

CALIFORNIA HIGHWAYS

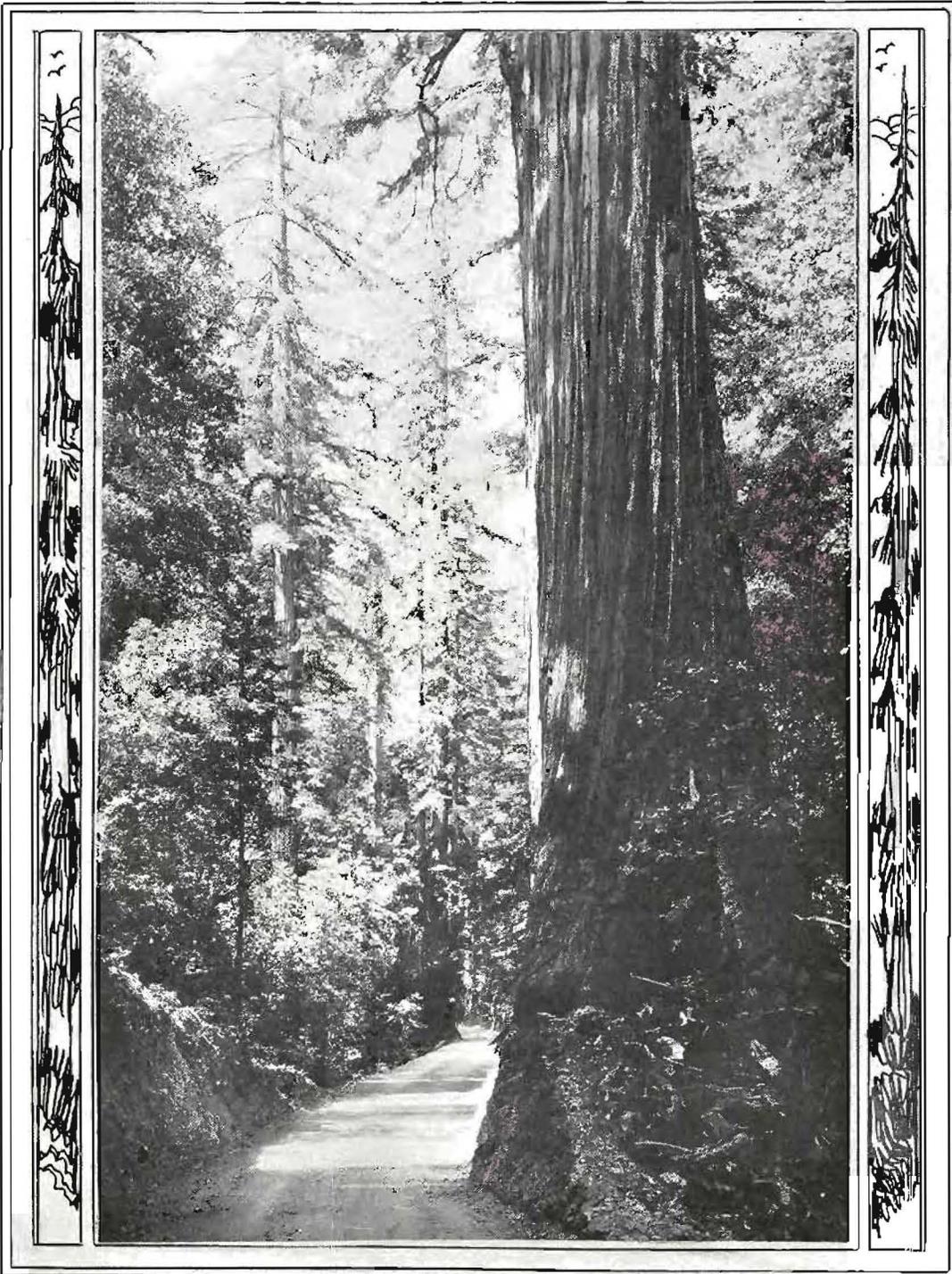
CALIFORNIA
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A BULLETIN ISSUED BY THE CALIFORNIA HIGHWAY COMMISSION FOR THE
INFORMATION OF ITS EMPLOYEES AND THE PUBLIC

Vol. 4

MAY, 1927

No. 5



THE MARCH OF PROGRESS—A giant of the Redwood highway section where a number of important contracts for state road work will be in progress this season.

CALIFORNIA HIGHWAYS

BUILDING SAFETY INTO CALIFORNIA MOTOR ROADS

This Bulletin is published by the California Highway Commission for the information of its employees and the public. Editors of newspapers and others interested are welcome to use, without restriction, any of the matter herein contained. Cuts will be gladly loaned upon request.

J. P. HALL Editor
P. O. Box 1103, Sacramento, California.

Vol. 4. MAY, 1927. No. 5

CALIFORNIA HIGHWAY DEPARTMENT

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Sacramento, California.

EVERY employee of the highway commission has a direct interest in the improvement of the highway organization's methods and results, both engineering and clerical, office and field. To that end, the State Highway Engineer invites constructive criticism or suggestions from every employee. Ideas as to the more economical and efficient handling of your job, or suggestions for elimination of waste will be welcomed. Criticism is also desired from persons outside the organization, who are in a position to give facts. Send only signed communications addressed as follows: California Highways, P. O. Box 1103, Sacramento, Cal.

CALIFORNIA HIGHWAY engineers are recognizing as never before the fact that building for safety is one of the greatest responsibilities resting upon them in developing the road program of the state. They are making every effort to build safety into the road rather than depend upon warning signs and devices alone to protect the motorists.

Relocating the main roads to eliminate curves, to avoid railroad grade crossings and to reduce steep grades is now a large part of our engineers' work. Incidentally, these relocations save distance, avoid costly bridges and mean benefit to the motorist in the cost of vehicle operation.

The frequency of highway accidents resulting from traffic congestion has demonstrated not only that we must construct our new highways of ample width, but also that we need to widen many of the roads and bridges now in use. This has led to the construction in the vicinity of large industrial centers and on main thoroughfares of what is known as the "super-highway" to insure the maximum road capacity, speed and safety.

Our highway engineers are bringing science to bear upon the solution of the problems of highway safety. Today, but a very small percentage of accidents on our main roads can be attributed directly to engineering defects. No public work is of greater importance than that of widening and extending our present roads, as well as paving new ones, to meet our constantly increasing need for adequate highway facilities.

COMMENT.

In commenting on the personnel of the State Highway Commission the Chico Enterprise says: "The members of the State Highway Commission coming, as they do, from Humboldt, Fresno and Orange counties are geographically as well as personally ideal."

We pay for good roads whether we have them or not, but we pay more when we do not have them. A road, after it is improved, pays for itself many times over.

The policy of the California Highway Commission to secure adequate width for all state roads will save the state a great deal of money and future legal troubles. In the city of Pittsburgh, Pa., it recently cost \$1,620,000 to widen a short section of street to 80 feet.

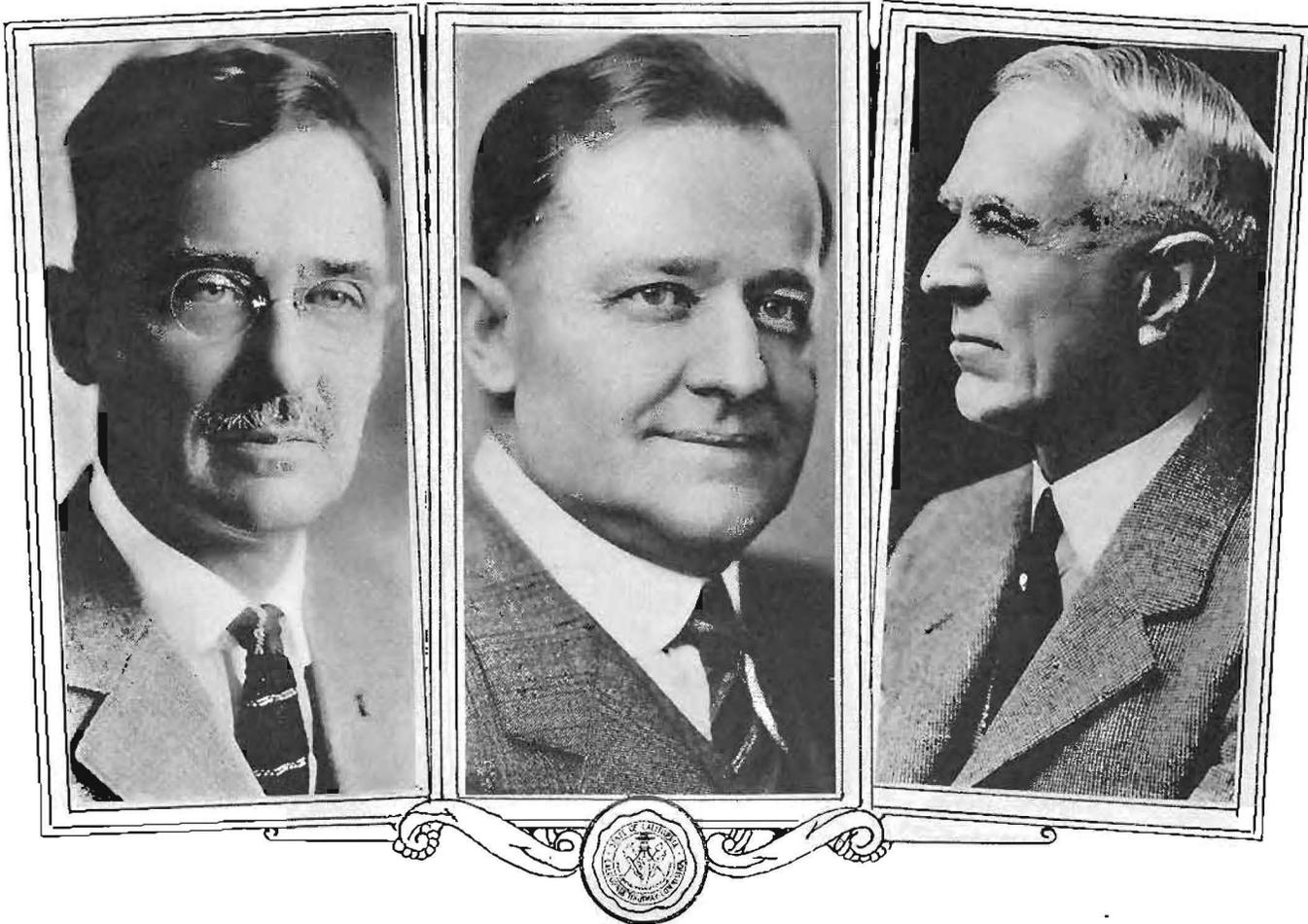
It pays to meet traffic demands. At least Chicago thought so when she spent \$8,250,000 for Wacker Drive, an elevated street.

The Missouri state highway commission is instituting the new methods of opening bids "in public," that is, by having their proceedings broadcasted by radio. This is further evidence that "show me" originated in Missouri.

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Commission Confronted With Many Big Problems



CALIFORNIA HIGHWAY COMMISSIONERS—*Left*, Senator M. B. Harris, of Fresno, Fresno County; *Center*, Ralph W. Bull, of Eureka, Humboldt County, Chairman; *Right*, J. P. Baumgartner, of Santa Ana, Orange County.

DURING THE next decade the work confronting the California State Highway Commission is of stupendous proportions. Surveys made by the Commission bear out the reasonableness of the multitude of requests which, with many other factors, mark the immediate future as one brim full of problems for the state's road builders.

During the past few years lack of funds for new construction has slowed up the expansion of the system to almost a standstill. Progress was so far hampered as to last year put all other states but one ahead of California in new construction. In the meantime the state continued to develop, her need for new state roads multiplied and the Commission is now called upon by many localities to build the roads they expected some years ago.

The increase in auto traffic, and especially heavy truck traffic, presents another serious problem. It has been far greater than highway expansion and now the Commission must spread available funds in such manner as to relieve traffic congestion in many parts of the state and yet build highways of proper standards. A concrete example of such a condition was noted at Los Angeles on Sunday, May 1st. Many city autoists who went out for a short ride on the state

highway through Saugus and Newhall could not get back to their homes until the next day, although they were but a few miles out of the city. A total of 25,000 cars passed through the Newhall Tunnel, which is but 16 feet wide; and those who did not get through waited till Monday morning. This route is now the only entrance to Los Angeles from the San Joaquin Valley. San Francisco, too, is confronted with a similar problem in handling her peninsular traffic and while steps must be taken to give relief, much care must be used in authorizing the expenditures.

While the cities are wrestling with their traffic problems and asking state aid the back country is calling for certain of their designated state highways to be built and maintained. They rightfully contend that if the state is to be developed it must be traversed with proper highways. Motorists who are paying for highways with their gas tax demand access into new pleasure grounds. Many towns and cities want rerouting to be relieved of traffic while many more want to get into the traffic. Bridges, which before heavy trucking came into vogue were adequate, are now a menace when subjected to full legal loads.

Surely the problems of the highway commission are many, varied and difficult.

NEARLY \$3,000,000 STATE ROAD WORK AUTHORIZED

THE RECENT ruling by Attorney General U. S. Webb that the State Highway Commission need not wait the next biennium, before awarding contracts to be paid for out of the revenues of that period opened the way for the Commission to get much of this year's work under way in time for completion before winter.

About \$3,000,000 in reconstruction was authorized at the last two meetings of the Commission. Plans, specifications and bids were directed on the following projects:

SAN JOAQUIN COUNTY (Route 4)—Bridge across Stockton diverting canal, on the proposed new entrance to Stockton from the north. Reconstruction of 2.4 miles between Stockton and Cherokee Station.

GLENN COUNTY (Route 7)—Bridge across Wilson Creek.

CONTRA COSTA COUNTY (Route 14)—Bridge across Wildcat Creek.

SAN MATEO COUNTY (Route 2)—Paving between Colma and Cypress Lawn cemetery, for distance of 1.6 miles. San Francisco, San Mateo County, the Market Street Railway and the state cooperating on this project.

SHASTA COUNTY (Route 3)—Reconstruction of 8.8 miles between La Moine and Mears Creek.

SAN DIEGO COUNTY (Route 2)—Reconstruction at Del Mar overhead crossing approaches, 0.87 miles.

MONTEREY COUNTY (Route 2)—Reconstruction of 1.86 miles between Salinas and Santa Rita highway.

EL DORADO AND PLACER COUNTIES (Route 38)—Rock surfacing between Meeks Bay and Tahoe City, 11.2 miles.

PLUMAS COUNTY (Route 29)—Grading construction from easterly end of Lake Almanor causeway to Chester Grade, 0.86 miles.

ORANGE COUNTY (Route 2)—Reconstruction of 5.68 miles from Irvine Crossing to one mile north of Galivan. (Route 60)—Construction of creosoted pile trestle bridge and bulk heads over westerly channel of San Juan Creek.

SAN LUIS OBISPO COUNTY (Route 2)—Reconstruction of grade and surfacing 0.18 miles, 1.9 miles north of San Luis Obispo.

(Route 2)—Reconstruction of 10.73 miles between Pismo and San Luis Obispo.

SANTA BARBARA COUNTY (Route 2)—Grading and surfacing 0.31 miles.

KERN COUNTY (Route 4)—Reconstruction of 18.48 miles between Leido and Delano.

LOS ANGELES COUNTY (Route 61)—Retaining walls on Arroyo Seco Road.

HUMBOLDT COUNTY (Route 1)—Bridge across Redwood Creek near Orick. (County donation.)

MODOC COUNTY (Route 28)—Bridge across Rattlesnake Creek. (County donation.)

COLUSA COUNTY (Route 7)—Bridges at Stone Corral and Funk Slough.

SACRAMENTO AND PLACER COUNTIES (Route 3)—Reconstruction of 3.08 miles, Sylvan School to Roseville.

ALAMEDA AND SANTA CLARA COUNTIES (Route 5)—Reconstruction of 4.45 miles, Warm Springs to Milpitas.

ALAMEDA COUNTY (Route 5)—Reconstruction of 7.8 miles, Dublin to Hayward.

IMPORTANT CONTRACT AWARDED FOR REDWOOD HIGHWAY UNIT

THE AWARDING of the contract for the grading and surfacing of 14.9 miles of the Redwood highway from Orick to the northerly boundary line of Humboldt County will be good news to all interested in the improvement of the state highway system up in the redwoods. In addition to this contract, which went to W. H. Hauser of Oakland for \$439,809, against an engineer's estimate of \$464,104, the clearing of the right of way was made a separate contract, the Englehart Paving and Construction Company now doing the work. A bridge across Redwood Creek, to be built by Humboldt County, is also included in the project.

The Hauser bid was made with a time limit on the job placed at 350 working days, but following the receipt by the Highway Commission of many requests from civic organizations along the Redwood highway from Marin to Del Norte counties, Mr. Hauser agreed to a cut in the time to 175 days which will assure the completion of the unit this season.

CONSTRUCTION DEPARTMENT, TAKE NOTICE.

The oldest pavement in the United States laid at Bellefontaine, Ohio, in 1894, recently underwent crushing tests which showed an average strength of 5400 pounds per square inch.

'Twas Ever Thus.

When the plumber makes a mistake he charges twice for it. When a lawyer makes a mistake it is just what he wanted, because he has a chance to try the case all over again.

When a carpenter makes a mistake it's just what he expected.

When a doctor makes a mistake he buries it.

When a judge makes a mistake it becomes the law of the land.

When a preacher makes a mistake nobody knows the difference.

But when an editor makes a mistake—Good Night!—Keystone Topics.

RINDGE RANCH CONFERENCE

ONE OF the important results that evolved from this month's meeting of the California Highway Commission at Los Angeles was the creation of a better feeling between the state and the stockholders of the Rindge Estate Company regarding matters connected with that section of the Oxnard-Capistrano highway between Los Angeles and Oxnard, now being built through this famous ranch which skirts the Pacific for a distance of twenty miles.

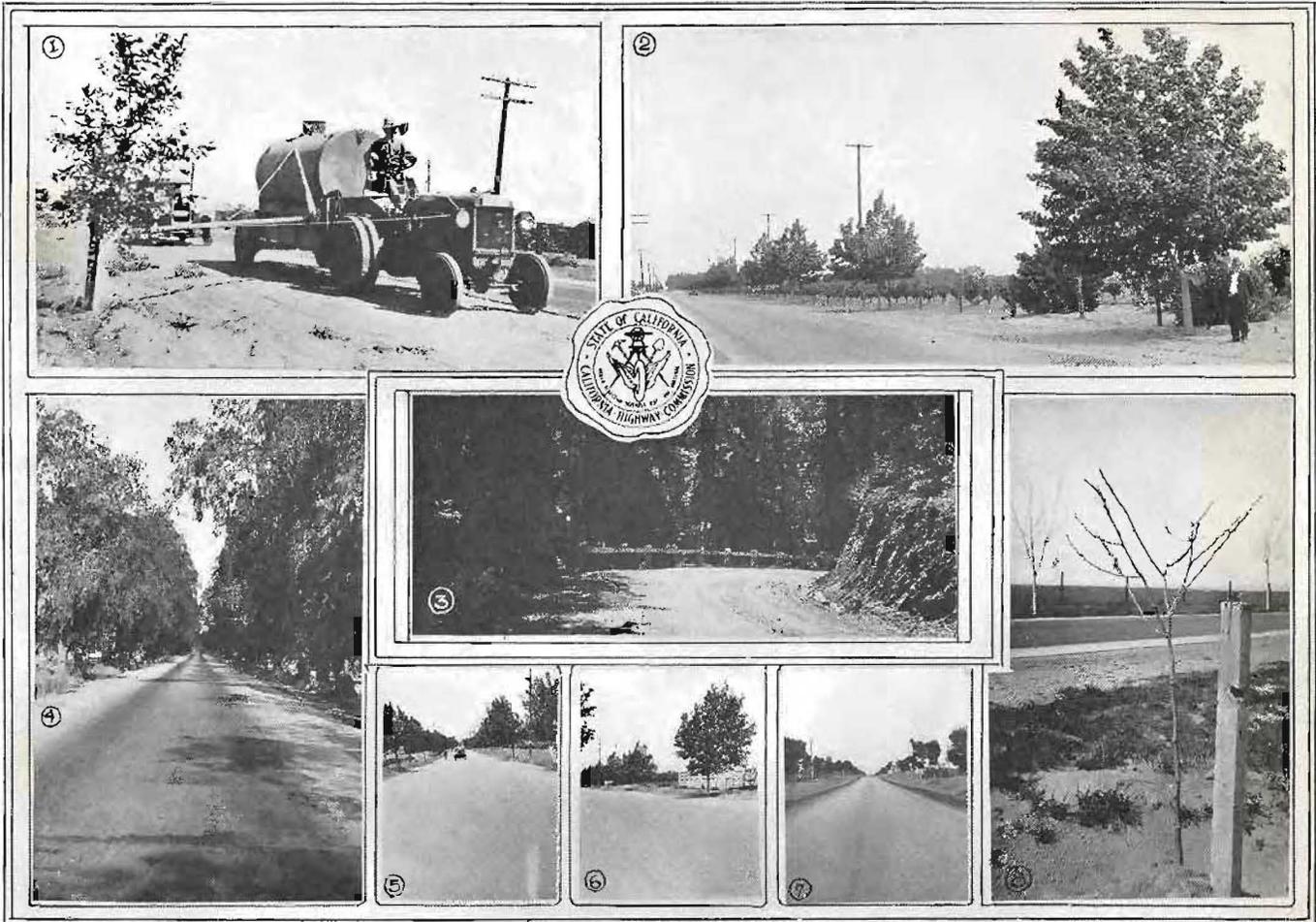
For several years past the state has been at work on this section which will give another much needed entrance to Los Angeles from the north. However, due to unsettled matters regarding rights of way, details of location and the use of water and construction materials found on the property, much misunderstanding arose previous to and following court actions, with no indications of a settlement agreeable to all concerned.

At request of prominent Los Angeles citizens representatives of the Rindge Corporation came to Sacramento to arrange the conference, which took place on the 12th instant on the Rindge Estate. All stockholders of the company, the Commission and secretary, and the State Highway Engineer were present, participating in a friendly and open discussion of all points at issue and viewing the uncompleted 14 miles of highway within the boundaries of the ranch. Following a complete discussion of the heretofore disputed points it was agreed that the Rindge interests are to immediately formulate their desires on the matter in writing and file same with the Commission for its prompt decision.

All who attended the conference expressed the hope that a complete agreement will be reached upon the points at issue, so that this new road, which means so much not only to the state but also to the Rindge interest, will see an early completion.

The California Contractor recently gave space to a story on the new division headquarters at San Bernardino, stating that the new buildings are a credit to the entire state.

SHADE TREES FOR CALIFORNIA STATE HIGHWAYS



SHADE TREE SCENES ON CALIFORNIA STATE HIGHWAYS—(1) Tank truck for irrigating trees in operation in Division VI. (2) European Sycamores planted in February, 1923, by the Turlock business men. They have been under the care of Maintenance Foreman L. P. Laird and show an excellent growth. (3) Forest scene on Redwood highway, Division I, where Mother Nature has provided the trees. (4) Highway trees in Riverside County, Division VIII. (5) and (6) Young Sycamore trees between Lodi and Mokelumne River, San Joaquin County, Division III. (7) Four-year-old black locust in Merced County planted by Delhi, Turlock and Livingston. (8) A newly planted sapling ready to begin the life in Kern County, Division VI. Note the shapely pruning.

Reported by W. E. GLENDENNING, State Highway Arboriculturist.

SYSTEMATIC tree planting for road beautification began in 1920. By 1922, 100 miles had been planted. At the present time, the Highway Commission is maintaining 56,400 trees on the state highways covering a lineal distance of approximately 685 miles. Generally the trees are spaced at 50-foot intervals, being placed alternately on the right and left sides of the roadway with the necessary elimination for visibility at crossings and road intersections.

These plantings are distributed among the several highway divisions as follows:

Division	Headquarters	Trees	Miles
Division I	Willits	1,230	6
Division II	Redding	1,451	17.5
Division III	Sacramento	9,151	88.45
Division IV	San Francisco	10,768	242.30
Division V	San Luis Obispo	280	2.50
Division VI	Fresno	7,835	54.65
Division VII	Los Angeles	3,742	51.40
Division VIII	San Bernardino	12,937	142.30

Division	No trees planted	
Division IX Bishop	9,011	79.90
Division X Sacramento		
Total	56,405	685

In addition to the above, a careful estimate of former planted and natural trees within the highway right of way gives a number far in excess of those listed, the care of which involves a project of considerable magnitude. This is usually assigned to the individual foreman. Assisting in the direction of this work is an arboriculturist reporting to the maintenance engineer. Special tree-watering equipment with movable discharge pipe has been developed which enables the watering to be performed from the driver's seat, a tank truck of 1200 gallons usually being sufficient to water from thirty to forty trees. Aside from irrigation and cultivation, many precautions are necessary for the protection of young trees against insect pests, damage by squirrels, gophers, moles and loose stock driven along the highway. The hazard of fire is also great.

Romance of Transportation in California

PART II.

By F. W. HASELWOOD, Division Engineer, Division III.

Note.—The first installment of this most interesting history appeared in the April issue.

AS RIVER navigation was monopolized, so the California Stage Company and the Pioneer Stage Line absorbed the land transportation. This was not the case, however, with freighting. Mule teams, and many of them with no organized control, crowded the streets of the growing mining towns and after supplying their wants, passed on to more scattered communities. A string of jingling bells, arched over the leaders' collars, gave notice of their approach.



F. W. HASELWOOD.

This freight system needed roads, many of which were kept in excellent condition being toll roads. Well-graded roads also accommodated six-horse teams attached to twenty-four-passenger stage coaches, although at places they were narrow enough to give the patrons a thrill. On level or down-grade road the animals went at break-neck pace, with the skilled driver cracking his long lash close to their ears. No stage coaching ever surpassed that of those early days in California.

Postal service in these days was another problem. The first gold seekers waited six months to a year for a letter from home. Uncle Sam was slow at first to improve the service but upon our admission to the Union a mail route, San Francisco to Fort Bridges, via Salt Lake, was established. A. Woodward and George Chorpeneing had the first mail contract in 1851 for \$14,000, running from Sacramento to Salt Lake via Placerville, Hope and Carson valleys and the Hastings Cut-off, a distance of 750 miles. Mail pouches were carried on mules once a month each way, accomplishing the remarkable feat of crossing the Sierras in the dead of winter. John A. Thompson, a hardy Norwegian, crossed the 90 miles from Carson Valley to Placerville on skis in three days, carrying the mail pouch.

Covered wagons for mail and passengers followed the mule, but were not popular. Many schemes were proposed, one by the Sacramento Union in 1855, which estimated a daily mail to the western end of the railroad at the Missouri River at \$750,000. Monthly expenses were figured at \$57,000 and revenues at \$72,000. In 1855 Wm. N. Walter proposed to the California Legislature to establish a mail line with dromedaries between St. Louis and the coast, but his unusual plans never materialized.

Discussions of the mail problem naturally brought up the subject of better roads and in 1855 the California Legislature ordered a survey and appropriated \$50,000 for improvement of the old emigrant road between Placerville and Carson Valley, the state's first venture in road building. In 1858 it became a toll road operated by El Dorado County.

In 1859 General Johnston began the investigation of a shorter route, cutting off 145 miles by a route through Ruby Valley. His survey led to an established route of 565 miles.

A semi-weekly service to St. Joseph, Missouri, came with the

construction of a road from Placerville to Genoa in Carson Valley, Nevada. In 1859 a service every 17 days was accomplished. That same year saw the Nevada mining rush via Placerville and the coming of the Pony Express. By 1860 the Placerville route had been permanently established. Engineers were employed to reduce the grades, the roadway widened and substantial bridges built. Parts of the road were even macadamized. The road was sprinkled in summer and kept free from snow in winter, all expense of maintenance being met by tolls.

Samuel Bowles, editor of the Springfield, Ohio, Republican, described a trip he made over the road, marveling at making 75 miles in 7 hours, from Tahoe to Placerville.

The roads of those days were developed as a result of the public demand for service much as road work is done today, the difference being that these early roads were developed by private enterprise and paid for by tolls collected from the traffic that used them. These tolls not only paid for construction and a high type of maintenance but brought the owners a small fortune each year. In the early days, therefore, the user not only paid for construction and maintenance but a large profit as well. It is of record that the amount collected as tolls in 1863 was approximately \$600,000.

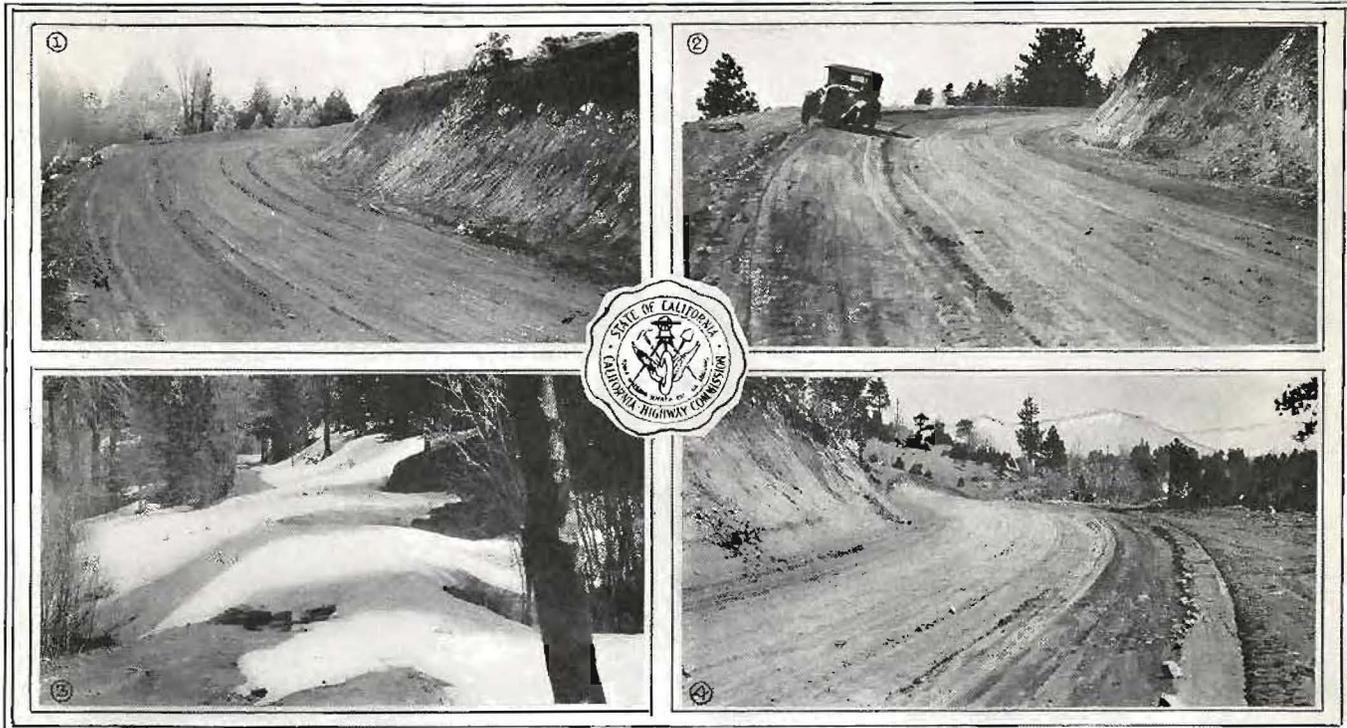
Thus was a great transportation emergency met and overcome in these early days and a great commercial road developed to be surpassed in importance only by the building of the Central Pacific Railway. During its period of service this road carried an astonishing volume of traffic. The Pioneer Stage Company operated four stages daily each way between Placerville and Carson City. Six hundred horses and fifty men were employed by the company. The receipts from freight, passenger and express business exceeded \$4,000,000 per year in 1861 and 1862. Authorities fix the amounts collected in 1863 as from \$12,000,000 to \$13,000,000. The road was traversable throughout the year. There were 93 hotels en route for the convenience and comfort of traffic. Stage stations were usually about 12 miles apart and teams were changed with lightning speed. The average rate of travel for stages was about 10 miles per hour.

In 1864 the Central Pacific was building from Sacramento to Dutch Flat and with the construction of a road from there over Donner Pass, the toll business over the Placerville road came to an end. As more rails were laid, team hauls were shortened and soon passed out entirely.

But the Placerville route remains and today is designated as the Lincoln Highway. It serves an entirely different traffic, both competing with and supplementing its rival the Victory Highway by way of Auburn and Truckee. Although it is also a through road, its greatest function is as a recreational road, taking ever increasing numbers from the interior valleys away from the heat of summer and grind of business to the bracing atmosphere of the mountains.

In recent years automobile traffic has developed to a volume far greater than the road carried in its palmiest days, but with less congestion, due to increased width of roadway and greater speed of traffic, but there is a corresponding continual and increasing demand for improvement of the road and for elimination of dust. The latter was to a considerable extent

IMPROVEMENTS FOR "RIM OF THE WORLD" DRIVE



RIM-OF-THE-WORLD DRIVE—(1) Typical view of present improvement. (2) A superelevated curve and widened roadway. (3) Snow covering old road, April 15th, 1927, avoided by new routing on south slopes. (4) View of the improved road and snow-clad mountains showing wide space on the right for parking. Note the absence of snow in the foreground—Routed upon a south slope.

Reported by E. Q. SULLIVAN, Division Engineer, Division VIII.

AT AN altitude of over 6,000 feet above the sea, with a panoramic view of orange groves and fair Southern California cities stretching beneath it, the "Rim of the world" drive, in San Bernardino County, is now undergoing reconstruction which will give this noted resort land better and modern road facilities. The present work, while only a beginning of contemplated improvements, will make the drive a "high-gear" road and, being routed over the south slopes, greater possibilities for winter travel will be assured.

This route became a state road by an act of the legislature in May, 1917. Increase in population and wealth in this region and the demand for summer homes on the uplands, made it imperative that the state take steps to establish its road with adequate right-of-way and proper alignment.

This drive, also known as the "Crest," begins at Waterman Canyon, the end of San Bernardino's county highway system, and follows the old "Crest" route, to Bear Lake. Section "A" ascends to the summit of the San Bernardino mountains, ending at Squirrel Inn. Section "B," the part now under construction, meanders along the crest of the ridge to Running Springs Park. Section "C," which was built under the direction of the U. S. Bureau of Public Roads, with state aid, in 1923 and '24, crosses a higher range to the dam at the lower end of Bear Lake; "D" and "E" following the north and south sides of the lake respectively.

The reconstruction on Section "B" is now being done by day labor, a $\frac{3}{4}$ -h.p. gas shovel being used. The first allotment of \$25,000 carried the work to March 15th, and an additional \$10,000 is supplying funds till July 1st, this year.

ROAD LOSS IN SOUTHERN STATES IS TERRIFIC.

Twelve hundred miles of main highways have been rendered impassable and thousands of miles of secondary roads have been put out of commission in the area affected by the breaking of levees and overflowing of the Mississippi River and tributaries, according to a survey of the roads of six states made by the National Touring Board of the American Automobile Association.

FRESNO PAPERS EXTEND COURTESY.

The Bulletin was last month indebted to the Fresno Bee for the use of the cut of the old Herndon Bridge and to the Fresno Republican for the front page airplane view.

Seven

Rubber Paving Blocks.

Road builders will be interested in the invention in Manchester, England, of rubber-faced paving blocks for highways. To prove that these blocks will reduce dust, noise and the danger of skidding, the inventor is paving a London street with them at his own expense.

The success of his experiment would perhaps solve the matter of the disposition of our discarded tires.

Superior First Aid.

Nell: "If a man tried to flirt with you, would you call a policeman?"

Bell: "No, a minister."—Florida Times-Union.

"TOGETHER" SPIRIT NEED IN ROAD BUILDING

(From the Los Angeles Illustrated Daily News.)

"COOPERATION and recognition of mutual problems form the key to successful highway work, members of the County Supervisors' Association of California have been told by Governor Young, State Highway Commissioner Baumgartner and Highway Engineer Morton. This fact is obvious, and absence of such cooperation at times has been a great drawback to efficient highway construction in this state.

Especially in regard to county-built roads has fault been found. Heretofore each county has built its state-aided roads without much regard to state approval or the convenience of adjoining counties. The state's share of the gasoline-tax revenue is spent on roads designated by the legislature, and it would seem wholly proper that the counties' share be spent in agreement with the state and with one another. If this were done, there can be little doubt that better coordinated improvements would be assured, on the heaviest lines of local traffic.

SHADE TREES FOR CALIFORNIA HIGHWAYS

(Continued from page 5.)

Particular attention is given the location of the plantings with reference to the pavement so that it will present no interference with its ultimate width. With this in mind, new plantings are discouraged on rights of way of less than 80 feet. In Division VIII, plantings adaptable to desert sections are propagated by the division itself. A small nursery has been established at the division headquarters at San Bernardino.

As load clearances require a clear height of 12 feet above the pavement, systematic pruning and trimming is being followed to provide this clearance and at the same time develop a symmetrical, worth-while tree. Where power or telephone lines occur within rights of way planted to trees, the tree height is limited to 40 feet, and all trimming for wire clearance is done under permit and inspection, to the satisfaction of the Highway Commission.

The state itself makes no original plantings, but does not discourage plantings by civic or other public bodies. Trees are usually secured at a nominal price from the state nursery located near Davis. The planting and care of trees during the first year is handled by interested parties or the task may be assigned to state forces by the payment of a specific sum per tree planted and maintained. After the first year's maintenance, the state assumes the burden of care and replacement in event of loss of trees.

The following species have proven their suitability in the different sections of the state as follows:

Valley section: European Sycamore, California Black Walnut, Black Locust, Blue Gum, Red Gum, Olive, Carolina Poplar, Lombardy Poplar, Silver Maple, Arizona Ash, Valley Live Oak. Of the above, the European Sycamore, Black Walnut, Arizona Ash and Black Locust are preferable.

Coastal section: Coast Redwood, European Sycamore, Black Walnut, Blue Gum, Red Gum, Coast Live Oak, Silver Maple.

Desert section: Black Locust, Arizona Ash, Blue Gum, Red Gum, Black Acacia, Athol.

Owing to the susceptibility of the Elm to the present wide spread beetle infestation, the planting of this tree in any section of the state is not advisable.

During the present season some 500 new trees have been planted, located mainly at Live Oak, Sutter County, Williams, Colusa County, and Soledad, Monterey County. Applications for additional plantings have been postponed due to the lateness of the season. It is best for community organizations interested in planting trees on the state highway to make their plans a year in advance of the planting. Present conditions indicate a successful season for tree propagation.

SAN GABRIEL DAM TO BE WORLD'S LARGEST

FIGURES on the proposed San Gabriel flood control dam, authorized by the Los Angeles County Board of Supervisors on May 18th, mark it as the largest project of its kind in the world. Bids for its construction will be received on July 11th.

The monster dam will cost \$25,000,000. It will be 385 feet above stream level and 438 above bedrock. Other measurements are: 2200 feet across top; 700 feet at bottom; 360 feet thick at bottom and 30 feet at top. The work will involve 1,350,000 cubic yards excavation, 3,250,000 cubic yards mass concrete and 3,500,000 pounds metal. Cement to the amount of 2,500,000 barrels or two years' normal output of the largest cement plant in the world, four times the amount used in any dam heretofore constructed, will be used. It will take a year for the excavation and three to pour the concrete. This will necessitate a \$2,000,000 plant and the employment of 1500 men. Five years will be the time limit on the contract.

"CLEAN UP; PAINT UP"

The California Highway Commission is sending out notification to cities and private corporations maintaining poles, that they comply with new marking regulations. The rule is that all new poles on state highway rights of way must be painted white from the ground to points six feet high. The regulation may also be complied with by the tacking of 1" x 3" white painted strips to a height of five feet to that portion of the pole visible to the passing traveler.

ROMANCE OF TRANSPORTATION IN CALIFORNIA

(Continued from page 6.)

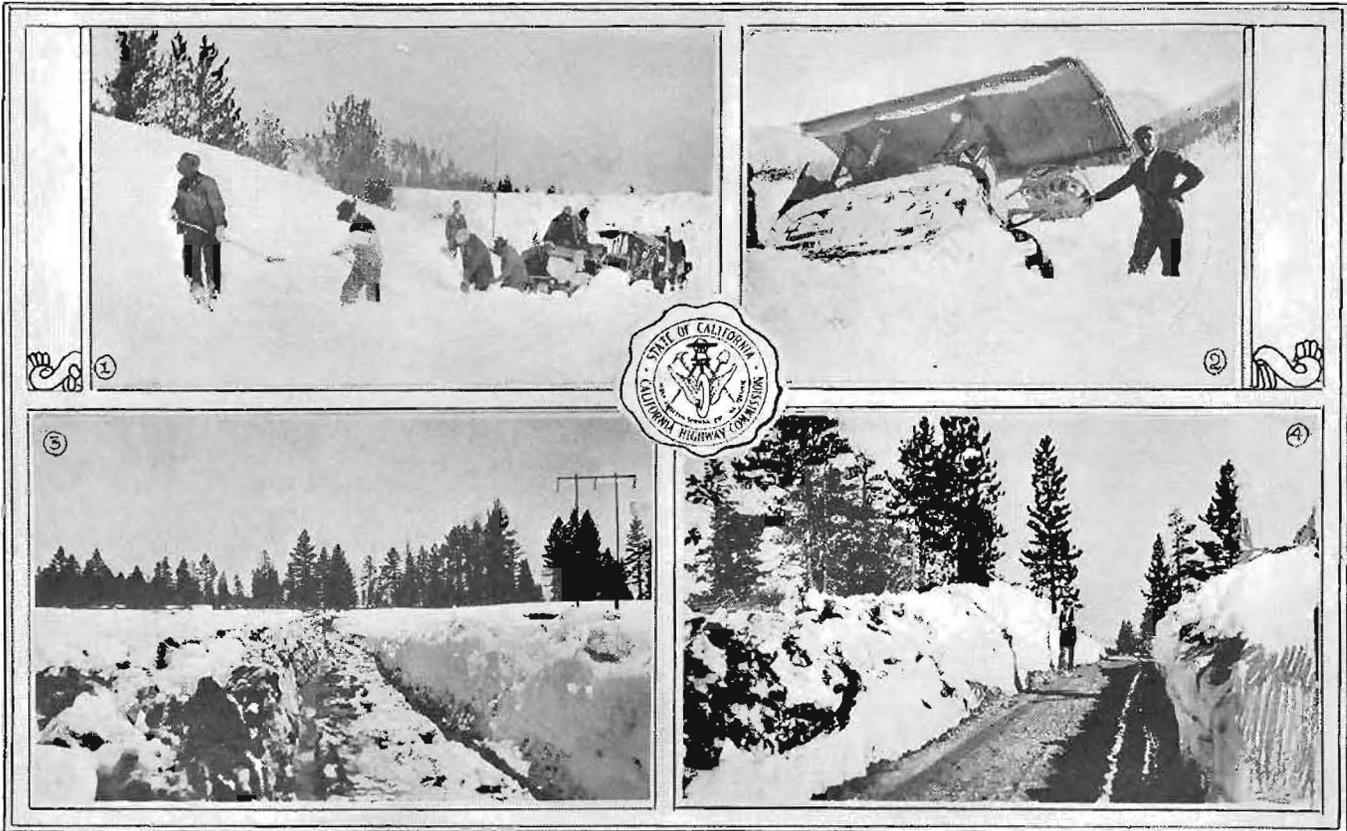
accomplished last year by oil instead of water as in by-gone days and will be more effectively accomplished next year. I have had occasion recently to go through an old biennial report of the Department of Engineering and have been interested in the comments of the commissioner. His insistent pleas for increased appropriations to enable him to make improvements commensurate with the requirements of a rapidly increasing traffic sounded very much like the arguments used today to secure appropriations for the same purpose. Thus after a period of 31 years as a state road its stage of improvement is like that of many highways in the state system, still trailing behind the traffic requirements with little immediate prospect of catching up. Nevertheless, each year brings its marked improvement. Only three years ago with the beginning of the winter rains maintenance forces were withdrawn to Camino and no attempt made to keep the road in condition beyond. In the winter of 1924-25 such blading and dragging as was possible was done between Camino and Riverton and in the winter of 1925-26 the road was kept open to Riverton.

This year a surfaced road is available through country where heretofore slippery clay has been a menace to traffic if not actually rendering the road impassable with every rain. Traffic can now reach the snow line all through the winter. The day is fast approaching when some trans-Sierra road will be kept open throughout the winter as was the Placerville road in the days when traffic required it.

As we look back over the history of this road and the service it is now rendering, and its prospects for the future, we can but say with Charles Fee, the poet of Stockton: "The road—upon its way has trod the feet of those who made its life, who blazed the trail o'er mountain pass, by lonely hill, down to the ports of men. Upon its path has walked the past with memories divine. Dust covered, dim, the wraiths of years down all its pathways shine."

Over one million six hundred thousand motor vehicles are using the California highways this year.

BLAST TO OPEN INYO-MONO SNOW PACK



FIGHTING THE SNOW IN INYO AND MONO—(1) South slope of Deadman after the April storms. (2) And 10 miles from camp. (3) After blasting followed by tractors and road graders—Nature completes the job—Deadman Summit. (4) After blasting followed by tractor and grader—South side Deadman.

By F. G. SOMNER, Division Engineer, Division IX.

DIVISION IX has been busily engaged fulfilling the promise given to the public and resort owners two months ago to have Route 23, Bishop, Inyo County, to the north boundary of Mono County, cleared of snow by the opening of the fishing season, May 1st.

Inasmuch as Route 23 crosses the Deadman Summit at an elevation of 8047 and the Conway Summit at 8155 the task was not an easy one. The snow fall was the heaviest since 1915 and the thermometer registered from 10 degrees to 25 degrees below zero during the winter months within the zone of the

heavy snow fall, resulting in packed and frozen drifts. Cold weather and snow storms prevailed during April and menaced for a time the completion of the operations by the date set.

No snow plows were available and systematic assistance to nature well in advance of the actual removal operations was the only recourse, which was accomplished by means of sanding, blasting, and plowing followed by tractors, graders, teams and fresno scrapers. The work was conducted on either side of the Deadman Summit by Maintenance Foremen Paul Peak and Ray Flynn and on the Conway Summit by Will D. Miller.

Ode to the Horse.

O horse, you are a wonderful thing;
 No buttons to push, no clutch to slip,
 No sparks to miss, no gears to strip,
 No license-buying every year,
 No plates to screw on front and rear,
 No gas bill climbing up each day,
 Stealing the joy of life away.
 No speed cop chugging in your rear,
 Yelling summons in your ear.
 Your inner tubes are all O. K.
 And, thank the Lord, they stay that way.
 Your spark plugs never miss and fuss,
 Your motor never makes us cuss.
 Your frame is good for many a mile,
 Your body never changes style.
 Your wants are few and easy met,
 You've something on the flivver yet.

—Gouvernell (N. Y.) Free Press.

IF.

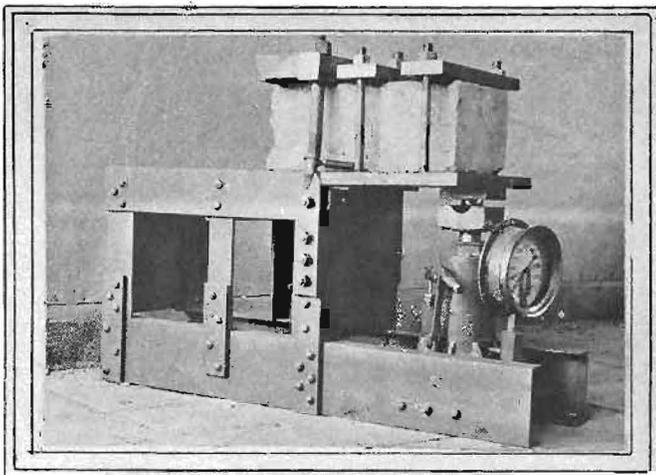
By GEORGE BANCROFT DUREN.

(With the usual apologies to Kipling.)

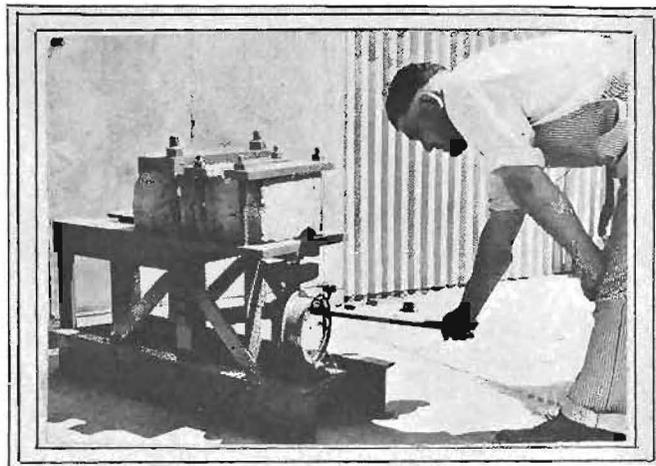
If you can climb a hill when all about you
 The cars are coughing like a kid with croup;
 If you can hit a mud road deep with puddles
 And sail across it like an ocean sloop,
 Or wear a treadless tire and not grow weary
 And blow it out in some deserted place,
 Or hit upon six cylinders entirely
 When hail and snow and rain beat on your face;
 If you can make a mile in sixty seconds,
 And yet not make the love for speed your aim;
 Then throttle down to half a mile an hour
 And never stall to smirch my name with shame;
 If you can last five years and not resemble
 A pile of junk upon some ashman's heap;
 If you can suffer lack of fuel and water
 And still ride on without a single peep;
 If you can promise me you have these virtues
 And with them all you cost a modest fee,
 Yours is this chugging world and all that's in it—
 And what is more, you are the car for ME.

—Georgia Highways.

Concrete Testing Machine Designed By Highway Engineers



First hydraulic beam testing machine made by California Highway Commission. Load applied vertically through ball over jack.



Improved beam testing machine now adopted as a standard. (Beam shown has just been broken over support.)

C. S. Pope, Construction Engineer, and C. L. McKesson, Materials and Research Engineer of the California Highway Commission, are the designers of a concrete beam-testing machine which will in future speed up the opening of concrete roads to traffic.

The method of testing concrete by means of beams in order to determine the proper time of opening has been in use in a number of eastern states for several months, but the machines ordinarily in use in other states have usually been rather crudely designed and lacked portability. The machines in use by the California Highway Commission weigh about 250 pounds and may be readily transported from place to place.

In the construction of concrete pavements, it has been the practice in California to require a curing period of 21 days. During the first 8 days the concrete is covered with earth and kept watered to insure proper hardening.

The Pope-McKesson machine has been devised for the purpose of testing concrete beams cast during the paving operations at proper intervals of time. These beams are cured under the same conditions as the concrete going into the pavement and are broken at intervals of usually 7, 10 and 14 days to determine whether or not the concrete has reached a strength sufficient to make it safe for opening to traffic.

The concrete beams are moulded to a cross section area

of 7 inches by 10 inches and are 3 feet in length. After the proper period of curing, a beam is clamped in the machine with about 12 inches projecting and subjected to the strain of a hydraulic jack until the beam breaks. The breaking strength is registered on a dial and from it, the modulus of rupture of the beam is determined by use of the proper formula.

At the present time, the requirements of the Construction Department are that the modulus of rupture shall be not less than 400 pounds per square inch.

Since this method of testing is more or less in an experimental stage, parallel samples of concrete cylinders cast at the same time that each beam is manufactured are made and these are shipped to the Testing and Research Laboratory at Sacramento for test at the same time as the beams are tested. Heretofore, all testing has been done at the Sacramento laboratory which necessitated the shipping of samples from all parts of the state to Sacramento.

With the accumulation of data which is expected from the present tests, the necessity of shipping so many specimens to the Sacramento laboratory may be avoided. Time lost in waiting for shipments to be received, tests completed and reports returned, will be largely saved. As a consequence, the time of closing the highways due to curing of concrete can be decreased with a consequent great advantage to the traveling public.

HIGHWAY NEWS NOTES.

According to the St. Helena Star the city trustees of St. Helena are using the State Highway Commission method of applying oil under pressure for the purpose of laying dust and saving the road surface.

The Fall River Mills Tidings of May 6th says: The highway maintenance crew, under Wm. Lunsford, has been doing some excellent work on the road between Big Valley Mountains and Fall River Mills, which has put the road in good condition.

Proper Training.

Football Coach (to applicant for place on team)—"What experience have you had?"

Applicant—"Well, last summer I was hit by two autos and a truck."—Boston Transcript.

America's First Macadam.

The first great highway in the country was opened in 1818. It ran from Cumberland, Maryland, to Wheeling, West Virginia, and was 40 feet wide so that "fast mail coaches at 10 miles an hour went by the slow wagons without interference." This highway was constructed of macadam, invented by the Scotch Engineer, John Loudon MacAdam, who was on its engineering staff. This road was later extended through the capitals of Ohio, Indiana and Illinois, to St. Louis. It was not paved for this entire distance, but was graded, and the wider the tires on vehicles traveling over it, the less the toll tax.—Weston's Record.

In Los Angeles.

Keep walking to keep well, the doctors advise. To be sure; and occasionally jump.

**DIVISION FLOWERS GRACE
NEW HEADQUARTERS OPENING**

A distinctive feature of the formal opening of the new Division VIII headquarters at San Bernardino was its decoration with many and varied wild flowers from all parts of the division, as related by the San Bernardino Sun.

The Mojave desert around Barstow contributed banks of yellow daisies, sunshine flowers and deep orange California poppies. From the sandy wastes of the Imperial Valley came



VISITORS ALWAYS WELCOMED—A small part of the crowd that inspected the new Division VIII headquarters at San Bernardino on April 30th.

the rich purple desert lilies whose appearance suggested they had been carefully reared in a hothouse. And there were many more: the blue larkspur from Victorville, the desert aster from Dagget and wallflowers and blue canterbury bells from the Waterman Canyon. J. E. Stanton who is an enthusiast upon desert flowers, as well as a very efficient maintenance engineer arranged the decorations.

Division Engineer E. Q. Sullivan estimated that at least 3500 people inspected the new buildings.

Boston's Traffic Jam.

Motor Cop (to professor of mathematics)—"So you saw the accident, sir. What was the number of the car that knocked this man down?"

Professor—"I'm afraid I've forgotten it. But I remember noticing that if it were multiplied by fifty, the cube root of the product would be equal to the sum of the digits reversed."—Boston Transcript.

Hit and Run.

Friend—"I suppose you didn't run across a fellow named Scrimshaw on your travels."

Road Hog—"Dunno, old man—I never stop to ask their names!"—Passing Show.

Fellow Flayers.

Son—"What is a taxidermist?"

Father—"He skins animals."

Son—"Well, what is a taxi-driver?"

Father—"He skins humans."—Cornell Widow.

Where Desire is Drowsy.

Nothing works out right. In a town where you can park as long as you want to there is no reason why you should want to.—Birmingham News.

Irish Efficiency.

"You say a clay pipe is a great time saver. How is that?"
"Faith, an' whin ye drop it ye don't have to bother pickin' it up."

Eleven

**SLOW TRUCK TRAFFIC ON
NARROW HIGHWAYS COSTLY
TO THE MOTORING PUBLIC**

Reported by E. T. Scott, Assistant Maintenance Engineer, Division VII.

THE TWO-LANE highways carrying a heavy mixed traffic of automobiles and slow moving trucks are not economical from the standpoint of the auto driver.

To the individual motorist who has to check his driving speed when he overtakes a heavy, slow moving truck, to watch for a clear road ahead, or to let a car pass that approaches from the opposite direction, before he can pull ahead of the truck, the inconvenience and loss of time is but slight. However, this very small inconvenience that one slow moving truck causes one motorist, once in a while, becomes a considerable inconvenience when several thousand autos attempt to pass several hundred slow moving trucks on the two-lane highways.

Observations for this report were made on a stretch of highway in Los Angeles County, 9.5 miles in length, from traffic counts and observations extending over a period of two years, with the idea of determining if the loss in time and inconvenience would justify a higher maintenance cost in widening highways and eliminating obstructions.

It was found that the average speed of cars was 26 miles per hour and that of the trucks to be passed, 8 miles per hour. Time lost by each auto in waiting for an opportunity to pass a truck averaged 11 seconds. It was determined that there was an average of 1,227 "passings" per hour, which, multiplied by 11 seconds and reduced to hours, showed a loss of 3.75 hours to the autoists each hour, or 60 hours in the traffic count day of 16 hours.

Assuming that there are two persons in each auto and the value of their time is 25 cents per hour and allowing 50 cents per hour for auto rental the loss to the motorists is \$60 per day or \$21,900 per year in the use of the 9.5 miles of highway on which the observations were made.

HIGHWAY PER CAPITA INVESTMENT.

Every man, woman and child in Nevada has an investment of \$130 in the highways of the state, according to figures recently compiled by the Nevada State Highway Department.

With the same per capita in California the Gold State ought to have \$600,000,000 invested in state highways. The real figures show but one-fourth that amount, however, putting the per capita for California at \$33.

Extravagance.

Ike: "Look, pap, Abe's cold is gone, and ve still got left a box of cough drops."

Father: "Oh, vat extravagance; tell Herman to go and get his feet wet."—Florida Highways.

When Noah sailed the waters blue

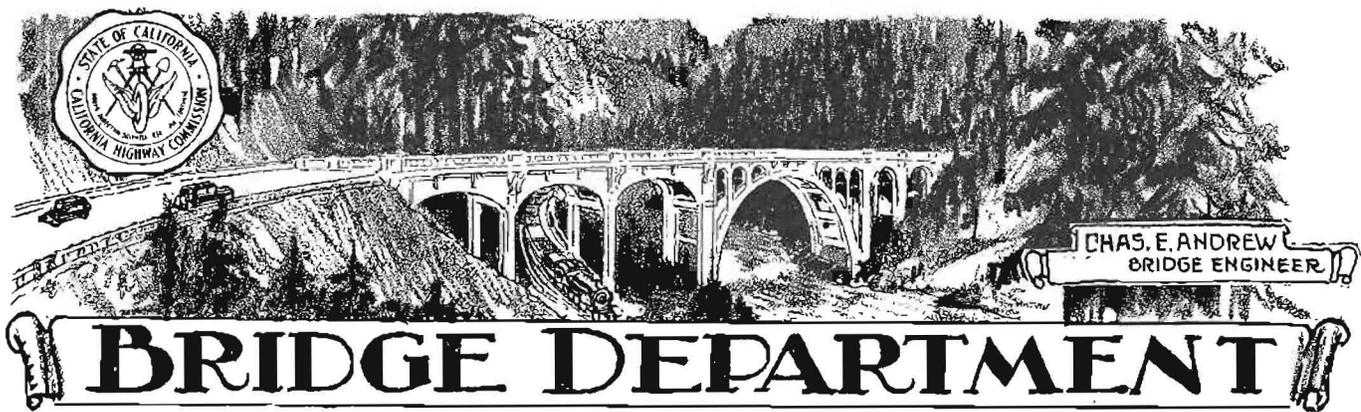
He had his troubles, same as you.

For forty days he drove the Ark

Before he found a place to park.—Exchange.

FORTUNES OF THE BALL TEAM.

Manager Marion McGriff of the central office ball team is having his troubles. He started the Twilight League season with a 11-2 win over the Rauels who have protested his pitching of Montijo, a supposed ringer. On the 23d he pitted his road men against the Divine Grocery, being shut out 11 to 0.



**CHARLES E. ANDREW, NEW
STATE BRIDGE ENGINEER**

CHARLES E. ANDREW, who has been bridge engineer for the highway commission of the state of Washington since 1920, has been appointed bridge engineer in the California Highway organization.

Mr. Andrew qualified on the civil service list as a result of examination held this spring and his appointment is effective May 1st. He fills the position formerly held by Harlan D. Miller, who died in October, 1926.

Mr. Andrew has had wide experience as a bridge engineer in the states of Oregon and Washington. He is a graduate of the University of Illinois, and for some time was in the employ of Ralph Modjeski, nationally known bridge engineer, in whose service he came to Oregon in 1906.

His work in the northwest has included the building of many notable structures in the Puget Sound territory and elsewhere in Oregon and Washington. Mr. Andrew is widely and favorably known as a bridge engineer throughout the west. The California Highway Department is fortunate in securing his services.

Eaton Canyon Wash Bridge.

A reinforced concrete bridge 160 feet long with 40-foot roadway and two 6-foot sidewalks has been built recently under the direction of Guy Mapes to replace an old structure across Eaton Canyon Wash at the city limits of Pasadena (VII-L.A.-9-E). The city of Pasadena surfaced the approaches. The flood waters of February 15th washed out the detour across the wash and in order to accommodate traffic the bridge was opened before all work was finished.

Bridge Moved Without Suspension of Traffic.

An interesting feature in the construction of a bridge-widening job recently completed in Southern California was the moving of the old structure under traffic. This is the four-steel span bridge over the Rio Hondo in Los Angeles County, route 2-D, between Los Angeles and Whittier. The original bridge built in 1921 provided a 24-foot roadway now inadequate for traffic. It was decided to build a duplicate structure parallel to the old and in order to make the completed crossing symmetrical about the center line, the old portion was moved 15 feet. This work was accomplished without the inconvenience and expense of a detour and without delay to the contractor. The completed bridge now provides a total roadway width of 48 feet which will be sufficient to carry the traffic for some time. A. S. Kennedy, resident engineer, had charge of the work.

New San Ardo Structures.

Three more narrow, obsolete and antiquated stream crossings have been eliminated from the Coast highway in Monterey County by the construction of modern structures near San Ardo about twenty miles south of King City. The two major crossings are 250-foot reinforced concrete trestles and the third a concrete box culvert under a fill on a line change. The two new bridges cross deep arroyos with the grade line in each being about 60 feet above the stream bed. At the location of the culvert the road was built on a new alignment which replaced four sharp curves with one of 1500-foot radius.

The line change at the new culvert involved the grading and surfacing of about 2100 feet of paved roadway, an experiment being made in the use of Laykold or emulsified asphalt as a binder material. The results appear to be very satisfactory.

The problem of preventing damage to the footings by erosion of the stream beds was solved by the construction of a cement rubble overflow dam about 75 feet downstream from both of the bridges. The crests of these dams were built at about the elevation of the ground at the bridge, which will result in the flow of the stream being checked with the tendency to silt up rather than scour. George J. Porter was resident engineer. The total cost of the work was approximately \$85,000.

La Placerita Creek Bridge.

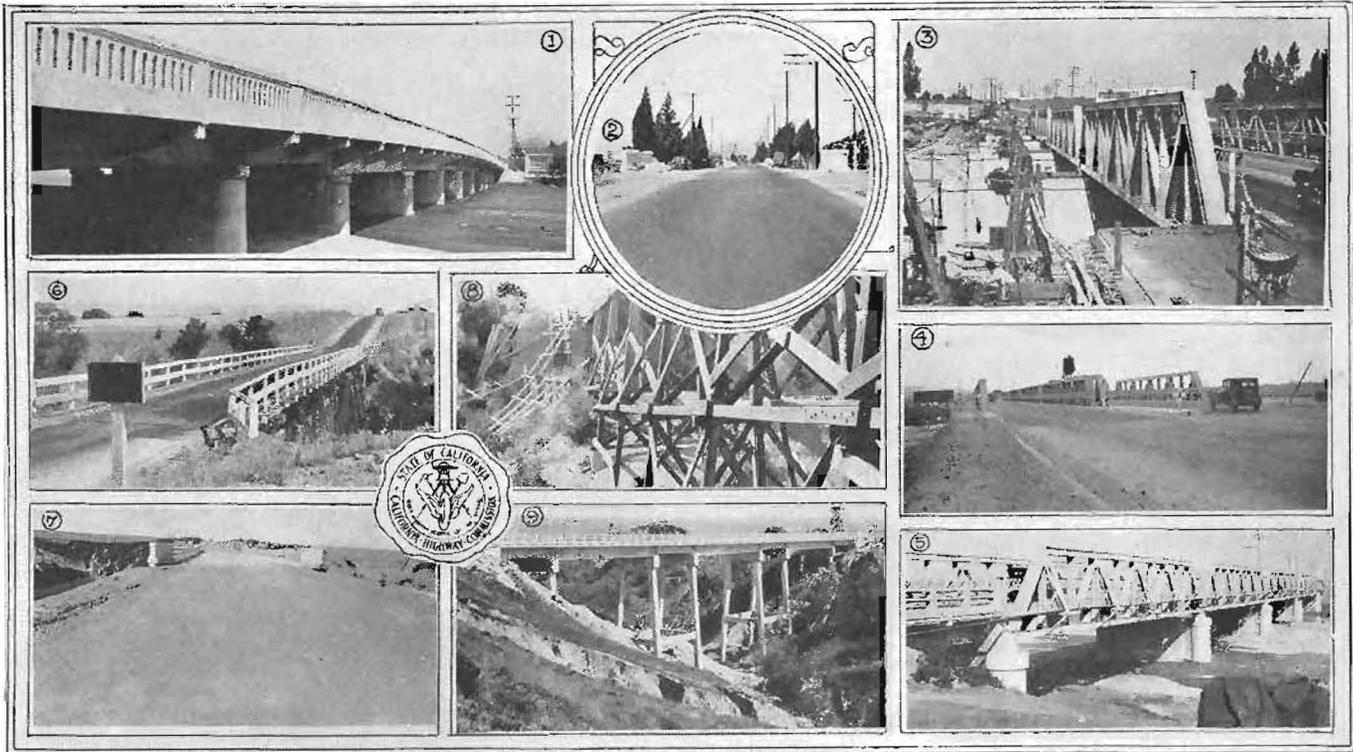
Cutting the time between the pouring and driving of concrete piles from 28 days to a minimum of one day was the result obtained in the construction of the two La Placerita Creek bridges (VII-L.A.-4-E) by the use of Lumnite cement. These bridges are 18-foot skewed deck slabs on reinforced concrete pile bents. The bridge across the main channel consists of six spans while the smaller bridge is but 18 feet in length. The curb and rail conform to the highway standards and both bridges have a 30-foot roadway and 4-foot sidewalk.

Santa Ana River Bridge.

Another bridge to be opened to traffic within the last few weeks is a 564-foot concrete structure crossing the Santa Ana River between Santa Ana and Anaheim (VII-Ora.-2-D). It consists of five 54-foot spans and eight 37-foot spans with a 40-foot roadway and two 6-foot sidewalks. The piers and abutments of the old bridge were extended to carry the new structure. This contract also included grading and paving the approaches and protecting the approach fills with concrete slope paving. George Thompson and A. L. Richardson were the resident engineers. The state received Federal aid on this project, total cost of which was nearly \$110,000.

Storm Damaged Trestle Replaced.

Over 200 feet of the San Dieguito slough trestle bridge (VII-S.D.-2-A) have been rebuilt, following storm damage, under the direction of M. E. Whitney, resident engineer.



MODERN STRUCTURES SUPPLANTING OUT-OF-DATE BRIDGES—(1) Fine new structure just completed across Santa Ana River, between Santa Ana and Anaheim. (2) La Placerita Creek bridge, Los Angeles County, showing width of roadway to take care of future travel. (3) Same bridge being moved without stopping traffic, and (4) widened and completed for two-way travel. (5) Old Rio Hondo River bridge between Los Angeles and Whittier. (6) and (7) Views of same structure showing comparative roadway width and site view. (8) and (9) Before and after views of trestle beneath San Ardo structure in Monterey County.

AN EPITAPH ON BAD ROADS.

They took a little gravel,
And took a little tar,
With various ingredients
Imported from afar;
They hammered it and rolled it,
And when they went away
They said they had a good street
To last for many a day.

They came with picks and smote it,
To lay a water main,
And then they called the workmen
To put it back again.
To lay a railway cable
They took it up once more,
And then they put it back again
Just where it was before.

They took it up for conduits,
To run the telephone,
And then they put it back again
As hard as any stone.
They tore it up for wires
To feed the 'lectric lights;
And then they put it back again,
And were within their rights.

Oh, the street's full of furrows,
There are patches everywhere;
You'd like to ride upon it,
But it's seldom that you dare.
It's a very handsome street,
A credit to the town;
They're always digging of it up
Or putting of it down.

—Washington Post.

THE CARQUINEZ BRIDGE

REGARDLESS of the fact that the Carquinez Bridge, built by the American Toll Bridge Company and opened to the public on May 21st, is a private enterprise, the California State Highway Commission is taking more than a passing interest in it owing to the fact that the Pacific Highway and many other state road routes will direct traffic to the new bridge. The amount of traffic the bridge is called upon to accommodate will have a direct bearing on future state highway construction in that region.

The new bridge is the largest highway bridge in the world and provides a continuous overland highway from Canada to Mexico and unites Northern California and portions of Central California with the bay district metropolitan area. It bridges Carquinez Straits from Vallejo, Solano County, to Crockett, Contra Costa County.

Hidden in the cold figures of the giant span are some unusual facts. It is 4482 feet long, of cantilever type, with four cantilever arms and two suspended spans. The two cantilever spans, including the suspended spans are 1100 feet long. More than 45,000 cubic yards of concrete and 12,600 tons of steel were used. It is 135 feet from the water and 460 feet from bedrock. Ten of the largest anchors ever used west of the Rockies, each weighing 8½ tons, hold the structure. Two miles of two-inch chains were used to sink the caissons.

ROAD ITEMS

According to reports of the Department of Agriculture, there are 560,000 miles of surfaced highways in the United States.

Mexico has a federal road system under construction comprising 1337 miles of highway, on which \$6,000,000 is being spent annually.

The state road budget for Illinois for 1927 is \$70,000,000.

WHAT THE DIVISIONS ARE DOING

DIVISION III.

HEADQUARTERS, SACRAMENTO.

F. W. HASELWOOD, DIVISION ENGINEER.

Counties of Butte, Colusa, El Dorado, Glenn, Nevada, Placer, southern Plumas, Sierra, Sutter, Yuba, and northern Sacramento and Yolo.

Work Started at Tahoe.

After delay on account of the late season, both maintenance and reconstruction crews are now busy at Lake Tahoe. It is expected that the grading and rock surfacing will be completed this season between Tahoe City and Meeks Bay. A contract was recently awarded to Hemstreet and Bell of Marysville for 20,000 cubic yards of rock surfacing on this road. Near Emerald Bay the gas shovel has been put to work and will operate on double shift most of the season.

Truckee River Highway Work.

Improvement of the Truckee River highway between Truckee and Verdi is in progress. Nevada is paving with Portland cement concrete the four miles between Verdi and the California state line and the 19 miles from Truckee to the state line in California is being oiled. Work on this road both in Nevada and California will be completed in time to serve travel to and from the Highway Exposition in Reno, which opens June 25th. Hemstreet and Bell made excellent progress on this road crushing and spreading 10,500 cubic yards of rock in 41 days from March 17th, to May 5th, averaging 256 cubic yards per day.

Work on Tahoe-Ukiah.

A. Haidlen Company recently completed their contract for grading from Nevada City to Harmony ridge, a portion of the Tahoe-Ukiah route. The new grade, while only 16 feet wide and subject to further improvement, eliminates the steep grade on the present county road.

Four Oil Outfits Busy.

Application of oil to graveled roads is proceeding rapidly throughout the division. Four oil-distributing outfits are at work continuously. Oil is being applied as a dust layer, as a seal or by mixing, according to the condition of the road.

Personal Notes.

J. L. Piper, who has been with the Commission for fifteen years, has asked for a leave of absence on account of ill health. Mr. Piper will be missed in the division and our best wishes for a speedy recovery are extended to him.

E. J. L. Peterson, formerly employed as draftsman, has been in charge of the grading on Nev-15-C between Nevada City and Harmony ridge. He is now assisting in the oil mixing operations beyond Truckee.

Ed Willis returned to his old haunts at Tahoe City early in May. He had to plow off several feet of snow to find a road to work on.

Federal Work Near Tahoe.

The Isbell Construction Company has resumed work surfacing the road between Truckee and Tahoe City. This road is being built under the supervision of the Bureau of Public Roads from Forest Highway funds. Negotiations are in progress for the construction of a subway under the Southern Pacific near Truckee and an overhead crossing of the same railroad combined with a crossing of the Truckee River about five miles north of Tahoe City.

On the Placerville-Lake Tahoe road, the Bureau of Public Roads recently awarded to Irey and Holden a contract for completing the grading and rock surfacing, between Pacific House and Riverton. Work is under way.

DIVISION VI.

HEADQUARTERS, FRESNO.

E. E. WALLACE, ACTING DIVISION ENGINEER.

Counties of Fresno, Madera, Merced, Mariposa, Kings, Tulare, and Kern, north of the Tehachapi.

Improving All-Year Highway.

DIVISION VI is concentrating its energies on getting the Yosemite All-Year road widened and oiled for the summer traffic. Oiling by the mixing method is progressing at the rate of a mile a day. Rock surfacing is practically complete and a heavy grading outfit is widening the roadway and eliminating the worst curves. By the first of July, a wide, smooth, oiled road will connect the pavement at Planada with that at El Portal.

Opening Canyon Road.

A crew of men are opening the road to Hume in the Kings River Canyon. Due to exceptionally heavy rain and snow-falls, this road is blocked by slides and fallen trees and it is estimated that it will take a week's work to open a trail.

Sequoia Park Road Ready.

It is planned to oil the unpaved section of Route 10 from Three Rivers to the Sequoia Park boundary, to connect with the oiling work being done by Colonel John R. White, Superintendent of the Park. Curves on this road have been widened with oil or waterbound macadam and the road is in good shape for the summer traffic.

Working On Valley Route.

Rapid progress is being made by crew under Thomas Eastman widening the roadway, filling borrow pits and eliminating irrigation ditches inside the right of way, on the main Valley road south of Fresno.

DIVISION VII.

HEADQUARTERS, LOS ANGELES.

S. V. CORTELYOU, DIVISION ENGINEER.

Counties of Los Angeles, Ventura, Orange, San Diego, and eastern Kern, south of Mojave.

56-Foot Highway in Orange County.

ALL WORK has been completed on the reconstruction of the highway in Orange County, from the easterly limits of Santa Ana to Tustin. The new highway is paved with concrete 56 feet wide between curbs. The cost of half the reconstruction work was paid for by an Orange County Improvement District. Griffith Company were the contractors and J. B. Hodges, Resident Engineer, supervised construction. Orange County furnished part of the field inspection and gave excellent cooperation in every way in carrying on this work.

Mountain Springs Grade Work.

The Mountain Springs Grade job is progressing rapidly. Grading operations are in progress, improving the alignment, on a quarter-mile stretch at the lower end of the grade, but from this point up the grade to Mountain Springs, a distance of 5 miles, the 20-foot concrete pavement has been completed and opened to traffic. Between Mountain Springs and Boulder Park at the top of the grade pavement has been completed half width, 10 feet, and opened to traffic. One-way controls regulate travel.

Reconstruction in San Diego County.

Work has been started on the reconstruction and widening of the state highway in San Diego County between La Mesa and El Cajon. The new pavement will be of concrete 20 feet wide, with 2-foot crushed rock shoulders. C. P. Montgomery, resident engineer, who recently completed his work on the Malibu grading and paving job in Los Angeles County, on the Oxnard-Capistrano highway, has been assigned to this contract.

News Notes.

Concrete pavement and curbs are now being placed through the town of Laguna, on the Oxnard-Capistrano highway in Orange County.

R. L. Thomas, resident engineer, has been assigned to special reconnaissance work and A. D. Griffin has taken Mr. Thomas' place as resident engineer on the Laguna job.

HIGHWAY NEWS NOTES

Thornton K. May, who has been temporarily employed with the Montana Highway Commission, has returned to the Bridge Department.

Walter Wesch, a former employee of the Bridge Department, recently returned from Montana where he was employed as engineer in charge of bridge design for the Montana Highway Commission.

George J. Ulrich of Modesto has been awarded the contract for the construction of Pacheco Creek Bridge, road V-S.Bt.-22-B. H. E. Fearnall, resident engineer, who has been assisting A. S. Kennedy, at Klamath River Bridge, will have charge of the work.

W. A. Douglass, recently resident engineer on timber bridge construction in Imperial County, has been assigned to the office for work in the Construction Department.

J. C. Wilson has completed on his work the contract for widening the four bridges across Vejour, West Vejour, Conejo and Las Virgins Creek in Los Angeles and Ventura counties, and is now enjoying a short vacation.

Stanley Kimball, Assistant Resident Engineer, has been assigned to work on the Klamath River Bridge.

We are late in going to press with the report of the prowess of Henry E. Kuphal, whose rare accomplishment in leading the rabble in the golf tournament at the Arcade Course has already been broadcasted in our leading periodicals.

The Western Construction News of San Francisco in its issue of April 25th reproduced our article and drawings, explaining graphic charts and their use in bridge design by Harvey D. Stover, office engineer in the Bridge Department, Sacramento. More articles of this nature are desired by California Highways.

**REDLANDS NEWSPAPER MAN
PAYS TRIBUTE TO ENGINEER**

Lyman M. King, editor of the Redlands Daily Facts and a prominent figure in state affairs, writes the following to E. Q. Sullivan, Division Engineer of Division VIII:

"Up in Redlands we have appreciated very much the fine attention you have given to the roads in this part of your division. Certainly if all the divisions are as well handled, and with as much attention to the desires of the people, the state is well served."

DIVISION IX.

HEADQUARTERS, BISHOP.

F. G. SOMNER, DIVISION ENGINEER.

Counties of Inyo, Mono, and eastern Kern County, north of Mojave.

ON THE Mojave Desert the construction of paved dips is in progress to provide for the flows from the Los Angeles city aqueduct and to carry storm waters at other points.

A contract has been awarded to Harry Wilson of Lone Pine for the surfacing with screened decomposed granite five miles south from Independence.

Alignment improvements and surfacing six miles with decomposed granite south from Big Pine is well under way.

Surveys have been completed for relocation of a distance of 50 miles from Lone Pine to Little Lake, with preparations of plans and estimates under way.

Division IX has been visited recently by T. H. Dennis, Acting Maintenance Engineer, and F. L. Richardson, Assistant Equipment Engineer.

DIVISION X.

HEADQUARTERS, SACRAMENTO.

R. E. PIERCE, ACTING DIVISION ENGINEER.

Counties of Amador, Calaveras, Alpine, Tuolumne, Stanislaus, San Joaquin, Solano, and southern Sacramento and Yolo counties.

Mossdale Bridge Approaches.

THE SAND fill on the Mossdale bridge approaches is progressing slowly on account of difficulties in getting the plant in operation and delay in the bridge construction work.

The west approach is completed and work is progressing on the east approach.

Oiling Program.

The oil surface treatment program in Division X commenced on the first of May with two major crews; one in Amador County between Ione and Jackson under foreman H. S. Clark, and the other in Calaveras County between Valley Springs and San Andreas, under foreman W. H. Martin.

Contract No. DM-238.

Under recent informal contract, A. Teichert & Son, Inc., have completed approximately 900 feet of asphaltic concrete pavement north of Turlock over new right of way, connecting the state highway with the city limits at North Center street.

Contract No. DM-248.

In Solano County on Route 7 between Putah Creek and Dixon, the roadway has been widened under informal contract No. DM-248, awarded to L. D. Moore. Crushed rock borders, 2 feet wide, were placed by state forces. This road on account of the narrow shoulders, composed chiefly of adobe soil, has been dangerous especially during wet weather; this widening should make a safer road.

Personal Items.

L. D. Kelsey, employed as instrumentman with Division X, is now working for the city of Berkeley on valuation work.

Van G. Horton, formerly employed with the highway commission, is working on survey with this division.

FROM AFRICA AND CHINA.

THE fame of California has traveled far, but it appears that construction and maintenance practices followed by the State Highway Department are attracting equal attention in distant lands. On the same day, recently, the BULLETIN received two clippings, one from *The Standard*, published in Nairobi, British East Africa, and the other from the *Shanghai Mercury*, of Shanghai, China, both quoting the State Highway Engineer of California.

The Nairobi paper republished, in full, a long article telling of the oiling of California highways to eliminate dust and reduce maintenance costs. The item in the Shanghai paper was a discussion of standards of construction.

A GREAT deal of the joy of life consists in doing perfectly, or at least to the best of one's ability, everything which he attempts to do.

There is a sense of satisfaction, a pride in surveying such a work—a work which is rounded, full, exact, complete in all its parts—which the superficial man, who leaves his work in a slovenly, half-finished condition, can never know.

It is this conscientious completeness which turns work into art, the smallest thing, well done, becomes artistic.—William Mathews.

STATE HIGHWAY FUND CONTRACTS (Bond Funds, Including Federal Aid)

Cont. No.	Division	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
513	VII	Ventura.....	60	A	COMPLETED AND ACCEPTED SINCE APRIL 13, 1927. Between Osnard and Huene Road.....	4.99	Grading and P.C.C. Pavement.....	United Cone. Pipe and Const. Co....	\$174,319 88	July 31, 1926	-----
522	V	San Benito.....	22	B	AWARDED SINCE APRIL 13, 1927. Across Pacheco Creek.....	8.15	R. C. Girder Bridge.....	George J. Ulrich.....	\$27,801 56	May 11, 1927	150
523	I	Humboldt.....	1	K	Between Orick and Section 36—T. 12N., R. 1E.....	8.15	Grading and Rock Surfacing.....	W. H. Hauser.....	229,469 70	May 11, 1927	150
524	I	Humboldt.....	1	K	Between Sec. 36—T. 12N., R. 1E. and the northerly boundary.....	6.77	Grading and Rock Surfacing.....	Engelhart Paving and Const. Co....	280,955 24	May 11, 1927	175
Total State Highway Fund Contracts Awarded.....						14.92	-----	-----	\$538,226 50	-----	-----

NOTE.—Primary construction covered by the above contracts does not include funds obligated on cooperative forest highway projects, prison camp road activities, or day labor jobs not being done under contract.

STATE HIGHWAY MAINTENANCE FUND CONTRACTS (Including Gasoline Tax Fund)

Cont. No.	Division	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
M-119	X	Stanislaus.....	4-13	B-A	COMPLETED AND ACCEPTED SINCE APRIL 13, 1927. Between Modesto and Stanislaus River and between Salida and McHenry Road.....	12.67	P.C.C. Widening and A.C. Surface.....	Valley Paving and Const. Co.....	\$263,489 17	April 23, 1926	-----
M-125	V	Monterey.....	2	H	Between San Ardo and Bradley.....	-----	One Culvert and Two Bridges.....	Granite Construction Co.....	95,492 81	May 7, 1926	-----
M-130	VII	Orange.....	2	D	Across Santa Ana River 2 miles north of Santa Ana.....	-----	R. C. Girder Bridge.....	Charles and F. W. Stoffgen.....	116,859 49	June 8, 1926	-----
M-133	VIII	Riverside.....	26	E-F	Between Indio and 6 miles south of Coachella.....	8.90	P.C.C. Widening and A.C. Surface.....	Southwest Paving Co.....	210,104 68	July 14, 1926	-----
M-138	V	Monterey.....	2	D	Across Salinas River, 1 mile south of Soledad.....	-----	Refloor and Paint Steel Bridge.....	Atlas Const. Co.....	47,319 63	Aug. 28, 1926	-----
M-147	VII	Orange.....	2	C	Through Tustin.....	1.51	Grading and P.C.C. Pavement.....	Griffith Co.....	72,021 97	Sept. 28, 1926	-----
AWARDED SINCE APRIL 13, 1927.						-----	-----	-----	-----	-----	-----
M-168	IV	Alameda.....	5	B	Between Livermore and Dublin.....	8.00	Portland Cement Concrete Pavement.....	N. M. Ball.....	\$361,635 30	May 11, 1927	125
Total State Highway Maintenance Fund Contracts Awarded.....						8.90	-----	-----	\$361,635 30	-----	-----

NOTE.—The above obligations charged against the State Highway Maintenance Funds do not include funds from these sources obligated for general maintenance and for specific betterments being done under day labor authorization.

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CALIFORNIA HIGHWAYS.