as high as

(Continued on page 7.)



NEW STATE HIGHWAY BRIDGE OVER THE VAN DUZEN RIVER, HUMBOLDT COUNTY—This magnificent structure, 734 feet in length, is a Redwood highway improvement thrown open to traffic during March. It takes the place of an old county-built bridge which long ago became inadequate for traffic. At the left, is the temporary pile bridge constructed as a detour to handle traffic during construction. The railroad bridge, which parallels the state highway structure at this point, has been blocked out of the picture which was taken during a recent flood. (Photo by Paul D. Towne, Ferndale.)

REMOVAL OF SLIDES ON REDWOOD ROUTE TO COST \$100,000



WHAT HEAVY RAINS HAVE DONE TO THE REDWOOD HIGHWAY—Upper left, "The big slide," view in Del Norte County, where several hundred feet of the highway has been entirely swept away; upper right, most of the roadbed gone, traffic still being maintained; lower left, a section of the highway slowly sinking; lower center and right, entire trees and huge boulders slide into the road. Gasoline tax money will remove these slides.

STRENUOUS WORK OF MAINTENANCE FORCES KEEPS HIGHWAY OPEN

AN EXPENDITURE of \$100,000 of maintenance funds will be necessary to remove slides and make repairs on the Redwood highway in Mendocino, Humboldt and Del Norte counties. This is the estimate of Division Engineer T. A. Bedford after a survey of the serious damage done by the torrential rains that have been falling during the winter months in the northwest coast counties.

The rainfall for the season at Willits is now 50 inches, while in many sections of Del Norte County it has reached 70 inches. And the end is not yet.

Slides in Division I, to the middle of March, numbered 150. Twenty-seven large trees, some of them up to ten feet in diameter, had fallen across the highway, requiring much labor and powder to cut and blast a roadway of sufficient width to permit traffic to get through.

150,000 Cubic Yards in Slides.

On March 15th, Mr. Bedford estimated the slides had reached a total of 150,000 cubic yards, with more coming in after each rain. At that time, he had three power shovels and every available maintenance man at work clearing the road-

way. These strenuous efforts are keeping the Redwood highway open to traffic throughout its entire length, at least a part of each day.

The Division Engineer has the highest praise for the maintenance crews and the valiant fight they are making to keep traffic moving.

Many of the slides in the Redwood section are the worst in years. In places, the entire roadbed has been carried away; in others, huge boulders and trees of great size, loosened by the continued rains, have crashed down mountain sides completely filling the highway.

Unique Methods Used.

Removal of slides is being handled economically in some places in the division by making use of available water and sluicing the earth in the slides across the highway. In one place, a giant monitor, such as was used in early day hydraulic mines, is being operated effectively in slide removal work at low cost.

While the situation is difficult, it is viewed as a part of the job and the work of clearing away the debris and repairing the damage goes steadily forward.

Engineer Reviews Outstanding Paving Projects of 1924

(Continued from page 5.)

30½ inches. Contract 435, which also carries the best average compressive strength for a Class A pavement, is 3.52 miles of 20-foot concrete pavement constructed in Orange County between Huntington Beach and Corona Del Mar, C. P. Montgomery, resident engineer.

The low average for asphaltic concrete was obtained on Contract M42, being 17 inches per mile. Other work for the season ran as high as 37 inches. Contract M42 is 2.78 miles of asphaltic surface on concrete base in Los Angeles County, Pasadena Avenue to Montebello, on the Whittier boulevard. H. C. Reeder, resident engineer.

An average compressive strength of 3950 pounds per square inch for 28-day specimens of cement concrete was obtained on Contract 435. Other projects went as low as 2680 pounds per square inch. Of Class A concrete shoulder work, Contract M54 carries an average of 4200 pounds per square inch and other work went as low as 3310 pounds. Contract M54 is 3.96 miles of flush concrete shoulders in Solano County, Rockville to Fairfield. F. C. Hewitt, resident engineer.

Cement Control.

Totals for the accumulative daily over and under runs of sacks of cement, expressed in percentages of the theoretical

amount to be used on the project, is used as a basis for comparing the efficiency of cement control. The low variation of 1.2 per cent was obtained on Contract 431, and for other pavement work ran as high as 2.9 per cent. Contract 431 is 9.88 miles of Class A concrete pavement in Shasta County, Redding to Bayha. B. H. Henry, resident engineer. Of the flush concrete shoulder projects, Contract M54, in Solano County, has the low cement variation of 1.4 per cent.

Of the pavement surveyed to date, Contract 435, in Orange County, has the low average for contraction cracks, having 37 joints and cracks per mile. Other pavements have as many as 200 per mile.

The best progress made on cement concrete pavements for the year was on Contract M39, Los Angeles County, where 21,787 cubic yards of concrete were placed in 110 days or a daily average of 198 cubic yards. Geo. H. Oswald of Los Angeles was contractor.

The best progress on asphaltic concrete pavements was on Contract M56, San Joaquin County, where 24,400 tons of asphaltic concrete were laid in 100 days, or an average of 244 tons per day. The Valley Paving and Construction Company of Visalia were the contractors.

OUTSTANDING CONCRETE PAVING IN 1924.

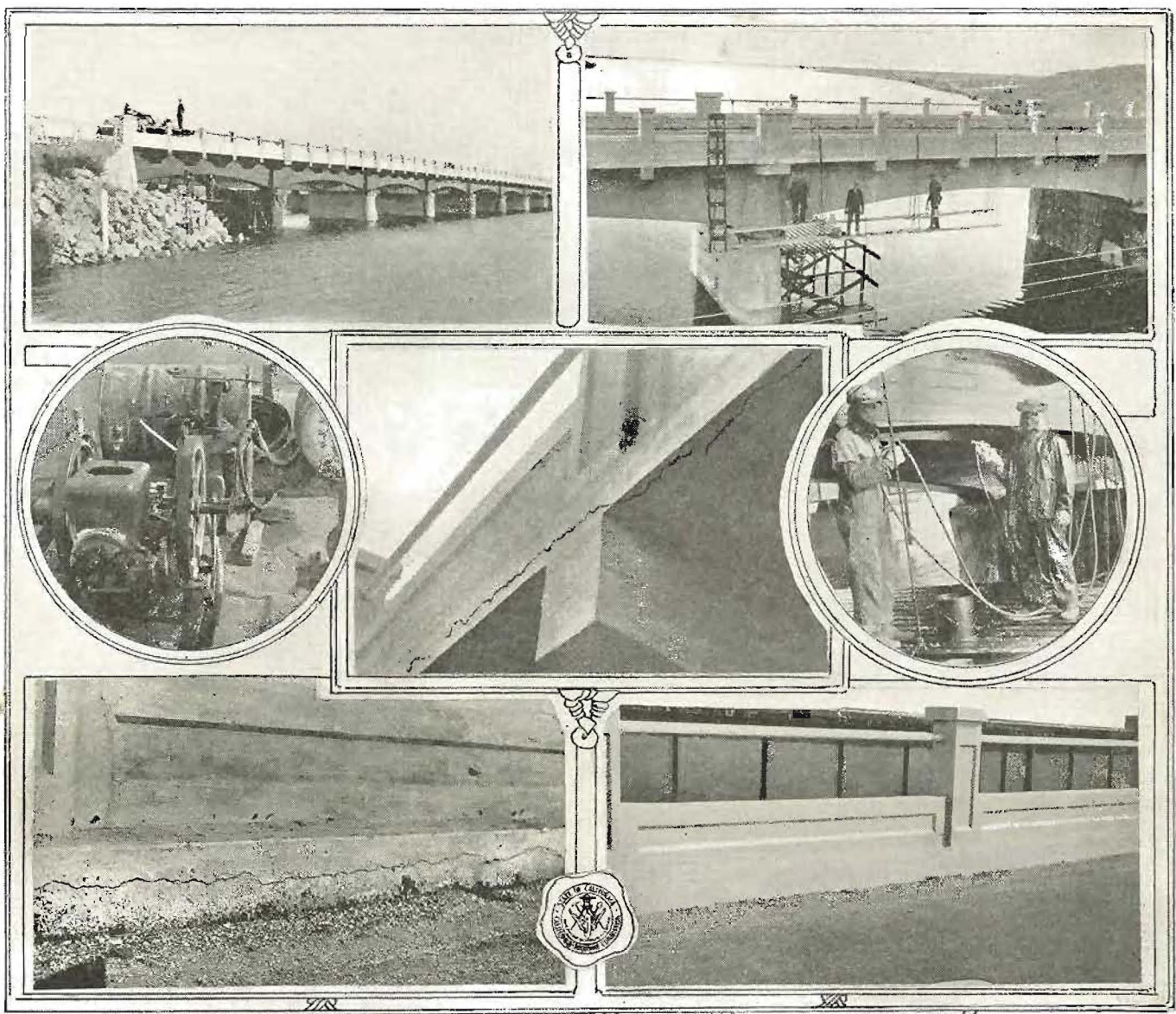
Contract number	Location	Contractor	Resident engineer	Average strength of concrete at 28 days, pounds	Vallog index of roughness, units per mile	Cracks per mile	Average yardage placed per day	Average variation in cement used per day, per cent
435	Huntington Beach to Corona Del Mar.	W. F. Beal	C. P. Montgomery	3,950	8.9	37	107	1.3
431	Redding to Bayha	Kaiser Paving Company	B. H. Henry	3,340	12.2	124	167	1.2
433	Beltane to Schellville	Galbraith and Janes	N. H. Nelson	3,230	15.4	200	147	1.6
M-39	Shoup Avenue to Westerly Boundary	Geo. H. Oswald	C. N. Ainley	3,220	30.6	136	198	1.9
M-36	San Diego to Oceanside	Jahn and Bressi	A. N. George	3,530	15.9	51	161	1.6

Flush Concrete Shoulders.

M-52	Greenville to Livermore	W. A. Dontanville	M. C. Fosgate	3,310			60	2.2
M-54	Fairfield to Rockville	Tibbals, Percival and Cress	F. C. Hewitt	4,200			32	1.4

OUTSTANDING ASPHALT SURFACING—1924.

Contract number	Location	Contractor	Resident engineer	Vallog index of roughness, units per mile	Average specific gravity	Average daily tonnage
M-44	Vacaville to Batavia	Force and Currigan	H. O. Ragan	35.8	2.43	194
M-56	Westerly Boundary—Banta	Valley Paving and Constr. Co.	C. O. Dingle	28.8	2.43	244
M-41	Coyote Creek to Milpitas	Federal Paving Company	E. J. Brown	23.2	2.54	143
M-42	Pasadena Avenue—Montebello	Geo. H. Oswald	H. C. Reeder	17.3	2.37	98



WATERPROOFING THE SANTA MARGARITA BRIDGE ON THE COAST HIGHWAY NORTH OF OCEANSIDE—Methods used to protect a concrete bridge in San Diego County from moisture and the salt air of the nearby ocean. Upper left, girders after application of Petrolastic cement; upper right, men at work and type of scaffolding used. The center views show cracks in deck of the bridge caused by expansion of rusting steel reinforcing rods and the paint spraying machines used in applying cement; lower views, cracks in wheel guard and railing caused by rusting of reinforcing steel and the same rail after painting with Stone Tex damp proof paint. Existing cracks were filled with Stone Tex crack filler.

Waterproofing a Reinforced Concrete Highway Bridge

By E. T. SCOTT, Maintenance Superintendent, Division VII.

THE APPEARANCE of numerous cracks in the girders, deck and railing of the Santa Margarita River bridge on the Coast highway, north of Oceanside, San Diego County, made it necessary to waterproof this structure to prevent further deterioration.

Located on the ocean front and spanning tide water, the Santa Margarita bridge is at all times subject to moisture and salt sea air. These penetrated the concrete, causing the reinforcing steel bars imbedded in the structure to rust. The formation of a coating of rust on the reinforcing steel resulted in tremendous swelling, due to the increased volume of rust over that of steel. The breaking and cracking of the concrete, which is not of the quality now required on state highway bridges, was the result.

After a careful investigation, it was found advisable to waterproof the bridge in its entirety. Visible portions of the structure were painted with Stone Tex, a damp-proof paint with a dull-toned finish, a close counter-part of concrete. Girders and the under part of the bridge were treated with petrolastic cement, an air blown asphalt having more elasticity than steam blown asphalt.

How the Work Was Done.

Petrolastic cement was applied with a paint spraying outfit, operating two "Crown" air brushes. The air brush work was done first to avoid the possibility of spattering with the black petrolastic cement any of the hand-painted surface.

(Continued on next page.)

Dangerous Grade Crossing Eliminated on Old Trails Highway

Cooperated With Railroad.

IN COOPERATION with the Santa Fe railroad, Division VIII has just completed an important improvement on the National Old Trails highway near the town of Oro Grande between Victorville and Barstow, San Bernardino County. Some three miles of the state highway have been straightened out and graded and a dangerous grade crossing eliminated by the building of an underpass, as illustrated in the views on the front cover.

The Santa Fe Company has been straightening out and double tracking its lines between Los Angeles and the east and an understanding was reached between the commission and the railroad that whenever the work was done in the vicinity of Oro Grande, the state highway would be graded at the same time. The highway followed the winding course of the railroad and crossed it on the curve as described above.

Many accidents have occurred at this point in recent years. The railroad crossed the highway after rounding a sharp curve, and likewise the highway approached the railroad on a sharp turn that entirely concealed the tracks.

The cost of the underpass, which was built by the railroad company, was shared by the railroad and the state. This expenditure and the three miles of grading being entirely new construction was financed from the state highway fund. Both the railroad and the traveling public will benefit from this important improvement.

WATERPROOFING A REINFORCED CONCRETE HIGHWAY BRIDGE

(Continued from page 8.)

In order to obtain the proper consistency for application, the petrolastic cement (received in wooden barrels) was first thinned by heating, and to it added a liquid thinner composed of 75 per cent Mineral Spirits and 25 per cent Benzole. The use of two parts of petrolastic cement to one part of liquid thinner gave the best results.

On most of the bridge, one coat of petrolastic cement was sufficient to fill the cracks and pores in the concrete surface. However, there were several areas that absorbed the paint to such an extent that a second coat had to be applied. Treating with the petrolastic cement resulted in an uniformly smooth and tough waterproof coating. The paint was applied at the rate of approximately $\frac{3}{8}$ gallon per square yard (gross).

Men operating the air brushes stood on staging mounted on a raft which floated under the bridge and was easily moved from place to place. On three spans on the southerly end of the structure, the raft could not be used because of old submerged piles close to the surface of the water. Here a scaffolding was suspended from hooks hung over the bridge railing on each side of the structure.

The piers, not requiring waterproofing, were covered with

canvas to prevent their being spattered by the air brush spraying.

Special Filler for Cracks.

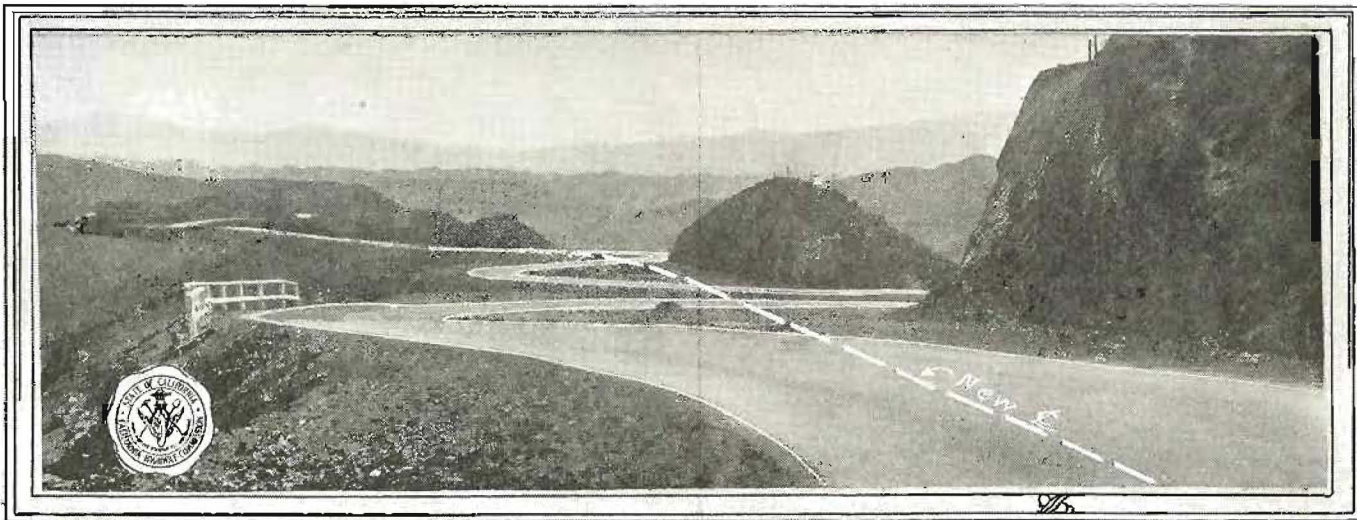
Stone Tex damp-proof paint was applied to the railing and sides of the bridge deck in two coats with hand brushes, after cracks larger than hair cracks had been filled with a special crack filler manufactured for use in connection with Stone Tex paint. For the first or primary coat, the paint was thinned with a special Stone Tex liquid in the proportion of one gallon of liquid to five gallons of paint, and was brushed well into the pores of the concrete.

The first coat of paint was allowed to dry three days and then a second coat of the paint without the addition of the thinner was applied. A gallon of paint covered (two coats) about ten square yards of concrete.

Besides waterproofing the concrete, the paint which has a color approximating very closely that of concrete, has improved the appearance of the bridge.

The painting of the San Luis Rey River bridge at Ocean-side with Stone Tex paint, and the spraying with air brushes of the girders and under portion of the Agua Hodienda Creek bridge with petrolastic cement is now in progress.

E. G. Brassington, maintenance foreman, is in charge of the work.



IMPROVING THE FAMOUS "RIDGE ROUTE"—Calahan line change on the Ridge Route, Los Angeles County, showing how maintenance forces of Division VII have reduced seven sharp curves to two with easy radii. The line shows the center of the highway as it will exist after paving is completed, following settlement of cuts and fills. The gasoline tax provides the funds for this kind of work.

OPENING OF COAST HIGHWAY UNIT CELEBRATION IN SOUTH

AT LAST the barriers which have made it necessary for motorists to travel many miles out of their way in going from Long Beach to Huntington Beach and Newport have been removed and the new pavement and new bridge over Santa Ana River are now open to traffic.

On Saturday, March 21st, the dedication of the bridge took place with Commissioner Nelson T. Edwards officially removing the barrier. Officials of Orange County and of the beach cities joined with representatives of Los Angeles and the Automobile Club of Southern California in celebrating the event.

The city of Newport entertained at a luncheon at the Newport Harbor Yacht Club in celebration of the event.

Both north and south of the new section, construction is under way on the Coast boulevard and the day will come when there will be a continuous pavement all the way along the ocean front from Oxnard to Serra.

The new Santa Ana River bridge was built by Orange County under the joint state and county supervision.

ENGINEER FOR SOUTHERN CLUB PRAISES DESERT MAINTENANCE

DIVISION VIII is in receipt of the following letter from E. E. East, Engineer for the Automobile Club of Southern California, regarding maintenance work being done on the desert sections of the Mecca-Blythe route:

LOS ANGELES, CAL., February 26, 1925.

MR. E. Q. SULLIVAN, Division Engineer,
California Highway Commission,
San Bernardino, California.

MY DEAR SULLIVAN: Again permit me to congratulate you upon the very excellent results which you have been able to obtain through maintenance in your division. In this particular case, I refer to the Mecca-Blythe road.

For your information, will say that I made the trip from Mecca to Blythe recently in three hours and thirty minutes; the return trip was made in the same time.

This is good work, keep it up.

Yours very truly,

AUTOMOBILE CLUB OF SOUTHERN CALIFORNIA,
(Signed) E. E. East, Chief Engineer.

COOPERATION IN TREE PLANTING AND CARE IS COMMENDED

The commission has received the following letter from the Red Bluff Woman's Improvement Club:

RED BLUFF, CALIFORNIA, March 2, 1925.

California Highway Commission,
Sacramento, California.

GENTLEMEN: We thank you for the great assistance and service you have rendered the Red Bluff Woman's Improvement Club in enabling them to plant the avenue of trees between Red Bluff and Corning, and also thank you for taking such excellent care of them. Without your aid and help, it would have been impossible for the Committee to have planted the eighteen miles of trees.

The avenue is already attracting the eye of the public.

Most Cordially,

(Signed) MRS. M. ANDREW SCOFER,
MRS. J. F. ELLISON,
Chairmen, Tree Committee.

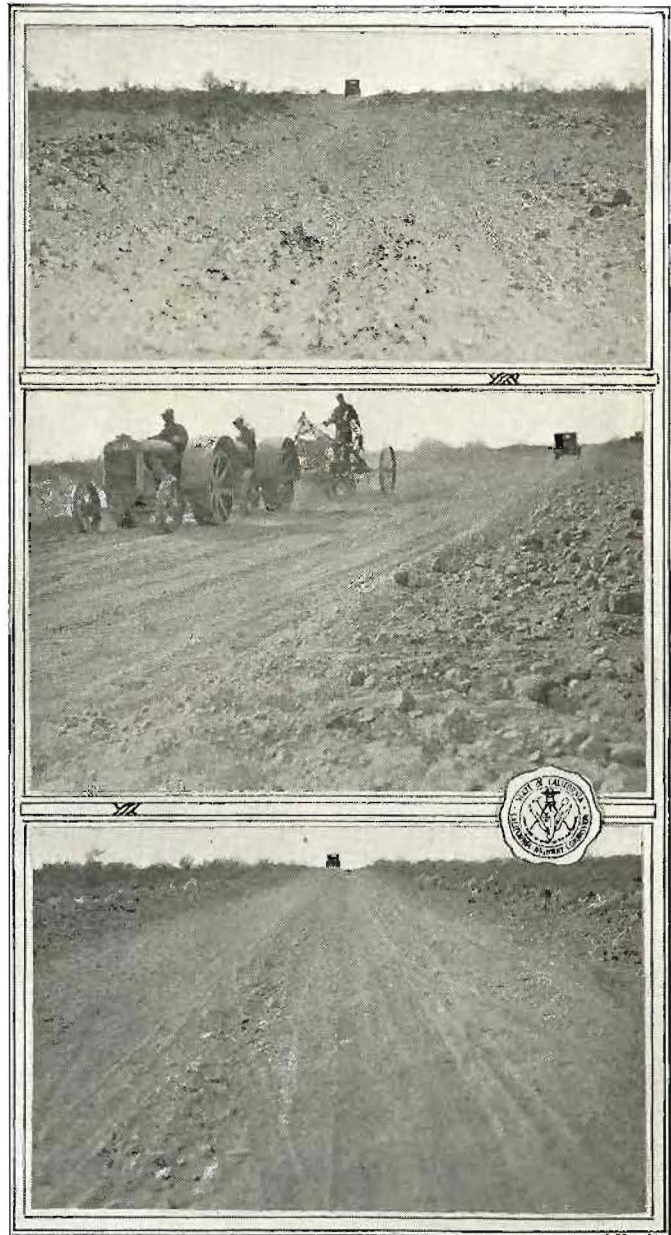
FROM THE LETTER OF A PRISONER

The following is quoted from the letter of a prisoner in one of the road camps, addressed to Superintendent Ben H. Milliken:

"With regard to the road camp, I can say that any man who could not make good here would be the type of a man who could not behave properly at his mother's funeral."

Herodotus tells of a road built 4000 B. C. It was in Egypt and reached halfway across the African continent. It required 10,000 men working ten years to build a single half mile of it. The stone for the Pyramids was hauled over this road.

In the ancient civilization of Peru streams were bridged and strong stone roads were built. Shade trees and sweet-scented herbs were set along the borders of the road, and at intervals, signs were erected for the direction of the traveler. Inns were built every twelve miles—a day's journey.



IMPROVING THE HIGHWAY ACROSS THE DESERT—Scenes on the National Old Trails Highway between Barstow and Needles, San Bernardino County, where Division VIII is doing extensive maintenance work. Above, the road as it was a year ago; center, state highway equipment in action; below, the road after a year's maintenance.

An Appreciation of Highway Building

From a statement by officials of the West Coast Transit Company, Inc., in connection with an application to the State Railroad Commission for permission to reduce motor stage fares between San Francisco, Eureka and Crescent City, via the Redwood highway.

A PPLICATION for general reduction in passenger fares, to become effective April 1st, is being filed with the State Railroad Commission by the West Coast Transit Company, Inc., operators of Redwood Highway Stages between San Francisco, Eureka and Crescent City.

The principal reason for this action is the *reduced cost of operating passenger motor coach equipment*, made possible by the thorough work of the *California Highway Commission* in generally improving the condition of the Redwood highway between San Francisco and the Oregon line.

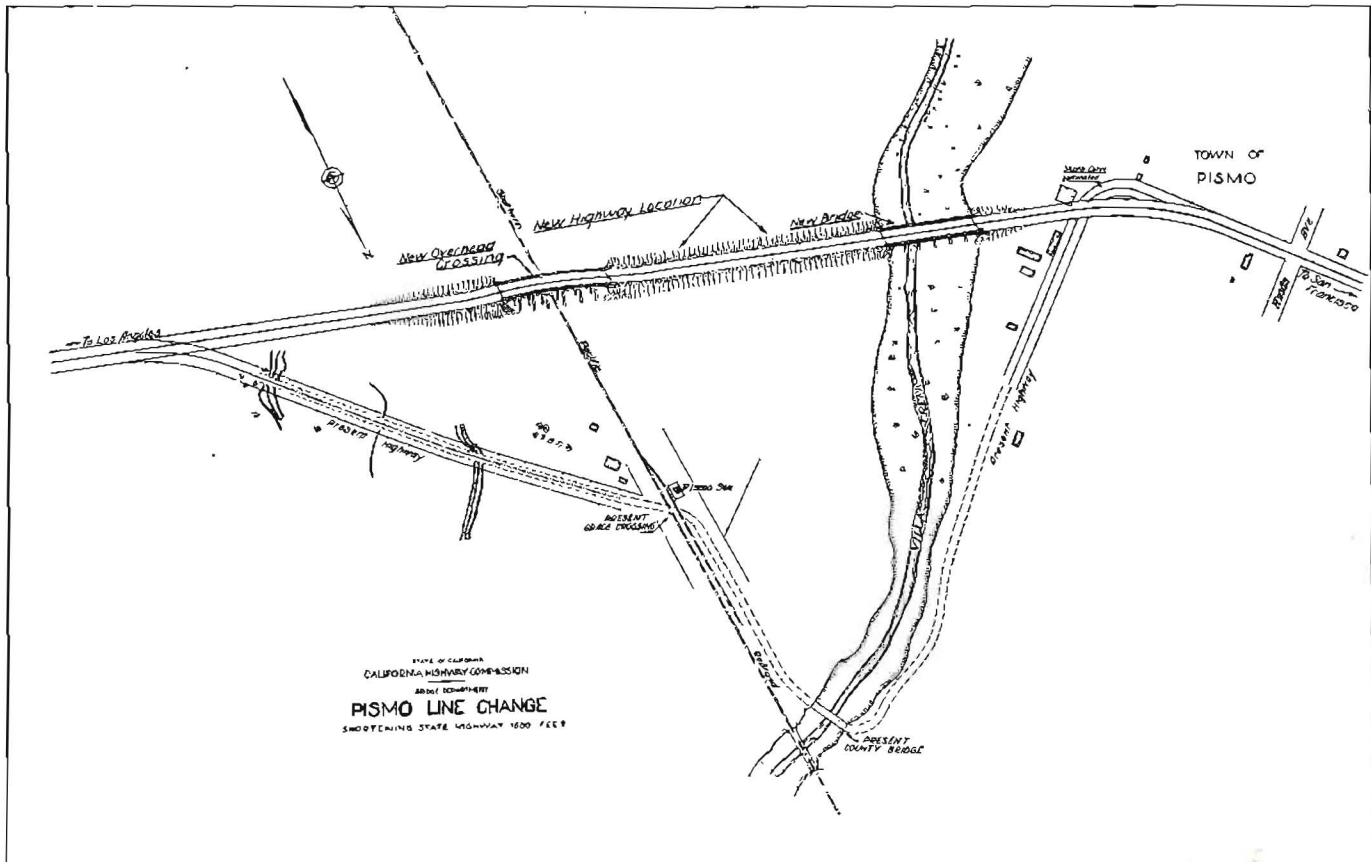
Similarly, improvements carried out by the several counties and the United States Forest Service, on the highways within their respective jurisdictions, has brought about a reduction in operating costs—particularly on the lateral routes of the system between Eureka, Red Bluff, Redding and Yreka.

The programs of these various bodies are rerouting portions of the highway, eliminating curves, widening and bettering the roadbed, *according to the company's cost sheets*, have proved important factors in reducing maintenance, depreciation, tire, fuel and other kindred operating expenses.

The new routing through the canyon above Willits, following the Eel river far over sixty miles almost to Eureka, winding in and out of the many groves of giant redwoods, opens up an attractive water level route which is constantly being improved by the Highway Commission. The new bridge across the Klamath River near Requa, now under construction, will save time and money in the operation of both through and local schedules.

This general reduction in operating cost the West Coast Transit Company proposes to pass along to the traveling public in the form of reduced one way and round trip fares.

THE PISMO LINE CHANGE—AN EXAMPLE OF MANY SIMILAR IMPROVEMENTS URGENTLY NEEDED ON THE STATE HIGHWAY SYSTEM



Drawing prepared by the bridge department showing plan adopted for the realignment and improvement of the state highway at Pismo Beach, on the Coast route, San Luis Obispo County. Sharp curves and a grade crossing will be eliminated. The work is planned for the coming summer.

WHAT THE DIVISIONS ARE DOING

MODERN PAVEMENT NOW CONNECTS CITIES OF EUREKA AND ARCATA

AFTER many delays due to continued and heavy rains during the period of construction, placing of a 20-foot concrete pavement along Humboldt Bay, between Eureka and Arcata, Humboldt County, in Division I, has been completed and will be open to traffic about April 1st.

The construction department reports remarkable results in the placing of this pavement. Laboratory tests show the compressive strength of the concrete probably in excess of any other pavement on the state highway system. Vialog tests will be made shortly and will show an exceptionally smooth riding surface.

J. F. Knapp of Turlock was the contractor on this project. The resident engineer was H. C. Ingle, who was assisted by E. D. Gardner.

The new automatic electric traffic gates have been installed on the Eureka Slough lift bridge. They will contribute greatly to the safety of the traveling public when the new pavement is opened to traffic.

Division I is much encouraged by the recent public statement of the West Coast Transit Company. The stage company is asking the State Railroad Commission for permission to reduce its passenger fares because of the lessened operating costs following improvement of the Redwood highway by the California Highway Commission.

With the exception of a short delay when the temporary bridge across the Van Duzen River was washed out during recent floods, there never has been a time when the Redwood highway was not open to traffic for at least a portion of each day. This is the record of Division I, despite 150 slides and a rainfall reaching 70 inches in some parts of the district.

RAIN AND SNOW KEEP MAINTENANCE FORCES BUSY IN DIVISION II

ALTHOUGH it can not claim a rainfall equal to that in the north coast counties, Division II has been having its troubles in recent weeks with both snow and slides. More snow removal work has been done in the division this winter than ever before. Between Mount Shasta City and Weed, drifts three feet in depth have been cleared by snow plows. Farther south, lesser drifts have been removed from the Pacific highway. Summits on the Alturas, Susanville, and Weaverville laterals have been cleared of snow.

At no time, however, has the Pacific highway been closed to traffic for more than a few hours at a time. Floods closed the road at Cottonwood and also at Corning for short periods but little damage was done to the highway at either point.

Numerous slides have occurred but the maintenance crews have managed to keep the highway open.

Widening Activities Resumed.

The Nevada Contracting Company, which has taken over, with the approval of the commission, the contract of Edwards Brothers for widening the third unit of the Sacramento canyon above Redding, is now at work and the road is closed to traffic from 6.30 p.m. to 10.30 a.m. daily. After May 15th, it will be closed but eight hours each day.

The Nevada Contracting Company and Dunn and Baker each finished their 1924 grading contract during March.

COMMISSION TAKES OVER SECTION OF COLFAX-GOLD RUN PROJECT

CONSTRUCTION of the Colfax-Gold Run section of the Nevada trunk line connection, Division III, has progressed to the point where the commission has relieved the contractor of the maintenance of 1.7 miles of the new grade. About four miles of the rough grading has been completed despite heavy rains which slowed down the work during recent months.

The Boca-Floriston grading contract, in the Truckee River canyon, is reported about 50 per cent complete with work progressing slowly due to weather conditions.

Division III has completed the placing of thirty miles of gravel

and crushed rock shoulders on highways, mostly in the valley sections.

Rains in many places in the Sacramento Valley are reported the heaviest since 1915. In several places pavements were flooded and maintenance crews assisted traffic by marking the pavements with stakes, towing cars and placing warnings.

Crushed rock is being stock piled at various places along the valley roads. A single crew is doing the work instead of the various maintenance crews, as this is believed a more economical arrangement. About 125 cars of crushed rock are being stock piled by a nine-man crew.

DIVISION IV REPORTS STORM DAMAGE TO NORTH BAY HIGHWAYS \$100,000

EXCESSIVE rain during February resulted in extensive damage to state highways in Division IV, particularly in Marin County. Division Engineer J. H. Skeggs estimates the cost of repairs will be \$100,000. Measurements taken at San Rafael show a precipitation in a period of fourteen hours of 6.77 inches. Sections of the highway were flooded in many places in Marin County and the Corte Madera grade had to be closed temporarily for the removal of slides.

The Freeman and Whiting contract, for widening a section of the Peninsula highway in the vicinity of Menlo Park, San Mateo County, has been completed and accepted by the commission. Traffic conditions, observation shows, have been greatly improved.

Grading work on the Skyline boulevard has been suspended for some weeks due to heavy rains during February which made impossible the operation of steam shovels and trucks.

D. A. Foley, contractor on the first unit of the Bay Shore highway, has established a camp at Belle Aire Island and is now at work with steam shovels borrowing material for the embankment fill. With more settled weather, much faster progress is expected on this project. On February 19th, a delegation of members of the legislature inspected the work under way.

Improvement Through Daly City.

An improvement of the state highway through Daly City is now under way. A local improvement district has been formed to place curbs and gutters along the route of the state highway, and the commission has arranged with Eaton and Smith, the contractors, to place a strip of concrete pavement seven inches thick at all places where the present pavement does not extend to the new curb line.

In all, 5955 lineal feet of pavement, about three feet in width, is being placed. When the work is completed, the state highway will have a uniform width of 50 feet from the south city limits of San Francisco to the southerly limits of Daly City, a distance of approximately one mile.

CONVICTS MAKING RAPID PROGRESS ON HIGHWAY UP KERN RIVER

COMPLETION of the state highway up Kern River Canyon to Democrat Springs by the end of 1925, is the prediction of Division Engineer J. B. Woodson of Division VI. The project is now 50 per cent completed, including the placing of six-inch decomposed granite surfacing. The work is being done by prisoners from Folsom prison.

Division VI has had its first 1925 reconstruction contract awarded. H. H. Peterson of San Diego will place 5.3 miles of second story concrete and 1.1 miles of flush concrete shoulders on the valley trunk line in Merced County.

Fordson tractors were provided by the division during the recent highway water to assist traffic in getting through Berenda and Ash sloughs on the Pacheco Pass lateral, Madera County. As funds for bridges are not available, fords have been constructed for crossing these streams. For a time they were under several feet of water.

NEWS FROM DIVISION VII

HAVING completed the waterproofing of the Santa Margarita River bridge, the maintenance forces of Division VII are now engaged in similar work on the San Luis Rey bridge at Oceanside on the Los Angeles-San Diego coast route.

DIVISION ACTIVITIES

Maintenance crews have completed the paving of approaches to the Santa Inez Creek bridge on the Coast boulevard, north of Santa Monica, and the new structure is now open to traffic.

1925 RECONSTRUCTION PROGRAM GETTING UNDER WAY IN DIVISION X

THE Kaiser Paving Company of Oakland has been awarded the contract for widening the state highway in Division X, between Putah Creek and Woodland and between Woodland Y and Davis. Something over twelve miles of flush concrete shoulders will be placed.

Bids have been received and are pending award for the placing of 11.6 miles of new twenty-foot concrete pavement between the Stanislaus River and Turner station, in San Joaquin County. This will be the most important reconstruction project of the year in Division X.

R. N. Murdoch is making excellent progress on his grading contract between Jackson and Pine Grove on the Alpine highway, in Amador County.

Little damage was done in Division X by recent rains. An approach to a bridge in Amador County was partly washed out and traffic was held up for a time by high water just north of Stockton.

Maintenance Activities.

Two large culverts have been authorized for the Big Oak Flat road between Chinese Camp and Jacksonville.

Daylighting of a number of dangerous turns on the Sonora and Jackson laterals will be started in the near future.

Surfacing work will be done this spring on sections of the Alpine lateral between Pine Grove and Pioneer Station.

BRIDGE DEPARTMENT NEWS

THE bridge department is elated with the preliminary report of laboratory tests on concrete going into the Rincon seawall in Ventura County. After many delays, actual placing of concrete has been begun with the expectation that the work will be rushed from now on if a satisfactory water supply holds out.

The new reinforced concrete arch bridge across the Van Duzen River, Humboldt County, has been completed and opened to traffic. This magnificent structure, 734 feet long, was designed by the bridge department and built under its direction. Humboldt County cooperated the state in financing the project.

The new Sycamore Creek bridge, north of Oceanside, San Diego County, a reconstruction project, has been completed and will be opened to traffic in the near future.

The contract of Leventon and Heintze, for grading work between Denverton and Suisun, has been extended to include the construction of a small reinforced concrete bridge over Denverton Slough, forty-five feet in length.

Storm Causes Bridge Collapse.

A county-built concrete girder bridge across Willow Brook, on the Redwood highway, Sonoma County, Division IV, was extensively damaged during recent floods. The bed of the stream scoured out from under the center pier causing it to settle vertically a distance of six feet. Traffic is being detoured around the bridge at the present time.

The two small concrete bridges under construction over the central irrigation canal, in Glenn County, are scheduled for completion by the time this is in print. Otto Parlier is the contractor.

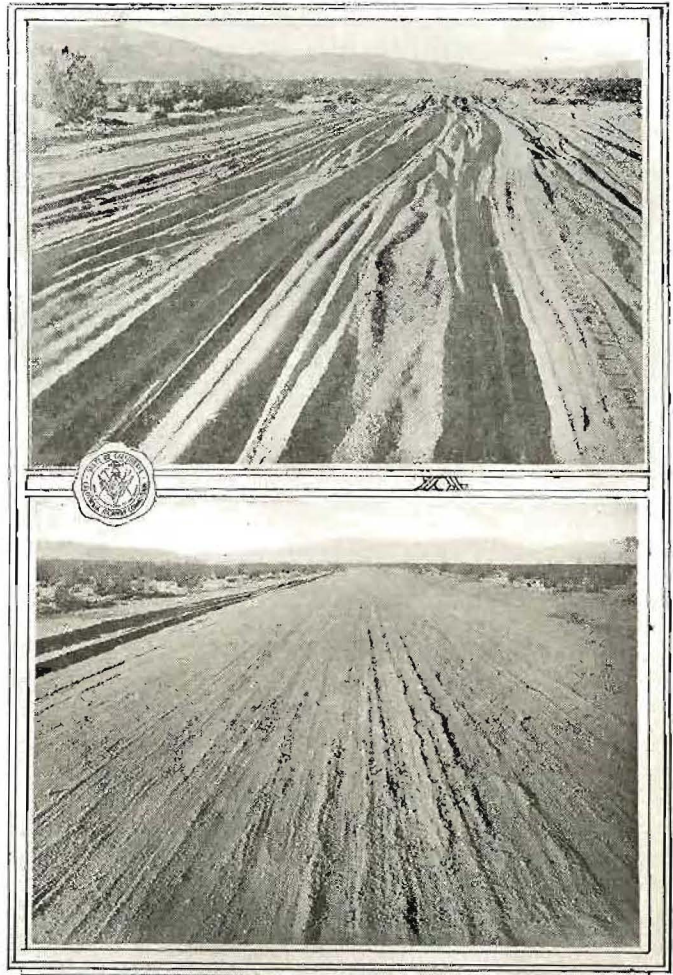
A timber bridge over Willow Creek, Glenn County, on the Willows-Oroville lateral, was washed from its supports during the recent floods. The bridge was a county-built structure and the commission and the county are considering a cooperative project for its replacement.

Very Simple.

Little Girl (to grandfather): "Grandpa, why don't you grow hair on your head?"

Grandpa: "Well, why doesn't grass grow on a busy street?"

Little Girl: "Oh, I see; it can't get up through the concrete."—Ex.



ON THE ROAD TO OWENS VALLEY—Views showing accomplishments between Mojave and Independence, Division IX. Above, the county road taken over by the commission last January for maintenance. Below, results of work by state forces. This work is provided for in the commission's 1925 maintenance budget.

BIDS ASKED ON TWO LARGE BRIDGE PROJECTS

TWO IMPORTANT reconstruction projects of the year 1925 will be the replacement of the Mossdale bridge across the San Joaquin River, in San Joaquin County, and the building of a new bridge across the San Gabriel River on the Whittier boulevard, Los Angeles County.

Bids have been received and are pending award on the San Joaquin bridge. It will be of the bascule lift span type of steel and concrete, 532 feet long. The present bridge, built by the county, has long been inadequate for traffic and has been condemned by the War Department.

The new San Gabriel bridge will take the place of a narrow and dangerous wooden structure. The new bridge will be of reinforced concrete with a clear roadway width of forty feet, and, in addition, six-foot sidewalks for pedestrians on either side.

Both projects will be financed with gasoline tax funds.

Remains of the first recorded roads are still in existence. They were built by the Assyrian Empire about 1900 B. C., and like the spokes in a wheel, radiated from Babylon to the corners of the empire.

CALIFORNIA HIGHWAYS

OFFICIAL PUBLICATION OF THE
CALIFORNIA HIGHWAY COMMISSION
SACRAMENTO, CALIFORNIA

HARVEY M. TOY, Chairman;
N. T. EDWARDS and LOUIS EVERDING, Commissioners.

ROBERT M. MORTON, State Highway Engineer.

W. F. MIXON, Secretary.

We are pleased to permit publication of any of the matter contained herein or to loan cuts and this privilege is extended newspapers and periodicals without restrictions.

FRANK B. DURKEE Editor
P. O. Box 1103, Sacramento, California.

Vol. 2 MARCH, 1925 No. 3

JUST AMONG OURSELVES



HIGHWAY NEWS NOTES

Maintenance Superintendent Resigns.

CARL MILLER has resigned as maintenance superintendent in Humboldt and Del Norte counties, Division I, and has accepted a position as construction superintendent with the Englehart Paving Company. He has been succeeded by W. W. Compton.

J. J. Stockard, Division I maintenance engineer, has been moved from Willits to Eureka which will be his future headquarters. Major maintenance operations necessary in the northern part of the division necessitated the change.

News From Division II.

Division II recently was favored with a visit from F. R. Seymour, formerly clerk in this division, and now Assistant Superintendent of Prison Road Camps. Come again, Fred, always glad to see you.

C. F. Woodin, chief draftsman for the past five years, has resigned to enter business in Los Angeles. Eli Dallas succeeds Mr. Woodin as chief draftsman.

E. N. Babb, chief clerk, has returned from a business trip to Oakland.

L. R. Redden, F. S. Wilson, E. L. Seitz, and J. G. Standley are among those enjoying mid-winter vacations.

Miss Josie Paul, clerk, has returned from a vacation trip to Sacramento.

Engineer Weds Auburn Girl.

H. B. LAFORGE, assistant resident engineer, Division III, has been handed a new assignment. He became assistant to Miss Marjorie Slade of Auburn, to whom he was married on February 21st. It was a double wedding, the sister of Miss Slade being wedded at the same time.

G. W. Wade, assistant maintenance engineer, recently resigned to go into business for himself. The division wishes him every success.

W. F. Remington, assistant resident engineer, has been transferred from Division III to the bridge department at headquarters.

Due to curtailment of work, H. F. Falsz, instrumentman, has been laid off.

Now He is Up in the Air.

SOONER or later they all fall. A. N. George, the aviator-engineer of Division VII, took his turn a few days ago when he was married to Josephine K. Hirschler, of South Pasadena.

The groom's best man was E. S. Gripper, a former employee of the commission.

"The church and home were profusely decorated with pale pink carnations and ferns. There were also baskets of flowers. The bride's gifts ranged from a building lot, the gift of her father, to most everything the heart could wish."

Mr. George had charge of the recent rebuilding of the highway between Oceanside and San Diego, and is now supervising the preparation of plans and specifications for the proposed reconstruction of Whittier boulevard between Montebello and Whittier.

C. P. Montgomery, resident engineer, has been assigned to the Jewett Contract, for the construction of the Coast highway through the Malibu Ranch in Los Angeles County. He recently had charge of the construction of the coast highway in Orange County between Huntington Beach and Corona Del Mar.

Snake Bite Sends Foreman to Hospital.

Maintenance Foreman V. S. Ver Bryck, of Division VIII, recently was forced to spend a week in the hospital as the result of a snake bite on the hand received while clearing away brush caught in the blade of a road grader. He suffered intense pain while being rushed to the hospital, but now seems fully recovered.

Governor Friend W. Richardson, in company with Commissioner Nelson T. Edwards and State Highway Engineer R. M. Morton, recently inspected a number of the state highways in Division VIII.

No Superstition Here.

Friday, the thirteenth day of February, brought happiness to the home of Fred R. Holm of Division X. On that date, Mary Ellen Holm arrived and daddy reports mother and daughter doing well.

Miss Lorene Gibson, typist, spent the Washington birthday holidays in the Bay cities.

H. O. Ragan and Jesse W. Cole, resident engineer and assistant resident engineer, respectively, on Contract M-44, Solano County, are leaving the employ of Division X at the end of this month.

Division X is not without its Radio fans—the last victim of Radioitis being none other than Clifford J. Temby, formerly of headquarters.

A Cure for Spring Fever.

FRED GRUMM advises all who have an over-abundance of the annual "spring fever" to join the baseball team being organized by R. A. Watkins, who looks after equipment for Division X. An outfit representing headquarters and Divisions III and X is suggested to combat a team from the shops and the laboratory.

T. E. Stanton announces that headquarters challenges any of the divisions or other state departments to either golf or tennis.

M. J. Small of the headquarters shop has been endeavoring to get some interest started in the good old Scotch game. He wants an elimination contest among the highway bunch for the selection of a team to meet other state departments and to take part in the annual city golf tournament.

New Draftsman Turns Out to be a Girl.

Charles U. Fonteneau, headquarters draftsman, passed the cigars on Tuesday, February 24th, in honor of the arrival in his home of Edith Marie, a husky daughter. Mother and child are reported doing well.

News From Woodson.

P. L. Wilcox has been appointed resident engineer in charge of the reconstruction contract in Merced County.

Philip Boulton and Leslie Tresidder have been reappointed rodmen on the Briceburg-El Portal convict project.

George L. King, Delano maintenance foreman, is breaking in a subforeman, born February 20th.

Hard Boiled.

The black-haired waitress, very much out of sorts, sailed haughtily up to the table at which sat the grouchy customer. She slammed down the cutlery, snatched a napkin from a pile and tossed it in front of him.

Then striking a furious pose—

"Whatcha want?" she snapped.

"Coupla eggs," growled the diner.

"How ya want 'em?"

"Just like you are."

A Parking Episode.

Nuf—"Yes, we had the loveliest time; Jack's car is a wonder. We passed everything on the road."

Sed—"Well, we had a lovely time, too; everything passed us."



A LOS ANGELES COUNTY FIND—Stone and bone implements and stone mortars showing remarkably fine workmanship recently were unearthed by a state highway crew on the Coast boulevard, Los Angeles County, while excavating for the approaches to the new Santa Ynez Canyon bridge. The discovery was made a few miles north of Santa Monica.

INTERESTING RELICS UNEARTHED BY MAINTENANCE CREW

STONE mortars of wonderful workmanship, knives, ceremonial wands, war clubs, arrow heads and bone fragments, probably of prehistoric Indian tribesmen, were among the things unearthed recently on the Los Angeles County coast, north of Santa Monica, by a maintenance crew of the California Highway Commission working under the direction of Foreman H. E. Garris.

The interesting discovery was made while material was being excavated for the construction of the earth approaches to the new Santa Ynez Canyon bridge. Most of the articles were found from a foot to three feet under the surface.

The stone mortars were of various sizes and shapes and were made from trap rock boulders, carefully dressed both inside and out. One of those recovered weighed over one hundred pounds. A stone dagger, several excellently formed

pestles, a plate, ball sinkers, also were included in the find. Most unique of all, were five oddly carved hooks made from a very hard blue stone and evidently used in weaving.

Home of Ancient People.

Fragments of skeletons also were in the mound, apparently the bones of former residents of the region. Adjacent to the burial mound, the soil contains many fragments of shells and is nearly black. Here was the fireside of these ancient people, who presumably lived on shellfish and the grain which they ground up in their heavy mortars.

Santa Ynez Canyon undoubtedly is the site of one of numerous villages, located along the ocean front northerly from Santa Monica, in which lived an ancient race of people.

The collection of relics was turned over to the Los Angeles Historical and Art Museum at Exposition Park, Los Angeles, where it is now on exhibition.

GIBSON'S LAMENT

My FORD is my auto: I shall not want another.
It maketh me to lie down beneath it, it soureth my soul;
It leadeth me in the paths of ridicule, for its name's sake.
Yea, though I ride through the valleys; I am towed up
the hills;
I fear no more evil; thy gears and thy engine sufficiently
discomfort me.
I anoint thee with patches; my tank runneth over.
I prepare me for blowouts in the presence of mine enemies.
Surely if this thing follows me all the days of my life,
I shall dwell in the bug-house forever.

—Anon.

Editor's Note: The oldtimers in the department will appreciate the above which was written during the early days of state highway construction and refers to Division Engineer L. H. Gibson and his famous Ford. Gibson was then a traveling inspector. The contribution was sent in by Division Engineer T. A. Bedford, who found it in some old files at Willits.

The Radio Bug.

Oh, Ryon, poor Ryon, the radio bug,
He'll be listening in while his grave's being dug.
He monkeys with static and meters and volts,
And he twists little handles and doo-jigger bolts.
He climbs on the table and falls off the roof,
And he thinks the nonradio guy is a goof.
He'll sit up at night with his bakelit box,
'Till the cuckoos have cuckooed to death in their clocks.
He tunes in on Tampa and then he gets Maine,
And sprains his neck when he thinks he gets Spain.
His wife is a widow, his dog is forlorn,
His mind's in the ether where wave-lengths were born.
He cuts in condensers, reverses his field,
And he throws a fit when his loud-speaker squealed.
He goes to the kitchen to grab a light lunch,
Then back to his head phones to listen and munch.
I tell you its AWFUL—it goes in degrees,
But he sure does swear by that radio disease.
—L. R. Smith (with apologies to Smith-O-Grams).

You're Out.

Sam—"Don't yo' go foolin' wid me, boy. Does yo' know who Ah is?"
Rufe—"No. Who am yo'?"
Sam—"Ah's de Count Ten, dass who!"—*American Legion Weekly.*



The map above does not show all of the state highways in California but only those included in the federal aid system, representing approximately 7 per cent of the total road mileage of the state, outside of cities.

CALIFORNIA STATE PRINTING OFFICE
JOHN E. KING, State Printer
SACRAMENTO, 1925