

# CALIFORNIA

## HIGHWAYS AND PUBLIC WORKS

MAY - JUNE  
1946



# CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official Journal of the Division of Highways, Department of Public Works, State of California

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# State Government Moves to Solve Critical Lumber Shortage Problem

A Forest-to-Market Conference was held in Sacramento May 13th at the call of Governor Earl Warren. Its purpose was to find ways and means for bettering highway transportation facilities in lumber-producing counties of Northern California.

Pursuant to the expressed wish of the conference, engineers of the Division of Highways are completing studies on each of some 30 mountain roads and highways designated by the conference as bottlenecks to the movement of lumber urgently needed to alleviate the housing shortage, particularly as it affects veterans' needs.

A report and recommendations on the findings of the Division of Highways will be submitted by State Highway Engineer George T. McCoy to the California Highway Commission at its meeting on June 19th.

Members of the commission will see for themselves some of the road bottlenecks in lumber areas to which attention was called at the Forest-to-Market Conference. The commissioners will leave Sacramento on Wednesday, June 19th, for a seven-day tour through Tehama, Shasta, Siskiyou, Trinity, Modoc, Lassen, Plumas, and Butte Counties.

The commission is particularly interested in U. S. 299 from Redding through Douglas City in Trinity County to Arcata in Humboldt County. It already has appropriated approximately \$600,000 to improve a hazardous section of this route from Old Shasta to Schilling.

Thereafter, as requested by Governor Warren, the commission, headed by Director of Public Works C. H. Purcell, and McCoy and his engineering staff will meet with representatives of the U. S. Public Roads Administration, the U. S. Forest Service and the Division of Forestry, Department of Natural Resources, to jointly explore the problem involved, especially as it relates to the raising from all available and potential sources of funds which will be required to immediately improve or expand highways carrying lumber traffic.

Meanwhile the U. S. Public Roads Administration is rushing to completion two forest highway projects on

State Route 25, between Nevada City and Downieville and on U. S. 50, the Placerville-Lake Tahoe route.

**During 1944 approximately 10,000,000 board feet of timber moved over Route 25 and approximately 71,000,000 board feet of logs and lumber were transported over U. S. 50.**

The contract for widening and realigning 3.64 miles of the Nevada City-Downieville highway between the Middle Fork of the Yuba River and Wilson's Cabin was awarded September 18, 1945, to H. Earl Parker of Marysville. The amount of his bid was \$390,210.10. Work started October 9th with a contract time of 300 days. The project is about 66 per cent complete. The highway is being built to a 26-foot paved width with a 7 per cent maximum grade and 200-foot radius of curvature.

On U. S. 50, a section 3.1 miles in length is being realigned between Fresh Pond and Pollock Pines. This contract also was awarded to Parker on March 13, 1946, on his bid of \$470,032.50. Work started March 26th with a contract time of 250 days. The project is about 7 per cent complete. The highway is being constructed with two 11-foot surfaced lanes and 5-foot oiled shoulders over most of the distance with additional widths in two sections to facilitate passing loaded trucks on adverse grades. The maximum grade is 7 per cent with a 700-foot minimum radius of curvature.

In attendance at the Governor's conference were representatives of U. S. Public Roads Administration, the United States Forest Service, State Department of Public Works, California Highway Commission, Department of Natural Resources, State Board of Forestry, members of boards of supervisors and other spokesmen from 17 lumber producing counties, members of the Joint Legislative Interim Committee on Highways, Streets, and Bridges, the Senate Interim Committee on Forestry, the District Forest Practices Committee, the Citizens' Advisory Committee on Development of Natural Resources, the Home Building Committee of the Reconstruction and Reemployment Commission, and representatives of the

lumbering and trucking industries of California.

Among the speakers were Ronald Campbell of the David D. Bohannon Organization, San Mateo; Regional Forester S. B. Show, U. S. Forest Service, San Francisco; C. C. Morris, Division Engineer, Public Roads Administration, San Francisco; C. H. Purcell, Director of Public Works and Chairman of the Highway Commission; E. Guy Warren, President California Truck Owners' Association; W. R. Schofield, California Forest Protective Association; Congressman Clarence F. Lea, Santa Rosa; George B. McLeod, President Hammond Lumber Company; E. J. Regan, District Attorney of Trinity County; Senators George M. Biggar, Covelo; Oliver J. Carter, Redding; Louis Sutton, Colusa, Frank L. Gordon, Napa County, and H. E. Dillinger, Placerville, and Assistant State Highway Engineer Fred J. Grumm.

Addressing the Forest-to-Market Conference, Governor Warren summarized the purpose of the meeting in the following words:

#### MAJOR POSTWAR PROBLEM

"One of California's major postwar problems is the lack of adequate roads and highways in the forest areas for the transportation to market of lumber urgently needed to relieve the present housing shortage.

"I have requested you to attend this conference because I hope that through discussion of the situation we can work out at least a partial solution.

"How the flow of sorely-needed lumber from forest to market may best be speeded up is a matter that vitally affects each and every one of you. It affects the State and Federal agencies and political subdivisions and private industry which you represent.

"I think we should confine ourselves today only to emergency proposals which if acted upon immediately will result in more lumber being made available for use in home construction, particularly for veterans, later this year or early next year.

#### CONCERNED OVER VETERANS

"I am especially concerned and I am sure that all of you are, over the





New forest highway between Fresh Pond and Pollock Pines on U. S. 50 takes shape.

desperate situation in which our veterans find themselves, with regard to housing for themselves and their families. We have done everything within our power to facilitate the acquisition of homes by veterans.

"We have reduced the interest rate on veterans' loans from 5 per cent to 3 per cent and increased the maximum loan limit from \$5,000 to \$7,500 on homes and from \$7,500 to \$15,000 on farms.

"We have submitted to the people of California a \$100,000,000 veterans' bond act which will be on the November ballot.

"We are now engaged in administering a \$30,000,000 bond issue

(Continued on page 31)



Heavy rock excavation in progress on realigned section of State Route 25





Section of new highway between Nevada City and Downieville—old route follows hazardous curve above new road





Looking from Windmill Hill toward Shingle Springs, showing clearing and old pioneer grading. Existing highway in middle ground

## Eliminating 29 Curves on U. S. 50 Between Shingle Springs and El Dorado

By SCOTT H. LATHROP, Assistant Highway Engineer

**M**ODERNIZATION of the portion of U. S. Route 50 between Sacramento and Lake Tahoe was advanced another step in March of this year when construction was started on a project extending from Shingle Springs to  $1\frac{1}{4}$  miles west of El Dorado.

In addition to being a link in one of the two mid-state major transcontinental highways, this section of road serves not only an extensive lumber industry but is a scenic and recreational area which is considered to be one of the finest in California. Both the American River Canyon and the Lake Tahoe region are very attractive, as is attested by the thousands of vacationers who visit these localities each year.

During peacetime this road was kept open all year and as a result an increasing number of winter sports enthusiasts have availed themselves of the excellent facilities for such recreation which are to be found in this area.

In February, 1857, President Pierce approved a congressional appropriation of \$300,000 for a wagon road from Fort Kearney, via South Pass of the Rocky Mountains and Great Salt Lake Valley to the eastern boundary of California, near Honey Lake.

Immediately, Californians set to work to raise funds for a road over the Sierra to meet the projected Federal road at Honey Lake. On May 11, 1857, representatives of Sacramento, El Dorado and Yolo counties met in Sacramento. Twenty thousand dollars were subscribed by Sacramento, an equal amount by El Dorado and \$10,000 by Yolo.

Finally in November, 1858, the road linking Sacramento and Placerville with Carson Valley was completed and now, with changes made through the years, is known as U. S. 50.

The section of road which is now being improved lies in rolling foothill country. When the highway was built in 1915 the traffic was much lighter

than now and maximum average driving speeds were very much lower. In accordance with the standards applicable to those conditions, the original pavement width was only 12 feet and many of the horizontal curves used had radii as short as 100 or 200 feet. During the succeeding years the width of the pavement was increased by the addition of borders on both sides and the sharp curves were eased where feasible. Due to alignment controls and other limiting factors, however, complete adaptation to modern traffic requirements was impossible without reconstruction such as is now being undertaken.

The reconstruction of this project is on revised alignment throughout and makes a saving in distance of 0.4 mile. **Where the old road had 35 curves with a total central angle of over 1020 degrees the new alignment has only 6 curves, with a total central angle slightly less than 142 degrees.**

(Continued on page 11)



# DONNER PARTY CENTENNIAL

By THOS. E. STANTON, Materials and Research Engineer

**T**HIS year marks the centennial of the arrival at the eastern base of the Sierras of the emigrant party, originally designated the "Reed-Donner Party" but subsequently called the "Donner Party" after the selection, en route, of Geo. Donner as captain.

It was 28 years ago, on June 6, 1918, that the imposing monument to the pioneers and the Donner Party, on the shore of Donner Lake, was dedicated.

The Donner party left Independence, Missouri, on May 12, 1846, but the last of the survivors did not reach Sacramento (New Helvetia), until the spring of 1847, almost a year later.

Delays for one reason or another occurred all along the line, with the result that the bulk of the party did not arrive at the eastern foot of the Sierras until late in 1846 after early winter snows had acquired considerable depth, thus hampering the progress of the party which included quite an appreciable percentage of children.

The winter of 1846-47 was exceptionally severe and the snowstorms so frequent and heavy that the inexperienced emigrants were not only unable to make their way over the mountains to Sacramento, but also unable to secure enough food, through shooting or trapping, to properly sustain life, with the result that out of a total of 81 who encamped for the winter

at various spots between a point on Alder Creek just east of Truckee and the easterly end of Donner Lake, where the Pioneer (Donner) Monument now

stands, 36 perished during that winter, either in camp or in an attempt to get through to the Sacramento Valley and bring help to the rest of the party.

DONNER LAKE  
DISCOVERED

At the time of the dedication of the monument in 1918, one historian recited that:

"So far as any record is preserved, this beautiful body of water (Donner Lake) was discovered by the Elisha Stevens Emigrant Party in November, 1884, and named Mountain Lake, and the first person to tarry there for any length of time was the late Moses Schellenbarger, father of Mrs. Margaret Schellenbarger - McNaught, Commissioner of Elementary Schools of the State of California."

A cabin was built in which Schellenbarger spent the winter of 1844-45. It is recorded that the cabin was left standing and that it was therein that some of the members of the Donner Party took refuge in November, 1846.

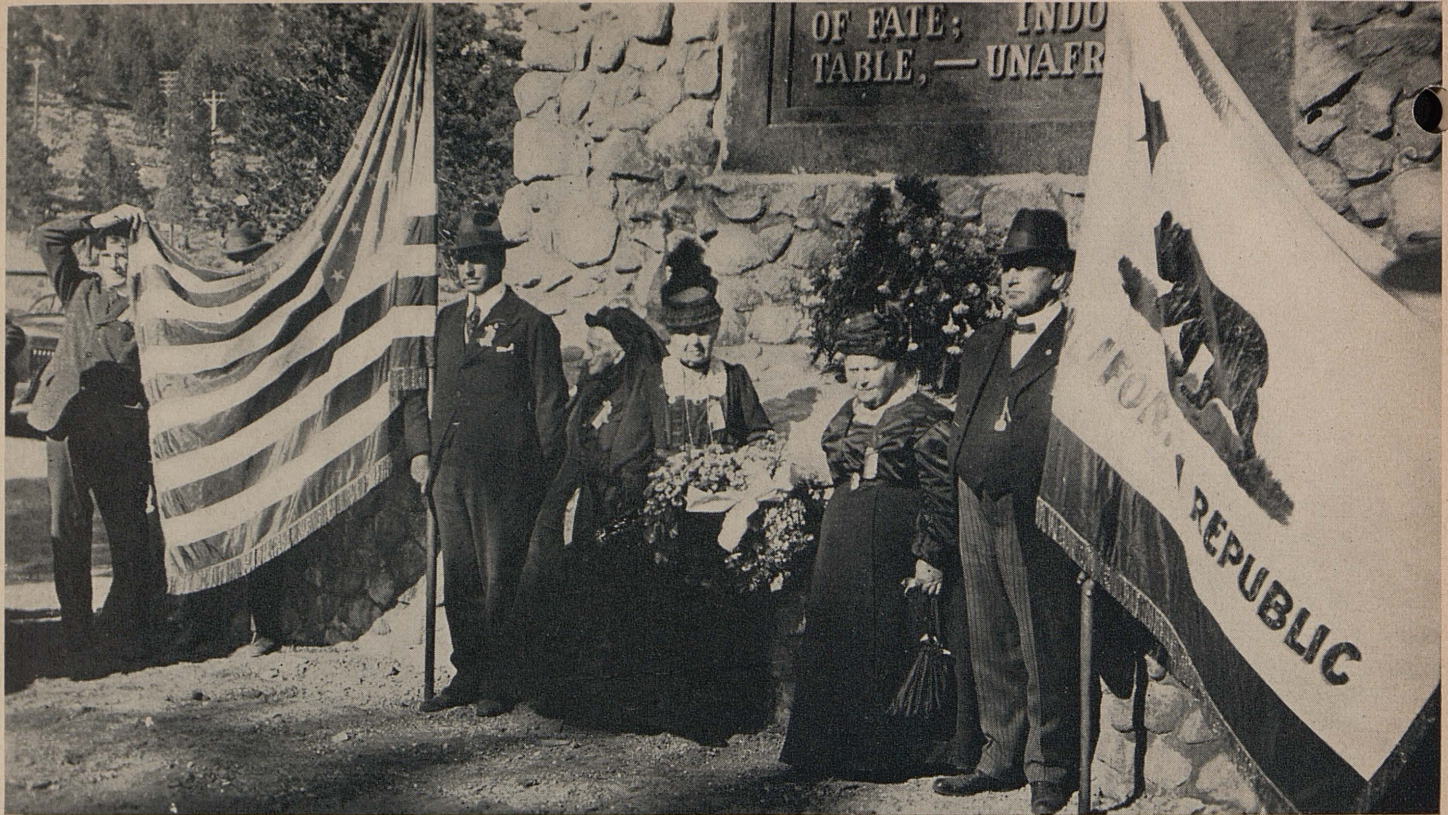
In June, 1847, the Schellenbarger cabin and all of the miserable huts which sheltered the members of the Donner Party, were burned by order of General Kearney, who passed that way with a small detachment.

The tragedy gave its name to Donner Lake and to Donner Pass where the main transcontinental highway, Route No. 40, and the main line of the Southern Pacific Railroad cross the Sierras.



Pioneer (Donner) Monument. The inscription on the plaque reads "VIRILE TO RISK AND FIND: KINDLY WITHAL AND A READY HELP. FACING THE BRUNT OF FATE, INDOMITABLE—UNAFRAID"





Governors of two States attended the dedication of the Pioneer (Donner) Monument June 6, 1918. Left to right—Governor Emmett Boyle of Nevada, Martha Jane (Little Patty) Reed-Lewis, Eliza P. Donner-Houghton, Frances E. Donner-Wilder, Governor William D. Stephens of California

#### START OF EMIGRATION TO CALIFORNIA

Two years before the discovery of gold and while this region was still under the jurisdiction of Mexico, there was heavy emigration to California in 1846. This emigration was stimulated by congressional publication and distribution of 10,000 copies of Fremont's famous topographical reports and maps. The reports described his overland exploration trip to Oregon and California in 1843-44 under the guidance of Kit Carson and other pioneer trappers and guides.

As Mrs. Eliza P. Donner-Houghton states in her book on the "Expedition of the Donner Party": "The commercial world was not slow to appreciate the value of those distant and hitherto unfrequented harbors. Tales of the equable climate and marvelous fertility of the soil spread rapidly and it followed that before the close of 1845, pioneers on the western frontier of our ever expanding republic were preparing to open a major route to the Pacific Coast."

#### 1846 HISTORIC YEAR

Phil Townsend Hanna in his excellent handbook of memorable historical data, "California Through Four Centuries," refers to the years 1846 and

1847 as the period of "Manifest Destiny," and Bernard De Voto calls 1846 "The Year of Decision."

On May 13, 1846, President James K. Polk proclaimed that by the act of the Republic of Mexico, a state of war existed between that government and the United States. The result was the American conquest of California and Texas.

The year 1846 has likewise been designated as "Bear Flag Year" in commemoration of the fact that on June 14th of that year the Bear Flag, standard of "The California Republic," was raised over the Plaza at Sonoma.

No effort will be made in this brief article to trace the course of these historical events. Suffice to say that 1846 marks the start of an era in California, the culmination of which is still undiscernible.

#### STATE HIGHWAY SYSTEM LAUNCHED

**It is fitting, therefore, that we should this year celebrate the centenary of the genesis of this era, as well as commemorate the tragedy of the Donner Party.**

In 1918 all highways across the Sierras, including the Truckee (Don-

ner) Pass Highway, were relative unimproved. They were narrow, single lane in many places, crooked, steep and unholed, although it is true that starting with the last decade of the last century, the California State Legislature had initiated the policy of taking over a number of trans-Sierra highways, declaring them State highways and placing them under the jurisdiction of the State Engineering Department. There were in those days no automobile license fees or gasoline taxes, and funds for improvement or maintenance of State roads were limited to small legislative appropriations made at the biennial sessions.

The first bond act for the improvement of a coordinated State Highway System was voted in 1909 and the first money became available in January, 1912. The work on the system of highways contemplated by the bond act was placed under the direct jurisdiction of a special commission (the California Highway Commission) and a State Highway Engineer, independent of the State Engineer. However, the legislative act State roads continued under the jurisdiction of the State Engineer until 1917, when the Legislature of that year transferred



jurisdiction over all such roads to the State Highway Commission. The road to Lake Tahoe via Donner summit was one of these roads.

Part of the writer's duties with the State Highway Department at that time, included supervision of highway work in that territory, and in connection with this work he was present at the ceremonies at Donner Lake on June 6, 1918, when the monument to the pioneers and the Donner Party was dedicated.

Although the grandson of a "49'er," when in 1894, as a boy, the writer attended the funeral of Pio Pico, aged 95, the last Mexican Governor of California, and gazed on his face as he lay in his coffin, he had little appreciation of the historical significance of that event. The dedication of the Pioneer (Donner) Monument however, aroused an interest in Californiana which has never waned and it was therefore, with keen interest that on June 6, 1918, over 70 years after the tragedy which has become an epic in California, the writer attended the unveiling of the monument at Donner Lake, near Truckee.

Two pictures of Leanna Donner (Mrs. John App) at the age of 83 years, taken at her home near Jamestown, Tuolumne County in October and November, 1918. These photographs taken by the author were the first for which Mrs. App had posed since she was a girl. Concerning the picture on the left, Mrs. App's daughter, Mrs. R. Burrell, wrote to Mr. Stanton: "I am very sorry I did not have mother change her dress. When you come this way again, mother says you can take another picture of her in another dress. Her face is well taken but that dress is killing."



Three survivors of the Donner Party who were present at the dedication of the Donner Monument, left to right—Martha Jane (Little Patty) Reed-Lewis, Mrs. Eliza P. Donner-Houghton, Mrs. Frances E. Donner-Wilder

The unveiling of this monument was the culmination of 10 years of construction by the Native Sons of the Golden West, which was initiated in 1908, but which, although the corner

stone was laid in 1910, was slowed down by World War I which was in its last stages when the monument was finally finished and dedicated.

#### SURVIVORS ATTENDED CEREMONY

Of the eight survivors of the party still alive in 1918, three attended the unveiling; Mrs. Martha Jane (Little Patty) Reed-Lewis of Santa Cruz; Mrs. Eliza P. Donner-Houghton of Los Angeles; and Mrs. Frances E. Donner-Wilder of Byron, the others being prevented from attendance by infirmities incidental to their age.

All survivors of that date have subsequently passed away, the last, Mrs. Margaret Isabella Breen - McMahan died in San Francisco in 1935 at the age of 89. Mrs. Leanna Charity Donner-App was 95 years old when she died in 1930. Mrs. Elitha C. Donner-Wilder and Mrs. Naomi L. Pike-Schenck were over 90.

Pictures taken at the dedication led to some interesting correspondence, particularly with Eliza Donner (Houghton) the youngest of the Donner girls.

Eliza Donner on October 10, 1860, at the age of 17 married S. O. Houghton. Houghton served as a colonel during the Civil War and from 1871 to 1875 as a member of Congress from that part of California extending from San Francisco to Mexico. He is reported as having secured during this period, the first Federal appropriation for the improvement of Los Angeles Harbor.

The family subsequently settled in Los Angeles where Mrs. Houghton was

(Continued on page 32.)



# Improvements in Methods of Asphalt Subsealing of Concrete Pavements

By H. L. COOPER, Assistant Maintenance Engineer

**S**TABILIZING concrete pavement slabs in California by the use of semifluid soil-cement mixtures forced under the slab, using equipment especially designed for the purpose, was first undertaken in 1931 and continued for five years thereafter. At that time the method was used to level up areas where the pavement had settled due to subsidence of the subgrade. This method was commonly referred to as "mud packing."

Nothing further was done in this class of work until 1943 when the practice was again adopted following the failure of concrete pavements at certain locations as a result of the increase in volume and weight of heavy truck traffic. These failures were largely caused by the concentration of traffic from war industries and resulted in a very rapid increase in both the distribution and rate of pumping at the joints in concrete pavements.

Surface water penetrating the cracks and joints saturates the subgrade and heavy traffic causes a pumping action that forces water and subgrade material up through these openings. This pumping action creates a cavity underneath the pavement at the joint and the necessary uniform subgrade support is lost. The pavement then acts as a cantilevered beam at cracks and joints where pumping occurs and breaks down under traffic.

## AIR BLOWN ASPHALT

In 1944 and 1945 a few districts experimented with semi-solid asphalts instead of the soil cement mixtures. Asphalt, when heated to 350 degrees to 400 degrees F., flows like water and spreads more evenly under the pavement than the soil cement mixtures. Air blown asphalt having a penetration of 50-60 and 30-40 was first used, but it was found during the summer months that extrusions of the asphalt occurred from the joints and cracks, causing an unsightly appearance on the pavement. A higher melting point air blown asphalt with a penetration of 20-30 was then tried, and it was found that no more extrusions occurred.



Asphalt subsealing crew of Division of Highways at work

The results were so much more successful than the various types of soil cement mixtures, it was decided to use air blown asphalt this year where this type of work was necessary.

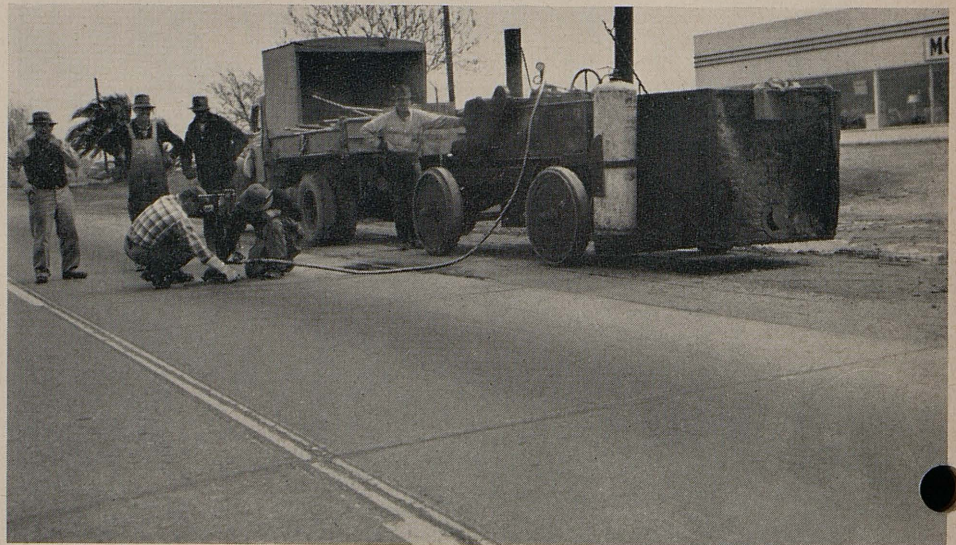
It is thought that one of the principal reasons for the success of asphalt is the fact that it forms a tight seal beneath the pavement and thus prevents the entrance of surface water.

Its stability is not affected by water which may reach it through the subgrade or by percolation through the joints.

## PROGRAMS SET UP

This spring, eight districts have "asphalt subsealing" programs set up in the total amount of about \$100,000. Work was started on a section of the Ridge Route in District VII the early

Asphalt subsealing crew placing nozzle in hole





part of March, and since then all of the other districts have started work.

From a field investigation small portions between the following locations showed pumping and rocking concrete slabs and stepped joints:

District II—North and south of Redding	US	99
Dunsmuir to half mile north	US	99
Weed to Gazelle	US	99
District III—Sacramento to Lincoln	US	99E
Roseville to Newcastle	US	40
District IV—Cloverdale to Petaluma	US	101
Napa to Vallejo	State Sign	29
Petaluma to Ignacio	US	101
San Jose to Redwood City	US	101
San Jose to Gilroy	US	101
San Jose to Milpitas	State Sign	17
Warm Springs to San Leandro	State Rt.	5
Richmond to Pinole	US	40
District V—Cuesta Grade to Santa Maria	US	101
San Luis Obispo Co. Line to San Ardo	US	101
Salinas to Prunedale	US	101
Los Alamos to Las Cruces	US	101
Carpinteria to Ventura Co. Line	US	101
District VI—Lebec to Grapevine	US	99
Fresno to Madera	US	99
District VII—N. City limits Los Angeles to Kern Co.	US	99
Oxnard to Los Angeles Co. Line	US	101
Tustin to Galivan	US	101
Newport Beach to Doheny Park	US	101 Alt.
Seal Beach to Huntington Beach	US	101 Alt.
District X—North of Lodi to Turner Station	US	99
Manteca to Mossdale	US	99
Stockton to Mossdale	US	50
Merced to Madera Co.	US	99
Madera Co. Line to Arena	US	99
Vicinity Rio Vista	State Sign	12
Cordelia—south	State Sign	21
Vallejo to Vacaville	US	40
District XI—Orange Co. Line to Oceanside	US	101
Rose Canyon	US	101
Torrey Pines Grade	US	101

Locations where surface blankets were to be placed this summer were treated first in order to stabilize rocking and pumping slabs and insure a firm base.

#### EQUIPMENT USED

Holes are drilled in the pavement with jackhammers and drills, powered by a portable compressor, usually a day's work ahead of the jacking operations. Some districts drill 1½-inch



Type of expanding nozzle used for asphalt subsealing

holes, while other districts prefer 2¼ inch holes, depending upon the type of asphalt nozzle used. Asphalt heating kettles of varying capacities equipped with pressure pumps, metal hoses, and special nozzles, are used to pump the hot asphalt under the pavement. Some of the kettles are equipped with a reversible pump so that a small amount of asphalt may be sucked out of the hole immediately before removing the nozzle in order to minimize the quantity of asphalt extruding on the pavement. A two-ton truck is used to pull the asphalt kettles and another truck is required to haul the 100-pound asphalt cartons.

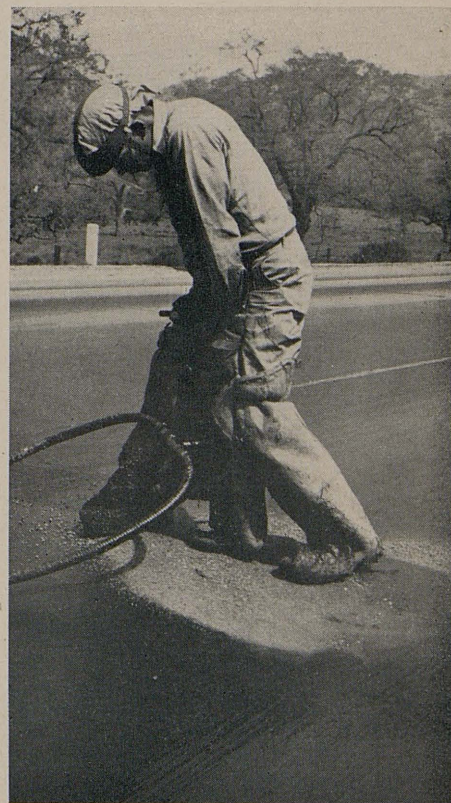
Three men are required in the drill crew, and from six to eight men in the asphalt crew.

#### SEQUENCE OF OPERATION

Previous to asphalt subsealing operations and immediately after a rain, if possible, all pumping and moving slabs are marked with white paint to show the drilling crew the location of slabs to be drilled.

A hole is drilled through the pavement usually located about a foot or 18 inches ahead of the joint in the direction of travel and approximately in

Asphalt subsealing showing two-way valve

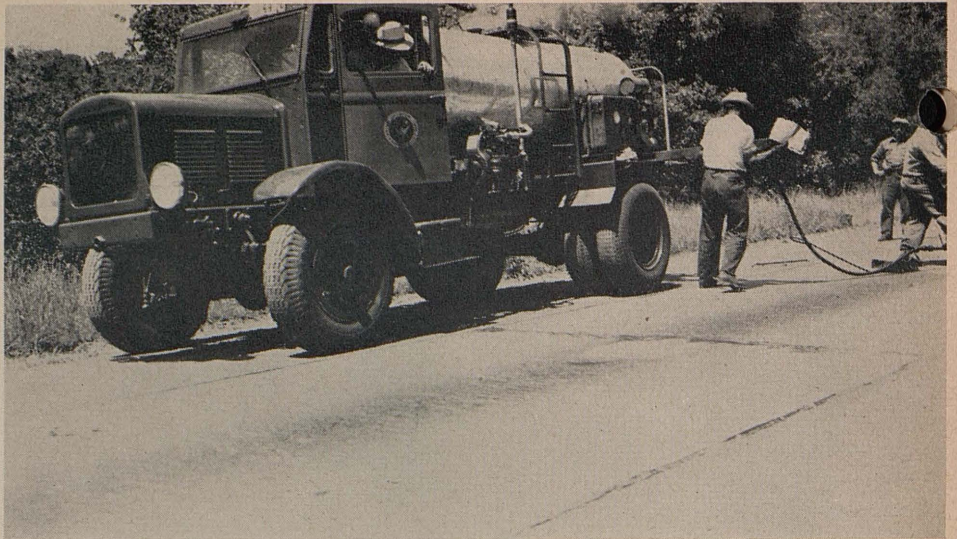


Supplemental or auxiliary nozzle and three-way valve on full circulating system

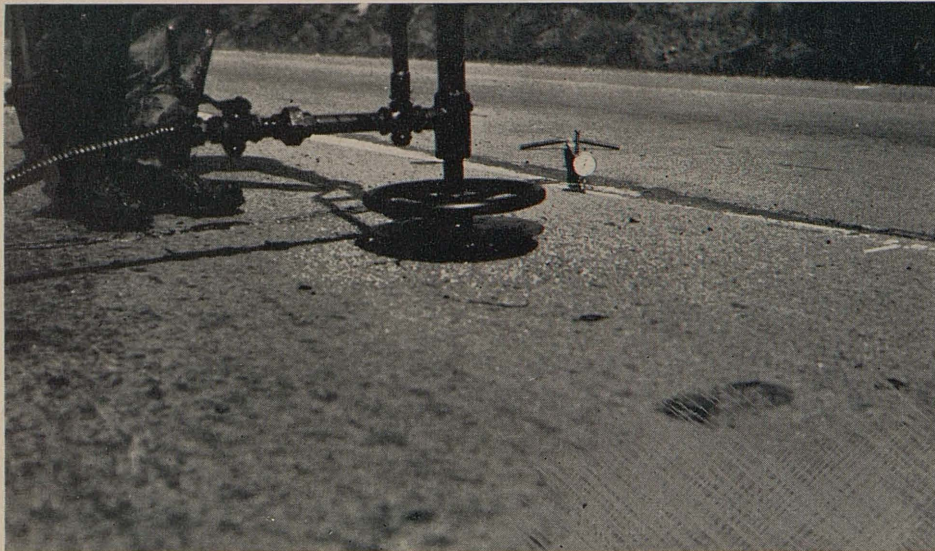


the center of the slab. However, the locations of holes are varied considerably according to the extent of slab cracking and stepped joints, and where experience has shown that the best results may be obtained depending on subgrade conditions. Where free water is encountered in the subgrade at the time of drilling, the holes are blown out with compressed air to remove all water.

The 20-30 penetration asphalt is heated to a temperature of from 325 degrees to 400 degrees F. The injector nozzle which is attached to a 1-inch hose from the asphalt kettle is driven into the hole. A small amount of sand is sprinkled around the hole so that any spillage of asphalt may be easily removed from the pavement.



Asphalt heating tank with 950 gal. capacity built by Headquarters Shop, Div. of Highways



Type of expansion nozzle used in subsealing, showing Ames dial in background

exudes through adjacent cracks or until the slab starts to raise. To determine when the slab first starts to raise, sand was sprinkled along the joints and when the sand started to crawl the flow of asphalt was stopped. This year an Ames dial, graduated to .001 inch, mounted on a frame, is being used to indicate to the nozzle operator when slab movements begin.

#### SAFETY PRECAUTION

Immediately after the nozzle has been withdrawn from the hole, a wooden plug is driven into the hole flush with the pavement, or a wooden stake is driven in temporarily to prevent hot asphalt from extruding. Later on the holes not plugged will be filled with cement grout.

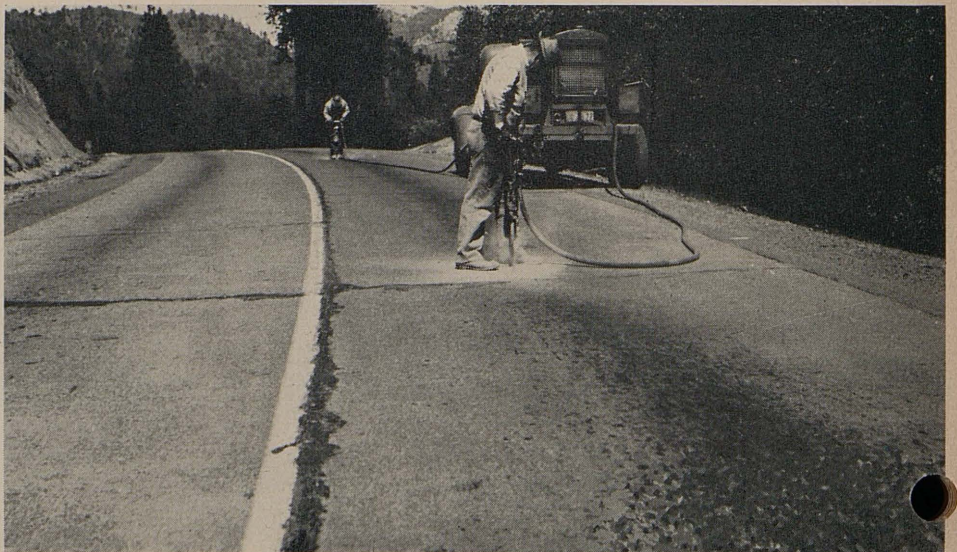
(Continued on page 13)

#### TWO TYPES OF NOZZLES

Two types of nozzles have been developed. District X built an expansion type nozzle using a 2-inch asphalt hose which is expanded by screw pressure, and which completely fills the hole. The other type is a tapered pipe nozzle which is driven into the hole, using paper or burlap as a gasket to secure a tight fit. Both nozzles have proven satisfactory, with the tapered driven nozzle a little easier to handle.

Asphalt pumping is then begun. Pumping pressures of from 20 to 40 pounds per square inch have been found to be entirely adequate in filling the void beneath the slab.

Using this low pressure, a man standing on the nozzle plate will hold the nozzle securely in the hole. The pumping is continued until the asphalt

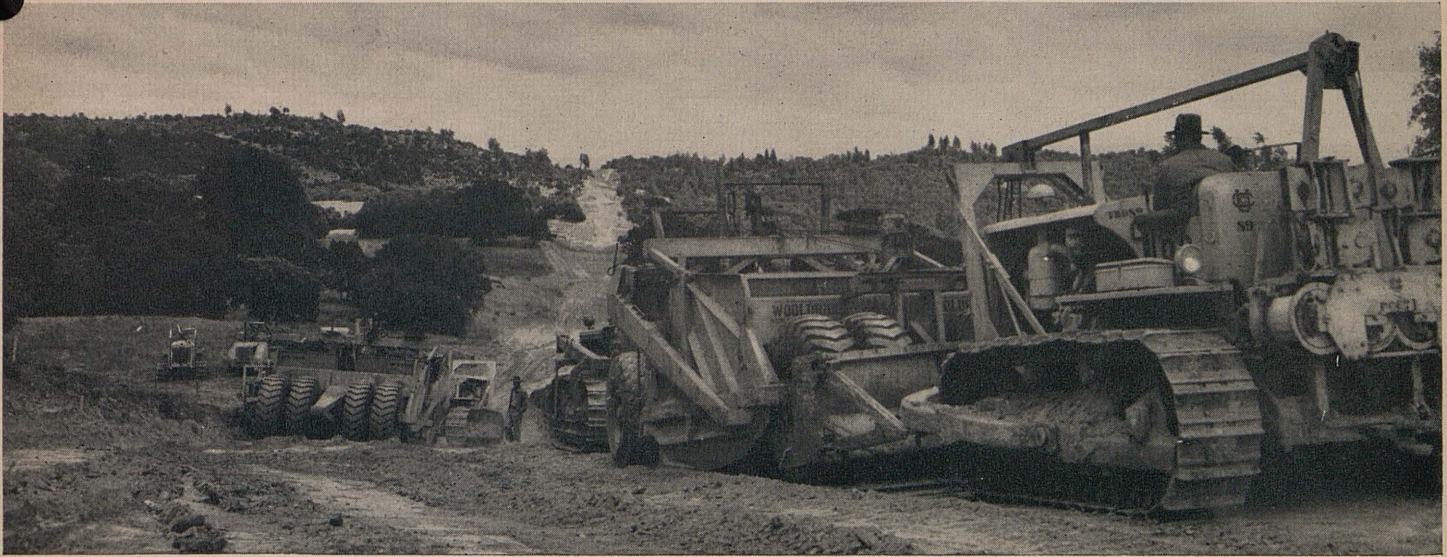


Two hammers drilling holes for asphalt subsealing



# Eliminating 29 Curves between Shingle Springs and El Dorado

(Continued from page 4)



Grading operations one-half mile east of Shingle Springs

The table below gives the comparative statistics for the old and new alignments.

	New alignment	Old alignment	Saving
Number of Curves	6	35	29
Total Central Angle	141° 56½'	1020° 44'	878° 47½'
Minimum radius	1,500'	100'	---
Length of road	3.432 miles	3.832 miles	0.4 miles

The new construction will provide a 22-foot x 0.25-foot plant-mixed surfacing on a 23-foot x 0.42-foot crusher run base. A layer of imported borrow 0.5-foot thick will be used throughout the full length and at various locations where additional cover is required

selected material varying in thickness from 0.5-foot to 1.0-foot will be placed.

The contract allotment for this project, including provision for supplemental work and contingencies, is \$277,253.03. It is expected that work will be completed about Oct. 15, 1946.

This hazardous curve is typical of many on U. S. 50 which will be eliminated by realignment





# HIGHWAY TREE MAINTENANCE

By E. S. WHITAKER, Assistant Highway Landscape Engineer

**D**URING the war years, State highway tree maintenance was restricted by loss of man power, most of which entered the armed forces. The district tree maintenance crews, not including ground forces, were reduced in personnel from 48 to 22 tree foremen and tree trimmers. It accordingly became necessary to restrict the operations of these crews to the performance of only the most necessary work, such as trimming to secure sight distance and clearance of the traveled way, the repairing of trees damaged by storms, the inspection of work performed under encroachment permit, and the maintenance of landscaped areas. It has been only recently in some districts that a crew of sufficient size could be assembled to work on large jobs for general restoration of prewar conditions.

Work of this character is now under way in District VII, north and south

Tree Foreman O. W. Marvel holding the improved saw handle developed by him. Note the spikes on the leaf at the lower center of the photo



Trimming operations under way on U. S. 101 south of Camarillo, Ventura County

of Camarillo in Ventura County where a crew of one tree foreman, three tree trimmers and two groundsmen, with three trucks and drivers for cleanup work, started trimming operations in March on two long rows of *Phoenix canariensis*. Except for minor trimming for clearance, these trees had not been trimmed since 1941 and the great mass of dying and dead leaves, fruiting wood, and spathe hanging down around their trunks was unsightly, as well as restricting clearance to traffic.

Trimming work on this species of tree has offered problems of economic operation as well as hazard to the trimmers. Tree trimmers do not look forward to this work with much enthusiasm, and its high cost per tree includes, usually, time off for one or more men injured by leaf spikes. The lower pinnae of the huge leaves of these trees do not develop fully but form strong, sharp, stiff spikes from 8 inches to 12 inches in length. When trimming is done each year, or at the most every other year, the dying leaves can be cut off before they hang down and the spikes do not offer the same hazard to the trimmer that exists when the leaves are fully declined and it is necessary to work up underneath them for removal.

Tree Foreman O. W. Marvel, in charge of the tree maintenance work in the Ventura area, has devised a method

of suspension for the trimmer during these trimming operations that has

Highway tree trimmer removing leaves from a palm tree and using the improved suspension device developed by Tree Foreman Marvel





greatly decreased the time necessary to trim each tree and reduced the hazard to the trimmer. It has been necessary previously to work from ladders, or from a belt and safety rope around the tree. Work from the ladder was slow, it being often necessary to climb up and down and shift the ladder several times to get around the tree. The trimming from a belt and safety rope is faster than from ladders but still offers obstacles that slow down the work, chief of which is the stubborn and disconcerting tendency of the safety rope to foul up among the old stubs—and always on the opposite side of the tree.

#### NEW DEVICE USED

The three tree trimmers working with Marvel are now using swing boards and waist belts slung from safety knots. Above each safety knot, two adjustable ropes are attached to two iron hooks. The hooks are fashioned in the form of a letter "L" from  $\frac{1}{2}$ -inch round iron. At one end of the shank is an eye 1-inch inside diameter for the rope to be spliced or tied to; the shank is 14 inches by 16 inches in length, the bottom is 8 inches in length and the lip is 3 inches long; both throat angles are 45 degrees. The hook is placed over the upper side of the base of the leaf and between the first spikes and the tree trunk.

The 3-inch lip holds the hook securely in place but does not bind, so that its removal and resetting over another leaf base is an easy operation. A ladder is used to climb within reach of the lower leaves; the trimmer then fastens one hook over the base of a leaf on each side of his body and at about shoulder height and starts cutting. By shifting one hook at a time, he can trim right around the tree, dropping the leaves to one side and outside of the suspension rope. This eliminates the danger of dropping the leaves over the safety rope, as was previously done, and reduces to a minimum the hazard from back or side kick. Once in position, it is not necessary for the trimmer to climb down the tree and up again to another location and as a result, the work is speeded up.

#### IMPROVED SAW HANDLE

Mr. Marvel has also developed an improved type of saw handle that allows for faster cutting and lowers the fatigue factor. On this work, Tanno saw blades with the teeth set to cut on the pull stroke are used. A long handle, rather than a grip handle,

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## Methods of Asphalt Subsealing of Concrete Pavements

(Continued from page 10)



Here is a subsealing crew with equipment

As a safety precaution, the nozzle operator and helper wear gloves, leggings, and plastic masks to prevent being burned with the hot asphalt. To date we have experienced no casualties of any consequence in this operation.

Two or more kettles are used on the work, one kettle being equipped with a pressure hose connected to the gear pump and to a three-way valve at the nozzle. A return line from the three-way valve to the kettle allows circulation of hot asphalt through the hoses and eliminates "freezing." Asphalt is circulated through the lines at all times, except when being pumped under pavement. The other kettles on the job are used for auxiliary heating of the asphalt which is transferred into the pumping kettle as needed.

The "bottleneck" to date on this type of work has been inadequate facilities for heating the asphalt. A well organized crew uses from 800 to 1,100 gallons of asphalt per day. The capacity of the heating kettles varies from 165 to 400 gallons, which necessitates stopping operations to pump asphalt from the auxiliary kettle to the pumping kettle four or five times per day, which results in a total loss in time of at least an hour.

In order to improve this condition, Headquarters Shop is now converting two 1,040-gallon water tanks into oil heating tanks complete with burners, oil pump and pressure hoses. The outfits will be capable of heating cold asphalt to 400 degrees and pumping

directly under the pavement. These two units should materially increase production and reduce costs. Headquarters Shop also has on order several 400-gallon asphalt kettles complete with engines and pumps which will be used later by some of the districts in asphalt jacking.

We have been trying, without success to purchase hot 20-30 penetration asphalt directly from the refineries. At the present time it is only possible to purchase this grade of asphalt in 100 pound cartons.

Experience to date has shown that it is possible to pump some hot asphalt under all types of concrete pavement, the amount of asphalt varying from five gallons to as high as 15 gallons per hole. The average for several districts varies from seven to 11 gallons per hole. The number of holes filled or slabs treated varies in the districts according to the equipment used and the organization of the crew, but averages have been maintained in most of the districts of from 100 to 130 holes per day.

The total cost of this work per day, labor, equipment, and materials, averages from \$260 to \$280, or an average cost of \$2.50 per hole. It is believed that when better equipment is secured and crews become more experienced the cost of this work will be materially reduced.

*Experiments made and results obtained in "Asphalt Subsealing" will be contained in a later article.—Ed.*



# CALIFORNIA MISSIONS

By KENNETH C. ADAMS, Editor

San Rafael Arcangel  
December 14, 1817

WITH the beginning of the nineteenth century the extraordinary number of deaths among Indians at Mission San Francisco de Assisi (Mission Dolores) greatly alarmed the padres at this Franciscan station and their fear of increased mortalities was communicated to Governor Pablo de Sola. While diseases brought to California by Mexican soldiers contributed largely to the death rate of Indians at all the missions, two severe epidemics of measles at Mission Dolores, the last one in 1806, did much to decimate the ranks of the neophytes at this station and on the San Francisco peninsula.

At last Governor Sola suggested that ailing Indians be transferred across the bay to what now is Marin County where a milder climate prevailed. As an experiment, several neophytes were sent over and their health was greatly improved. Fr. Comisario Prefecto Vicente Francisco de Sarrio approved of the idea, but hesitated to permit large numbers of Indians to be moved to the Marin district because communication was difficult and missionaries were lacking.

However, says Fr. Engelhardt, mission historian, after several neophytes on the northern shore had died without receiving the Last Sacrament, Fr. Sarria sought a way out of the dilemma. At this time there was at Mission Purisima Concepcion the learned Fr. Luis Gil y Taboada, who was versed in medical science. Hearing of the situation confronting Fr. Sarria at Dolores, Fr. Luis offered to reside at Dolores as a supernumerary and from there to attend the sick across the bay.

## MISSIONARY HOSPITAL

The offer of Fr. Luis was accepted and this move resulted in the founding, on December 14, 1817, of a missionary ranch in Marin under the patronage of St. Raphael, the Arcangel. Here was erected a chapel and baptismal font and a cemetery was laid out. This was the beginning of Mission San Rafael.

Some 240 neophytes were transferred from Mission Dolores to the health farm and by the end of 1820

## Mission Meccas

California's famous old missions with their historical and romantic background annually attract thousands of visitors. Twenty-one Franciscan missions were founded by the Reverend Fray Junipero Serra and his colleagues, extending from San Diego to Sonoma. On his way north from San Diego, Father Serra and the mission padres who came after him followed a course which became known as **El Camino Real**, "The King's Highway." **El Camino Real** retains to this day its original name and is designated **U. S. 101**. Along this highway and short distances from it, the founding padres established their missions. **U. S. 101**, the old "King's Highway," now extends from the Mexican border into northern Washington.

Present day State highways lead to all the mission sites.

The Division of Highways has published in **California Highways and Public Works** brief histories of the missions with directions on how to reach them over State highways. For the purpose of this series, the missions were taken up in the order of their locations from south to north, rather than in the sequence of their founding.

This is the eleventh and last of the series.

this number had been increased to 590. A composite building, including church, priest's house and all the apartments required was erected in 1818. It was 87 feet long, 42 feet wide and 18 feet high. The corridor was roofed with tules. No serious attempt ever was made to beautify the mission architecturally. It remained a church hospital. It was dedicated to St. Raphael "in order that this most glorious prince, whose name signified the healing of God, might care for the bodies and souls there."

In 1821 rumors came to Governor Sola that some English or American adventurers had established themselves somewhere within 40 or 50 leagues north of San Francisco Bay. He determined to ascertain what truth was in the reports and sent out an expedition of 55 leather-jacketed soldiers and infantrymen under Captain Luis Arguello. Fr. Blas Ordaz accompanied the party as chaplain and chronicler.

## EXPEDITION GOES NORTH

Fr. Engelhardt gives an interesting summarized account of the wanderings of the expedition which Historian Bancroft believes went as far north as Shasta, or Weaverville in Trinity County, and then struggled back through the mountains by way of Ukiah, Cloverdale, Healdsburg, Santa Rosa, and Petaluma to Mission San Rafael. Says Fr. Engelhardt:

"The whole company, joined by some Ululatos and Canucaymos Indians, who wished to visit their pagan relatives, set sail in the two launches of the presidio and the mission about 11 o'clock on the morning of Thursday, October 18, 1821, and landed near the estero of San Rafael, at Ruyuta, in the vicinity of what is now Point San Pedro, where they passed the night. Next day they continued the voyage to Carquinez Strait where they were joined by two other boats. On Saturday the horses were ferried across the stream. On Sunday, the 21st, Fr. Ordaz celebrated Holy Mass, whereupon the troops and Indians passed over to the other side.

"The march north began on Monday and continued to October 30th up the valley of the Sacramento, which the Spaniards called Jesus Maria. Unfortunately, Fr. Blas gives no distances nor latitudes, so that it is impossible to locate the different Indian villages and camping places. The natives in but a few cases showed hostility, but the booming of the canon would disperse them. Only in one case Sergeant Amador, despite Arguello's orders, aimed low and killed seven of the aggressors. The most serious mishap to the soldiers was the loss of a mule that fell into the river with 2,000 cartridges on its back. Until the 30th





Nothing now remains of Mission San Rafael Archangel depicted here in a wash drawing by H. Chapman Ford

Fr. Blas found little difficulty in conversing with the Indians, but from that date the Spaniards had to content themselves with the sign language.

#### WEARY MARCHERS RETURN

“On October 31st, the expedition departed from its northward course and turned to the west, according to Fr. Ordaz, until it came to the foot of a mountain range 15 leagues from the Sierra Nevada, which range extended from north to south and terminated in the region of Bodega, then in possession of the Russians. An Indian attack at night was repulsed by the explosion of a grenade. Next day after Holy Mass the return march was begun and continued southward over the mountains for nine days. No distances are given, so it is impossible to trace the route; but the explorers experienced great difficulties. Many horses died, and four pack mules fell down a precipice. On November 10th they found the body of a neophyte from San Rafael who had been killed by savages. After Christian burial had been accorded, the weary wanderers arrived at a spring which they

named San Jorge. Next day, Sunday, Fr. Blas celebrated Holy Mass for the last time on the journey, as at about 6 p.m. they reached Olompali, six leagues from San Rafael. Worn out, and the rations nearly exhausted, the explorers arrived at San Rafael towards noon of the 12th. Here Fr. Blas next morning sang a High Mass in thanksgiving. In the forenoon of the 15th all had again returned to the presidio of San Francisco.”

In 1821, the imperial commissioner, Rev. Agustin Fernandez de San Vincente decided to visit the Russian settlement at Fort Ross to gather information for his government. Fr. Commissary Prefect Mariano Payeras accompanied him. They left Monterey on October 11th, arrived at the presidio of San Francisco on the 18th and the following day, with a detail of soldiers, set out for Mission San Rafael, reaching there in the afternoon. On Sunday, October 20th, Fr. Payeras celebrated Holy Mass in honor of the patron San Rafael. Arriving at Fort Ross, they were received by Captain Carlos Schmidt and remained there two days. They returned to Mission San Rafael on October 26th. Fr.

Payeras drafted a lengthy report describing Fort Ross and its settlement.

In April, 1823, Fr. Payeras died at Mission Purisima Concepcion and Fr. Jose Senan became presidente of the missions. He survived Fr. Payeras only four months, passing away in August, and Fr. Vicente de Sarria succeeded him.

One of the first matters to engage Fr. Sarria's attention was the unauthorized attempt of Fr. Jose Altimira of Mission Dolores to abandon the San Francisco station and Mission San Rafael and establish a new mission in Sonoma County. In this move, Fr. Altimira had the support of Governor Arguello. As we know, Fr. Sarria blocked the plan, but, nevertheless, permitted the Mission San Francisco Solano to be continued after its irregular founding by Fr. Altimira. The story of this intrigue properly belongs in the chapter dealing with Mission San Francisco Solano.

In 1824, an Indian named Pomponio, an outlaw who for several years had robbed and murdered Indians from San Rafael to Santa Cruz, was captured by Lieutenant Martinez near Mission San Rafael after he had killed



a soldier. He was sent to Monterey, tried and shot in September.

#### STORMY PERIOD

A stormy period in the history of Mission San Rafael is dealt with by George Wharton James, who wrote:

"When the northern Missions were placed under the padres from Zacatecas, Padre Mercado was sent to San Rafael. He was a self-opinionated man, who soon got into trouble with Commandante Vallejo of San Francisco. He demanded the surrender of a neophyte whom the guard had arrested in accordance with Vallejo's orders; and when the corporal of the guard asked for meat for his men, Mercado insultingly told him 'he did not furnish meat to feed wolves.' The corporal caused a sheep to be killed, and this rendered Mercado furious.

"A few months later a band of gentle Indians came to San Rafael, and during the night a robbery was committed. The padre accused 15 of the strangers of the theft, arrested them, and sent them to San Francisco. Fearful lest the whole band should then come down upon him for vengeance, he armed his neophytes and sent them out under the command of his majordomo to surprise the gentiles. The movement was a success from his standpoint, as 21 were killed, as many more wounded and 20 made captives, some of these latter being women and children. When the matter was reported to Governor Figueroa he was exceedingly indignant, especially as the padre asked for reinforcements to 'pacify' the rancherias. Mercado was suspended by his prefect, pending an investigation, while Vallejo, releasing the prisoners sent to San Francisco, also freed those in bonds at San Rafael, and then went among the rancherias, explaining the matter and doing his best to quiet the angry feelings aroused. In the middle of the following year Mercado was released and returned to San Rafael, two friars, who had been sent to report upon the matter, claiming he had nothing to do with the attack."

#### MISSION IS SOLD

On November 4, 1834, Governor Figueroa issued his decree secularizing the California Missions. San Rafael was designated as a curacy of the first class. Ignacio Martinez was named commissioner in charge. An inventory placed a value of \$18,474 upon the mission buildings, church, ornaments and livestock. Debts were listed to the amount of \$3,488, leaving a balance of



This church now stands on the original site of Mission San Rafael in the City of San Rafael

\$15,025. In December, 1,291 sheep and 439 horses were distributed among 343 mission Indians.

Old mission records show that in 1832 the station had 2,120 cattle; that it had its largest flock of sheep, 4,000 head, in 1822; its largest herd of horses, 454, in 1825, and that its largest wheat crop was in 1822 when 2,458 bushels were harvested.

In 1845, Governor Pio Pico had an inventory taken at San Rafael and the valuation of the mission and property was fixed at \$17,000. The following year he sold the mission to Antonio Sunol and A. M. Pico for \$8,000. The purchasers did not obtain possession. American occupation came and Mission San Rafael some years later was returned to the church by order of the President of the United States.

In June, 1846, John C. Fremont marched to meet a force of Mexicans believed to be at San Rafael. He did not encounter the enemy. On June 26th he took possession of the mission and remained there about a week. When he left he took a number of cattle and horses, went to Sonoma and on July 5th took active command of the conquest of California.

After Fremont's departure the mission fell into rapid decay.

From 1817 to 1845 there were no other habitations in San Rafael aside from the mission. In the latter year, Don Timoteo Murchy built the first house in San Rafael and later Jacob and J. O. B. Short erected the second structure. In 1854, a band of squatters seized the mission land, but were evicted by the government. In 1869 a



Catholic church was built on the old mission side. The altar space occupied the same position as did the altar of the mission. This church burned down and a new one was built in 1917. It stands on the old mission site at the head of "A" Street on Fifth in San Rafael. Adjoining is a parochial school. The only thing remaining of

Mission San Rafael is an ancient pear tree. It is protected by a cement coping.

Motorists entering San Rafael from the north over U. S. Highway 101 who desire to visit the mission site will turn into the business district via Fourth Street and drive up Fourth to "A" Street where a Mission

Bell sign will direct them one block north to the site.

Visitors coming from San Francisco will follow U. S. 101 into the city, turn west on Fourth Street to "A" Street and go one block north to Fifth Street, where is the mission site. Or the route may be west on Fifth Street to "A" Street.



From Original Etching by H. Chapman Ford

Mission San Francisco Solano as it looked during its occupancy by the Padres

## San Francisco Solano July 4, 1823

We come now to the end of "The Trail of the Padres."

Fifty-four years after Fr. Junipero Serra founded Mission San Diego de Alcalá with visions of a chain of Franciscan stations stretching from San Diego to San Francisco, the Mission San Francisco Solano was established in what now is Sonoma County on July 4, 1823. It was the twenty-first and last of the California missions.

Because Fr. Jose Altimira, then at Mission Dolores, proceeded to found San Francisco Solano without the consent of his superiors it was nine months before the mission church was dedicated and the station officially began to function.

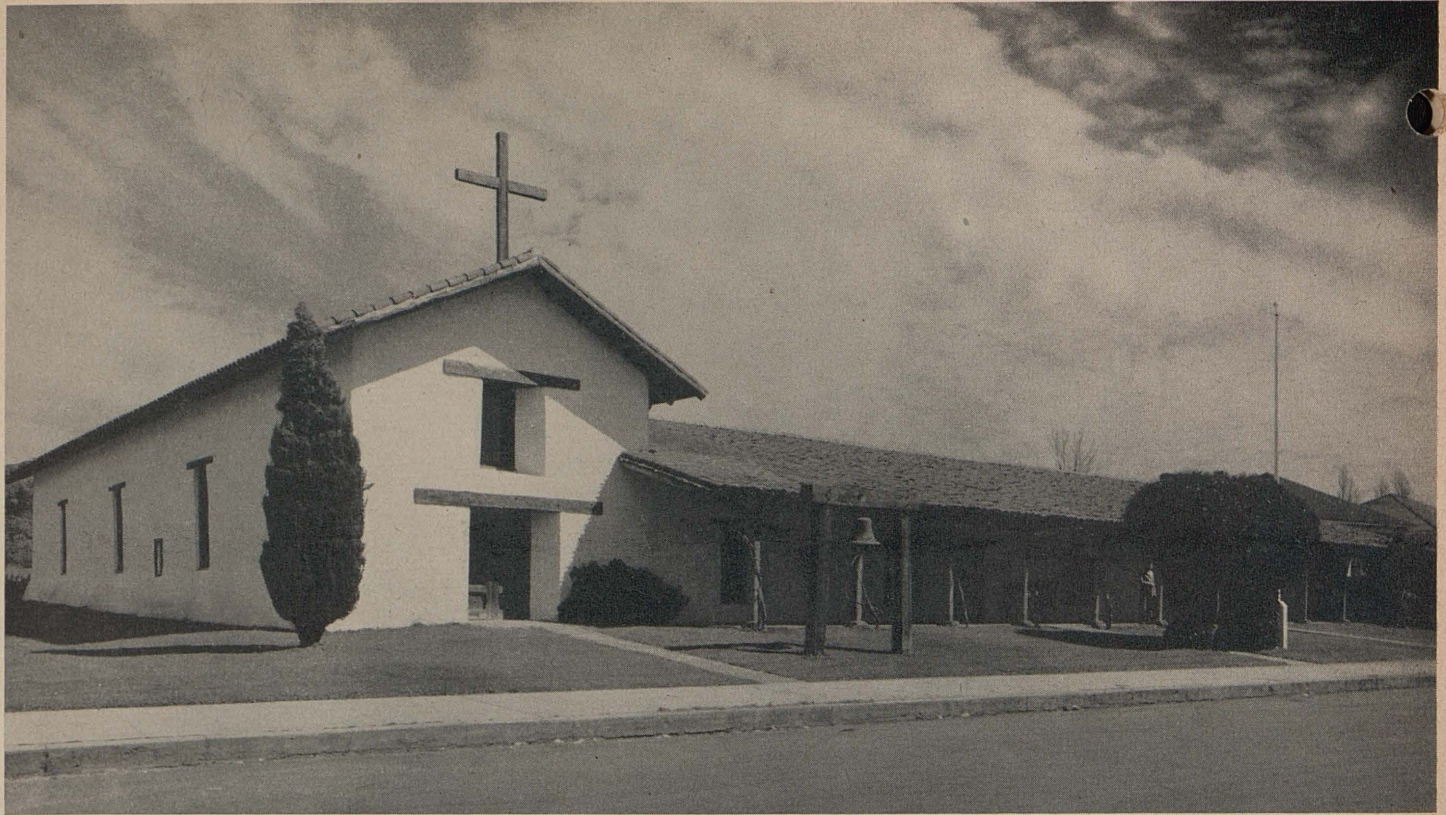
Fr. Jose Senan had succeeded Fr. Payeras as Presidente of the California Missions but, as we have seen, lived with his new honors only a few months and upon his death Fr. Vicente de Sarria became Presidente. The story of the irregular founding of Mission San Francisco Solano is best told by Fr. Engelhardt, mission historian, who wrote:

### UNAUTHORIZED FOUNDING

"The first important matter which engaged the attention of Fr. Sarria was the unauthorized founding of a new mission in the north and the attempted suppression of the missions of San Francisco and San Rafael. The sterility of the soil, the severity of the climate, and the prospect of numerous conversions, appealed to Fr. Jose Altimira, a newcomer stationed at San

Francisco, as sufficient reasons for removing his neophytes to a locality north of San Rafael. He found a sympathetic supporter of the plan in Governor Arguello, who until lately had been commander of the presidio on the bay. The proposition had been argued before Comisionado Fernandez and Fr. Prefecto M. Payeras during their visit in October, 1822. Fr. Altimira claimed that on this occasion Fr. Payeras had given his consent, and entrusted the petitioner, Fr. Altimira, with the transfer of the mission and the choice of a new site. This is scarcely possible, because the question could not be decided one way or the other without the approbation of the College of San Fernando. Nor would the late Fr. Comisario have determined the question without consulting the Fr. Presidente, because the other mis-





In its restored condition, Mission San Francisco Solano retains the architectural lines of the original establishment

sions usually had to contribute livestock, implements, and other goods. Certain it is, that the inexperienced and somewhat conceited young friar, at the instigation of Governor Arguello, Bancroft thinks, on March 23, 1823, drew up a memorial urging the transfer of Mission San Francisco. It was presented to the first Territorial Legislature at Monterey in April.

#### LEGISLATIVE ACTION

"The diputacion of legislative assembly of six men, who really had nothing to do with the matter, on April 9th not only voted in favor of the change, but decreed that the mission station of San Rafael should also be removed and with Mission San Francisco located on a new site in the country of the Petalumas or of the Canicamos, in other words, that both should be suppressed and a new mission started. The diputacion went further, and proposed the suppression of the missions of Santa Cruz and San Carlos, but failed to agree. These measures were all beyond the province of the half dozen men who composed the assembly; for the missions were ecclesiastical institutions, under governmental protection, it is true, but not governmental establishments. At

any rate, as Fr. Sarria remarked, the decrees had no binding force until approved by the Mexican Government, to which Arguello referred them next day.

"When Fr. Amoros of San Rafael heard of the resolution to suppress his post, where he was feeding, clothing, and instructing 800 Indian converts, he, on May 17th, sent a protest to Governor Arguello against the transfer which he declared unreasonable and unjust, in that the late Fr. Comisario-Prefecto, during his visit on October 19, 1822, had decreed that San Rafael in everything should be independent of Mission San Francisco. Nevertheless, without waiting for the approval of the Fr. Presidente, now that Fr. Payeras had passed away, Fr. Altimira with Francisco Castro, one of the six deputies, and 19 men under Ensign Jose Sanchez, embarked on June 25th for the purpose of establishing the proposed mission. They spent the night at San Rafael, and next day set out to explore the country for a favorable site.

"They went by way of Olompali, examined the valleys of Petaluma, Sonoma, Napa, and Suisun, and finally on July 3d returned to Sonoma. Here they determined to locate the new es-

tablishment, because they thought the place best adapted by reason of climate, abundance of timber, stone, and water. Fr. Altimira next morning raised and blessed the cross and site, celebrated Holy Mass, and thus on July 4th, albeit illegally, laid the foundation for the new Mission of San Francisco. 'All the people were told,' he writes highly elated to Fr. Senan, 'that in future this place would be called New San Francisco.' The expedition then returned to Mission Dolores where on July 16th the friar dated his diary and report.

#### FR. PRESIDENTE AMAZED

"The Presidente was amazed at the summary and illegal manner in which the legislative assembly had disposed of the subject of mission founding and mission suppression without consulting the Supreme Government in Mexico. He wrote to Fr. Sarria, he was fairly astounded at the audacity of Fr. Altimira. While he lay dying at San Buenaventura, Fr. Senan on August 14th dictated to Fr. Blas Ordaz a long letter full of minute instructions for Fr. Sarria. The document may be called his testament, for he died a few days later. Concerning the transfer of Mission San Francisco, on account of



the roughness of the climate, he said that he was not averse to it, but that he considered the manner as striking at authority. For the rest he directed Fr. Sarría to do what he thought proper.

"After consulting with Fr. Estevan Tapis and Narciso Duran at San Juan Bautista, Fr. Vicente de Sarría accordingly wrote to Fr. Altimira as follows: 'I have learned with regret what Your Reverence has done in attempting to found the new Mission of San Francisco. By order of the Rev. Fr. Presidente Jose Senan, who is now so grievously ill that he is incapacitated to govern the missions, I shall have to act in his place in accordance with his circular which has made the rounds of the missions. Nevertheless, I have not wished to take any steps until the subject was discussed in keeping with our regulations. For this purpose various Fathers and myself have assembled today at this mission. According to their judgment as well as mine, I have to say that Your Reverence is not lawfully authorized to undertake said founding of a mission, and that consequently you expose the spiritual functions of your ministry to nullification, because the faculties which we have are in locis a suis superioribus assignatis (for places assigned by their superiors). Such is the declaration of the Bull of Pius V on this point.

"Your reverence can not defend your action with the alleged will of the Rev. Fr. Prefecto, God rest his soul, which did not touch the present transaction of designating time and place, nor did it extend to the topographical site of the founding, or the sending of Your Reverence to such a distance without an associate contrary to canonical and civil laws and in opposition to the statutes of our Apostolic College. I do not know that there is among the Fathers one who approves of your way of proceeding. It will cause much grief at your college when it is informed about the matter. My dear Father, no one perhaps will surpass me in zeal for extending the glory of the Holy Name of the Lord by means of the light of His Holy Gospel; but Your Reverence knows that this zeal must be according to wisdom. If it must be against charity and its sweet fruit—peace, then let us put it aside or at least postpone it, the former for the sake of the latter which is more necessary.'

Meanwhile, at the end of July, Arguello asked Fr. Altimira why he had not effected the transfer of Mis-



Old mission bell hangs at entrance to Sonoma Mission, now a State museum

sion Dolores. He was told that it was impossible to begin operations without the neophytes of San Rafael, because the number of those at Mission San Francisco was not half sufficient. Fr. Altimira also went to Monterey, hardly with the permission of his prelate, to consult with the Governor. Arguello directed him not to await the Superior's orders, but to make a beginning at once.

"On August 4th, Arguello also sent communications of similar import to Fr. Presidente Senan, to Fr. Amoros of San Rafael, and to the commandante of the presidio of San Francisco. Strange to relate, Fr. Altimira on August 12th accompanied Lieutenant Ignacio Martinez across the bay, took possession of the mission property by inventory, and returned to Mission Dolores. On the 23d he started out for

Sonoma with an escort of 12 men, who carried 500 cartridges, and artilleryman who was to manage a cannon of two-pound calibre, and a force of neophyte laborers. They arrived at New San Francisco on the 25th of August, and at once began work on a granary, irrigating ditch, corral, and other necessary structures. Good progress was made for a week, when on August 31st Fr. Sarría's letter just quoted changed the situation.

"Bancroft describes Fr. Altimira's state of mind after the receipt of Fr. Sarría's letter as 'furious.' The terms and tone of a long, wild communication which the self-willed young friar addressed to Governor Arguello on the same day justifies the word. Recounting what had occurred, and that he was obliged to interrupt the work, he complained most bitterly of the way in

(Continued on page 29)



# Napa County and State Celebrate Progress on Rector Canyon Dam

**H**EAVY construction work on Rector Canyon Dam in Napa County was inspected on Saturday afternoon, May 11th, by Governor Earl Warren, State, Federal, and county officials and members of the Legislature who made the project possible. They participated in ceremonies celebrating the start of placing the fill in the dam.

Rector Dam, which will cost \$1,350,000, will provide water for four State institutions in the Napa Valley—the Veterans Home at Yountville, Napa

State Hospital, the State Farm, and the State Game Farm.

Governor Warren and his official party, including C. H. Purcell, Director of Public Works; A. H. Henderson, Assistant Director; State Engineer Edward Hyatt, A. D. Edmondston, Assistant State Engineer, and James S. Dean, Director of Finance, arrived at Rector Dam at noon and with other notables were guests of honor at a luncheon served in the farm labor camp mess hall near the dam site.

Present and past directors of the Veterans' Home, regional officers of

the Veterans Federal Administration and officers of major veterans organizations were among some 250 invited guests who heard Governor Warren pay high tribute to Col. Nelson I. Holderman, for the past 20 years Commandant at Yountville.

In a brief luncheon address, the Governor declared that Rector Canyon Dam will make it possible to develop the Veterans' Home into "the most beautiful and finest in the United States" with an eventual capacity of three times the 1,200 veterans it can now accommodate and will likewise

Heavy construction equipment is excavating tons of material on site of Rector Canyon Dam, Napa County







Participating in celebration at Rector Canyon Dam were, left to right, Col. Nelson I. Holderman, Commandant at Yountville Veterans' Home; Owen Duffy, Superintendent of Napa State Farm; Governor Earl Warren; James S. Dean, Director of Finance, and C. H. Purcell, Director of Public Works

Give the Napa State Hospital with sufficient water for its expansion from 3,000 to 7,000 capacity.

"There is one man," the Governor said, "who is entitled to the lion's share of credit for everything that has been done to improve and expand the veterans home in the past 20 years. That man is our beloved Commandant, Col. Holderman. He has had the courage and perseverance to stay with the job against heavy discouragements until, at last, he can see the light of day and success for his efforts. A man of less courage would have become disheartened and given up long ago."

Taking part in the ceremonies were the directors of the Veterans' Home, Percy King of Napa, George A. Marshall of Vallejo, Reed Robinson and Jean Bercut of San Francisco, Matthew Beaton of Monterey, Robert Mitchell of Los Angeles, and Joseph S. Long of Riverside, whose administrative control of the institution passed on May 21st to the new California Veterans' Board.

At the luncheon Thomas Maxwell, Chairman of the Napa County Board of Supervisors, introduced his fellow members of the Board, Ralph Minna-

hen, Lowell Edington, Charles Tamagni, and N. D. Clark.

Others who spoke briefly were Assemblyman Ernest C. Crowley of Fairfield and State Senator Frank L. Gordon of Suisun, who represent Napa in the State Legislature and who led the fight there for the Rector Canyon project; George G. Radcliffe of Sacramento, one-time Chairman of the State Board of Control; Lawrence C. Stevens of Long Beach, newly appointed Director of the California State Veterans Board; State Director of Finance Dean, State Director of Public Works Purcell, State Engineer Edward Hyatt, and Robert Mitchell, Chairman of the Buildings and Grounds Committee of the Veterans' Home Board of Directors. President Marshall of the Veterans' Home Board of Directors acted as master of ceremonies.

Finance Director Dean credited Governor Warren with main responsibility for "the greatest program of public works in the history of the State." Public Works Director Purcell said time would demonstrate that both the Conn Valley and Rector Canyon Dams will be needed in the Napa area.

## TREE MAINTENANCE

(Continued from page 13)

is advisable so that the last few cutting strokes can be made with the hand and forearm out of the way of spikes on the falling leaves. The long handle places the cutting hand in a position of greater continued strain than is had from a grip handle and Marvel has fashioned handles with finger grooves so that a better purchase is secured than the former smooth handle provided. The length of the handle remains the same to secure the desirable safety in distance factor.

The large scale tree reconditioning and replanting programs planned for the near future, made necessary by the reduced program of operations since 1941, will doubtlessly afford other opportunities for improvements of working conditions and for increased production at lower costs. It is through such developments in methods of operation and improvements of equipment that working conditions can be made safer and maintenance costs reduced.

## NOISIEST DRIVERS

The noisiest drivers in the world are not to be found in Sunday traffic tangles in America, but in China—particularly on the mountainous stretches of such highways as the Ledo Road.

Chinese truck drivers just can't be kept from tooting electric horns far too long for the good of the generating batteries. So, at the request of the Chinese Government, manufacturers are installing hand-operated horns on trucks to be shipped to China.

Dr. Theo K. Miller, Superintendent of Napa State Hospital; Owen Duffy, Superintendent of the State Farm, and C. K. Van Ornum, Superintendent of the State Game Farm, were seated at the Governor's table. They were members of the committee which arranged the celebration.

After the dinner and speeches, Governor Warren led a motor procession to Rector Canyon for an inspection of the dam site and the excavation work in progress there.

Governor Warren spent seven hours in Napa County, visiting the State Farm and State Game Farm and remaining for a farewell supper at the Veterans' Home for members of the home board of directors.



# INCREASING COAST HIGHWAY CAPACITY

By EARL E. SORENSON, District Construction Engineer

THE unprecedented increase in population of the San Diego metropolitan area, due to defense activities as well as natural growth, and also the establishment of Camp Joseph H. Pendleton, the largest Marine base in the country, has severely taxed what is popularly known as "El Camino Real," State Route 2 (U.S. 101), the main coast highway, particularly from Oceanside north.

This section of highway, which was reconstructed or realigned throughout its entire length prior to 1937, has been carrying an increasing amount of traffic until the steadily mounting congestion and resultant accident rate, make the reconstruction of those portions not already four-lanes in width, an immediate necessity.

The sections under present contract extend from the San Luis Rey Bridge at Oceanside, to Aliso Creek, with a short exception over the Santa Margarita River; and from the old Las Flores Underpass to the San Diego-Orange County Line, with a short exception over the Santa Fe tracks at San Onofre.

The above exceptions, and the portion between Aliso Creek and the old Las Flores Underpass, have already been constructed to a four-lane width.

## CONTRACTS AWARDED

The work was advertised in four separate units:

N. M. Ball Sons of Los Angeles were awarded the contract for the portion from one mile north of Las Flores to San Clemente. The final total cost of this work will be approximately \$685,124.58.

Fred D. Kyle Company of Pasadena was awarded the contract for construction of the Oceanside Grade Separation structure. The final cost will approximate \$100,000.

Basich Brothers Construction Company of Alhambra was awarded the contract for that portion of the highway from the San Luis Rey Bridge to Aliso Creek. The cost of this section will approximate \$616,643.58.

A contract for the construction of a new bridge across San Mateo Creek was awarded to Oberg Brothers of Inglewood, at an estimated expenditure of \$161,533.70.

The total cost of the improvement, over the entire section, will be approximately \$1,563,321.86.

## TYPE OF CONSTRUCTION

Traffic is being handled through the work and over an old paved State highway on the east side of the Santa Fe tracks between the old Las Flores Underpass and the San Onofre Grade Separation.

The Portland cement concrete pavement is of uniform eight-inch depth, using no expansion joints, and with crack controlling weakened plane joints at 15-foot intervals. The slabs are tied longitudinally by bolts with threaded sleeve connections.

The material for the Portland cement concrete and the asphaltic concrete for the Basich Brothers contract is being supplied by the Lawrence Canyon Rock Company at Oceanside.

N. M. Ball Sons have erected their own plant in San Mateo Creek for crushing and screening rock.

Aggregate for the bridge contracts is being supplied from the same sources.

The most modern excavation and paving equipment is being used with favorable results and progress.

## INTERESTING INNOVATIONS

Several very interesting innovations and experiments are being carried forward on this job.

A machine, constructed by Hurst Lewis of Los Angeles, having rotary disc cutters faced with diamond chips, was used to cut weakened plane joints at the regular 15-foot intervals, over a 1,500-foot length of Portland cement concrete pavement on the N. M. Ball Sons contract. Joints on 500-foot lengths were cut at 24-, 48-, and 72-hour intervals after pouring.

A careful check is being made to determine the relation between the time of cutting and control of the cracking. Results will be observed and data kept for several months, after which it will be evaluated and made available for future reference.

The cutting machine is an ingenious device, mounted on a two-axle, six-tired chassis which travels and steers longitudinally with the pavement. The cutting beam is mounted transversely

and controlled hydraulically. The beam carries six disc cutters, and cuts a joint 12-feet in length and 1½ inches deep and approximately ⅜-inch wide, in an average time of two minutes. The high speed at which the disc cutters revolve necessitate their cooling by a stream of water flowing over them. The entire device is handled by one operator, who controls the mechanism from a platform mounted above the transverse beam, to give him good visibility. Motive power is supplied by a four-cylinder gasoline motor. A small hand machine was also tried out, with satisfactory results.

## NEW TECHNIQUES

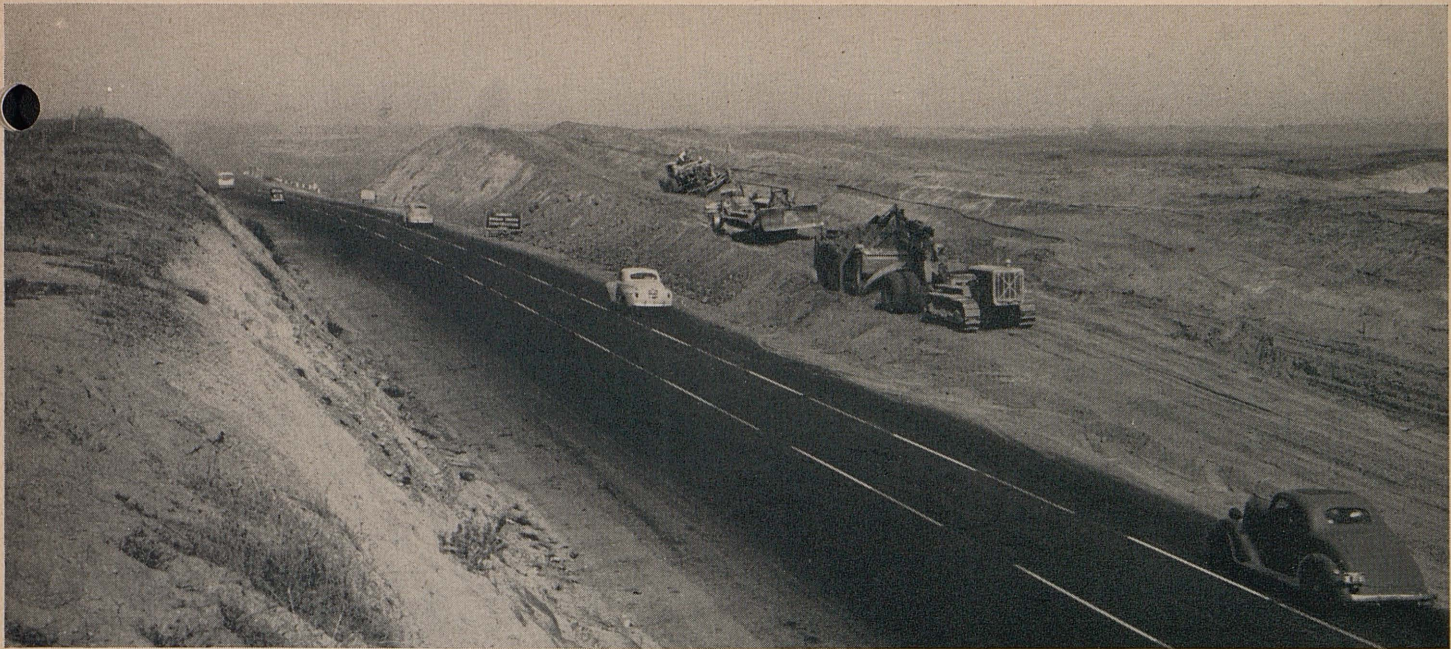
A cement stabilized base course will support the Portland cement concrete pavement on the Basich Brothers contract. The material for this course will be mixed through a Barber-Greene mixer, set up at the imported borrow pit as a central mixing plant, and will be laid by conventional and familiar methods developed on previous jobs.

The cement treated base on the N. M. Ball Sons contract was constructed by blending Portland cement with material already in place on the roadbed, and involved new techniques. The material to be treated was pulverized, windrowed, and sized, after which the required cement content was dumped by a special cement distributor equipped with a metering device. It was then thoroughly mixed dry, with a conventional Gardner mixer. Water was then metered and injected through the same mixer. The mixed material was spread by a special spreader constructed on the job, rolled with a three-wheel roller, cut to accurate cross section with a Lewis sub-grade cutter and finished with a rubber tired roller. It was cured by the application of an impervious membrane of emulsified asphalt.

## AN EXPERIMENT

The placing of stabilized base by this method being new, and untried, it was of considerable interest to all concerned, and the Sacramento laboratory assigned a representative to the job to assist and to obtain data for future reference.





Start of grading operations between San Luis Rey bridge and Aliso Creek on U. S. 101

It was generally conceded that the last cutting operation on the stabilized base, to "true" up the grade to receive concrete pavement, should be eliminated, as it resulted in detrimental disturbances of the compacted surface.

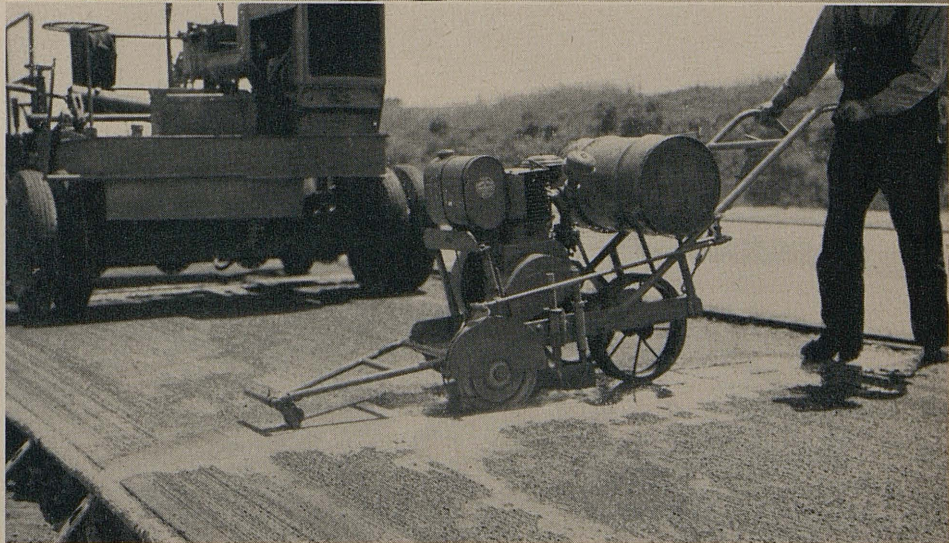
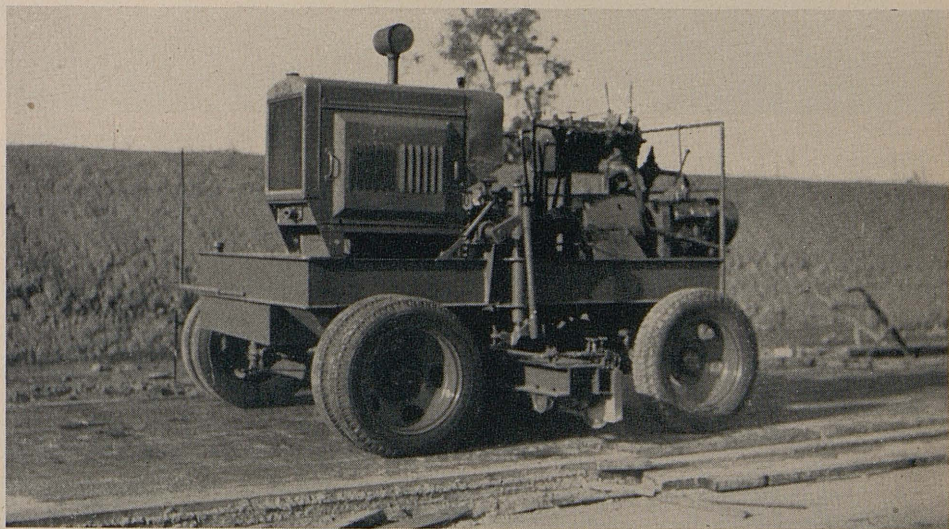
It is probable that new standards of accuracy and tolerance will be set up that will permit sufficient variation to allow the construction of future subgrades without cutting, as it was found that by careful distribution of the material, and careful rolling, the variations obtained were only slightly in excess of those permissible under the controlling specifications.

Results also indicated that some modifications might be made in curing material that would result in deeper penetration of the curing film.

#### HEADQUARTERS RESEARCH PROJECT

The Headquarters Office Laboratory is carrying on an interesting research project in connection with the use of an air-entraining agent to control the volumetric change in the concrete pavement. It is hoped that data leading to some modification in control joints for cracking can be developed from this study.

For comparison, a section of standard concrete was poured, with no



Upper—Ingenious machine used to cut weakened plane joints at 15-foot intervals on standard cement concrete pavement  
Lower—Concrete joint cutter operated by hand





Construction scene at site of new bridge for southbound traffic across San Mateo Creek

joints, and immediately adjoining another section with no joints but containing Vinsol-Resin, as an air-entraining agent. Comparative data will be kept on these sections for some time, and it is hoped that valuable information can be made available, covering the results.

Jim Beatty, Associate Testing Engineer, is representing the laboratory on this phase of the work.

Barring any unforeseen difficulties in the labor and materials situation, the entire section from Oceanside to San Clemente should be completed and fully opened to traffic by early fall.

The State is represented on various contracts by the following Resident Engineers: H. F. Caton, Contract 11VC5, SD, Ora-2-D, SCle; R. C. Payne, Contract 11VC7-F, SD-2-Ocn, C; W. H. Johnson, Contract 14VC6, SD-2-D; W. V. Cryderman, Contract 14GVC1-F, SD-2-C.

Realignment for southbound traffic across San Mateo Creek Valley





# SEAL COATING ON GUAM

By N. R. BANGERT, Assistant Maintenance Engineer

**T**O A Californian, March would seem to be a poor month for seal coat work, yet, at Guam in the Marianas Islands, some 13½ degrees north of the equator, March is a very favorable month for this phase of road maintenance.

During the latter part of March of this year I had the opportunity to assist the Navy in getting under way on Guam a program of sealing which was eventually to embrace the entire hard surfaced road system of the island, some 86 miles of equivalent 22-foot road.

The fame of California's Division of Highways apparently had been spread to the far corners of the Pacific by employees of the division attached to Seabee units during the war, as the Navy looked to California for advice when faced with the problem of providing protection for the very excellent system of paved roads on the island. Most of these roads have been constructed since the island was reoccupied in August of 1944.

## NAVY REQUESTS HELP

The Navy's request for the services of a man to assist resident personnel on the island in outlining the work and establishing proper rates of application of asphalt and rock, came through State Highway Engineer George T. McCoy early in March. It was my pleasure to be offered the opportunity to represent the division in this capacity.

As every effort was being made by the Navy to complete the seal coat project before the last of the Seabee units were deactivated and before the rainy season began, the trip to Guam was made by plane. The round trip required about 63¼ hours of flying time and embraced a distance of about 11,250 nautical miles. Travel was entirely by four-motored C-54 planes of the Naval Air Transport Service, stops being made at Honolulu, Johnston Island, and Kwajalein.

Rain fell nearly every day during my stay on Guam, yet March is considered one of the dry months of the year. The temperature was comfortable, warm, with a low of about 73 degrees and a high of 84 degrees. The annual rainfall for the island is re-

ported at about 100 inches. Cloudy skies were the rule and it was not uncommon to stop sealing operations several times during the day to allow the pavement to dry following a hard but brief tropical shower.

## CORAL USED ON BASE

Large deposits of coral located in the central part of the 200-square-mile island supplied the first engineer outfits that accompanied the assault troops ashore in 1944 with an excellent road material with which to construct many miles of modern highway in record time.

The coral used for base afforded a substantial foundation for the 2½ inches of asphalt concrete surfacing with which the major portion of the graded roads were paved. This asphalt concrete, used for both road and airfield construction, was produced from crushed quarried coral and 60-70 penetration asphalt cement. Five hot plants are said to have been in operation on the island while the construction program was at its height.

The 11 miles of Marine Drive, Route 1, which extends between the site of the former city of Agana and the warehouse and dock area at Apra Harbor is paved to a width of 44 feet. The pavement is bordered by 6-foot untreated coral shoulders. The so-called secondary roads which branch from Marine Drive to other important island installations are similarly bordered and carry pavements 22 feet or 33 feet in width.

## ASPHALT SHIPPED IN DRUMS

All asphalt used on the island is shipped in metal drums. The emptying of these drums, especially the ones containing the 60-70 penetration asphalt used for the asphalt concrete pavement construction and for sealing, presented a problem but one which had been ingeniously solved by the hot plant gangs during the early stages of construction.

Briefly, drums were brought in from the stockpile area on chain slings suspended from tractor mounted booms, tops were punctured to admit air and the bottoms of the drums all but cut off by means of an air chisel. The drums were then hoisted up an incline,

hung bottom down over the primary heating pit, and the top, sides and bottom heated by a large kerosene torch until the core of hard asphalt dropped from the metal container.

A quantity of mixing type emulsified asphalt was also in stock on the island and this material was used to a limited extent for surface sealing.

## LOTS OF EQUIPMENT, BUT—

The construction battalions were well supplied with the latest in oil and chip spreading equipment. Screenings of ½-inch by ¼-inch size were produced by crushing a quarried coral. Hauling was done by a fleet of six wheel, 5 cubic yard trucks. Oil distributors of a well known eastern make were mounted on four-wheel trailers, but these were found to be somewhat cumbersome to turn or to line up after a false start.

Although the island was literally weighted down by all types of heavy construction equipment, two items of equipment generally considered essential on seal coat jobs were lacking or at least, up until the time I left, had not been high-jacked from Army or Marine outfits. These were side sweeping power brooms and oil retorts.

Pavements were cleaned, for the most part, by compressed air supplemented by a push broom brigade of Jap prisoners. The asphalt, although initially heated by steam, was raised to the spreading temperature by means of the flue type heaters with which each distributor was equipped.

Tandem rollers of popular eastern make were available for rolling. However, this phase of the sealing operation was held to a minimum due to the soft aggregate used.

## PUBLIC WORKS BATTALION

The seal coating was carried on by the 109th Naval Construction Battalion with whom I was quartered while on the island. This outfit, a so-called Public Works Battalion, in addition to doing the seal coat work, also manned the only hot plant then in operation, and took care of the telephone, electric, and water supply systems on the island. Members of the 103d Naval Construction Battalion carried on a portion of the road maintenance and operated the quarry and

(Continued on page 32)



# Highway Bids and Contract Awards for April and May 1946

April 1946

**CONTRA COSTA COUNTY**—Portions between Pittsburg and 4 miles east of Brentwood, about 10.1 miles, shoulders to be widened with imported borrow and surfaced with plant-mixed surfacing and penetration treatment and a bridge to be widened. District IV, Route 75, Sections C, D. Contract awarded to Lee J. Immel, San Pablo, \$76,297.10.

**HUMBOLDT COUNTY**—Between Loleta and Fields Landing, about 4.0 miles, base to be reinforced and surfaced with plant-mixed surfacing. District I, Route 1, Section G. Contract awarded to Mercer Fraser Co., Eureka, \$89,643.

**KERN COUNTY**—Between Lost Hills and Wasco, about 4.7 miles, shoulders to be widened with imported borrow and untreated rock surfacing. District VI, Route 33, Section C. Williams Construction Co., Los Angeles, \$22,983; Brown, Doko & Baun, Pismo Beach, \$24,970; W. C. Railing, Redwood City, \$26,216; Volpa Brothers, Fresno, \$28,135; Griffith Company, Los Angeles, \$28,439; Jesse S. Smith, Glendale, \$28,675; Norman I. Fadel, North Hollywood, \$28,832; George E. France, Visalia, \$30,292. Contract awarded to Oilfields Trucking Co. & Phoenix Construction Co., Bakersfield, \$22,351.

**KERN COUNTY**—At Bakersfield, between Brundage Lane and 24th Street, about 1.9 miles, to be graded and paved with Portland cement concrete and asphalt concrete. District VI, Route 4, Section C, Bkd., J. E. Haddock, Ltd., Pasadena, \$474,378.55. Contract awarded to Griffith Co., Los Angeles, \$416,169.70.

**LASSEN COUNTY**—Between Viewland and Secret Valley, about 13.8 miles to be surfaced with imported gravel base and plant-mixed surfacing. District II, Route 73, Section B. W. C. Railing, Redwood City, \$121,035; Isbell Construction Co., Reno, \$121,679; A. Teichert & Son, Inc., Sacramento, \$121,761; Fahey-Hammond Inc., San Francisco, \$121,900; The Utah Construction Co., San Francisco, \$122,422; M. J. Ruddy & Son, Modesto, \$124,791. Contract awarded to E. B. Bishop, Orland, \$118,861.

**LOS ANGELES COUNTY**—In the cities of Los Angeles and Long Beach, on Terminal Island Freeway between Henry Ford Avenue and Willow Street, about 2.1 miles to be graded and paved with asphalt concrete. District VII. James I. Barnes Construction Co., Santa Monica, \$1,218,496; Griffith Co., Los Angeles, \$1,241,804; Warren Southwest Inc. and C. G. Willis & Sons, Inc., Los Angeles, \$1,278,986; Peter Kiewit Sons Co., Los Angeles, \$1,392,829; J. E. Haddock, Ltd., Pasadena, \$1,412,079; Guy F. Atkinson Co., Long Beach, \$1,436,000; Basich Bros. Construction Co. and Basich Bros., Alhambra, \$1,493,476; Clyde W. Wood, Inc., North Hollywood, \$1,592,457. Contract awarded to Macco Construction Co., Clearwater, \$1,141,080.

**LOS ANGELES COUNTY**—Over the tracks of the Union Pacific, Southern Pacific and Pacific Electric at Anaheim Street in the City of Los Angeles, a structural steel overhead crossing to be constructed. District VII, Terminal Island Freeway. Peter Kiewit Sons Co., Los Angeles, \$892,606; E. B. Bishop, Orland, \$897,226; Macco Construction Co., Clearwater, \$897,732; Guy F. Atkinson Co., Long Beach, \$905,030; Baruch Corp., Los Angeles, \$971,675; Robert E. McKee, Los Angeles, \$972,336; Griffith Co., Los Angeles, \$1,014,069. Contract awarded to E. W. Elliott Construction Co., San Francisco, \$849,357.

**LOS ANGELES COUNTY**—On Terminal Island Freeway over the tracks of the Union Pacific Railroad in the City of Los Angeles,

a structural steel overhead crossing to be constructed. District VII. E. B. Bishop, Orland, \$599,879; E. W. Elliott Construction Co., San Francisco, \$621,886; Guy F. Atkinson Co., Long Beach, \$622,734; Oberg Bros., Inglewood, \$625,379; Peter Kiewit Sons Co., Los Angeles, \$633,629; Robert E. McKee, Los Angeles, \$651,366; Pacific Bridge Co., San Francisco, \$658,915; George Pollock Co., Sacramento, \$663,504; Carlo Bongiovanni, Los Angeles, \$699,389; Griffith Co., Los Angeles, \$733,712. Contract awarded to Macco Construction Co., Clearwater, \$599,121.

**LOS ANGELES COUNTY**—In the Cities of Los Angeles and Long Beach on Pacific Coast Highway between Dominguez Channel and San Gabriel Avenue, about 0.7 mile to be graded and paved with asphalt concrete and four bridges to be constructed. District VII, Route 60. Griffith Co., Los Angeles, \$1,710,474; Macco Construction Co., Clearwater, \$1,756,854; Guy F. Atkinson Co., Long Beach, \$1,793,247; Peter Kiewit Sons Co., Los Angeles, \$1,862,841; Warren Southwest Inc. and C. G. Willis & Sons, Los Angeles, \$1,999,056. Contract awarded to James I. Barnes Construction Co., Santa Monica, \$1,672,266.

**LOS ANGELES COUNTY**—On Anaheim Street Approach Road from Terminal Island Freeway at Nicholson Avenue in the City of Los Angeles, a structural steel overhead crossing with graded approaches surfaced with asphalt concrete to be constructed. District VII. Macco Construction Co., Clearwater, \$267,333; Griffith Co., Los Angeles, \$269,224; Guy F. Atkinson Co., Long Beach, \$282,563; James I. Barnes Construction Co., Santa Monica, \$297,999; Norman I. Fadel, North Hollywood, \$331,217; The Contracting Engineers Co., Los Angeles, \$333,362. Contract awarded to Oberg Bros., Inglewood, \$264,279.

**LOS ANGELES COUNTY**—On Ramona Freeway between Macy Street and Indiana Street, a distance of about 1.9 miles, chain link fence to be furnished and installed. District VII, Route 26. Contract awarded to Alcorn Fence Co., Los Angeles, \$28,573.

**MENDOCINO COUNTY**—At Dooley Creek one mile east of Hopland, a reinforced concrete slab bridge on concrete pile bents to be constructed and about 0.12 mile of approaches to be graded and surfaced with road-mix surfacing and seal coat applied thereto. District I, Route 16, Section A. Erickson, Phillips & Weisberg, Oakland, \$43,055; Mercer Fraser Co., Eureka, \$40,420; Kiss Crane Company, San Pablo, \$47,128. Contract awarded to F. Fredenberg, Temple City, \$40,069.

**MERCED COUNTY**—Between Black Rascal Creek and Buhack Station, about 3.8 miles to be graded and paved with Portland cement concrete and four bridges to be constructed. District X, Route 4, Section C. Marshall S. Hanrahan, Redwood City, \$458,135; N. M. Ball Sons and Lew Jones Construction Co., Berkeley, \$477,077; Fredrickson & Watson Construction Co., Oakland, \$485,368; Guy F. Atkinson Company, South San Francisco, \$498,397; A. Teichert & Son, Inc., Sacramento, \$504,864. Contract awarded to Gunner Corporation, Pasadena, \$415,297.

**ORANGE COUNTY**—Between Los Patos Avenue and Sunset Beach and Second Street in Seal Beach, about 2.3 miles to be resurfaced with plant-mixed surfacing and shoulders to be widened with imported borrow and bituminous surface treatment applied. District VII, Route 60, Sections A, S1.B. Sully Miler Contracting Co., Long Beach, \$52,961; Owl Truck & Construction Co., Compton, \$54,897; J. E. Haddock, Ltd., Pasadena, \$55,091; Oswald Bros., Los Angeles, \$55,447; Jesse S. Smith, Glendale, \$56,200; John J. Swigart Co., Torrance, \$56,943. Contract

awarded to Griffith Co., Los Angeles, \$52,030.

**RIVERSIDE COUNTY**—Between 6 miles east of Desert Center and Hopkins Well, about 10.4 miles to be surfaced with road-mixed surfacing and a seal coat to be applied. District XI, Route 64, Sections C, D. Phoenix Construction Co. and Oilfields Trucking Co., Bakersfield, \$55,804; R. R. Hensler, Glendale, \$56,815; Basich Bros. Construction Co. and Basich Bros., Alhambra, \$68,950; Vinnell Co., Alhambra, \$71,254; Herz Paving Co., San Bernardino, \$78,176; Clyde W. Wood, Inc., North Hollywood, \$78,540; S. Edmondson & Sons, Los Angeles, \$81,467; J. E. Haddock, Ltd., Pasadena, \$83,652; Spencer Webb, Los Angeles, \$84,525; Owl Truck & Construction Co., Compton, \$85,950; Norman I. Fadel, North Hollywood, \$95,385. Contract awarded to Arthur A. Johnson, Laguna Beach, \$50,932.

**SAN BERNARDINO COUNTY**—Between Vineyard Avenue and Etiwanda Avenue, about 5.7 miles to be graded and paved with Portland cement concrete and reinforced concrete bridges to be constructed. District VIII, Route 26, Section D. Griffith Co., Los Angeles, \$491,169; N. M. Ball Sons, Los Angeles, \$520,561; Basich Bros. Construction Co. and Basich Bros., Alhambra, \$530,894; J. E. Haddock, Ltd., Pasadena, \$534,342; E. L. Yeager, Riverside, \$588,716; Peter Kiewit Sons' Co., Arcadia, \$612,371. Contract awarded to Matich Bros., Colton, \$478,203.

**YOLO COUNTY**—At State Highway nursery about three miles east of Davis, drilling and casing a water well. District III, Route 6, Section A. Contract awarded to R. L. Norris, Sacramento, \$1,960.

**SISKIYOU COUNTY**—At Dunsuir, about 0.15 mile in length, an 18-inch reinforced concrete pipe storm drain to be installed and existing cross-drains connected thereto. District II, Route 3, Section A. O'Connor Bros., Red Bluff, \$8,996; Luigi Costantino, Dunsuir, \$11,273. Contract awarded to M. W. Brown, Redding, \$8,237.

**SISKIYOU COUNTY**—Between Cougar and Dorris, about 31.7 miles, seal coat to be applied. District II, Route 72, Sections B, C. Folsom & Drollinger, Sacramento, \$37,880; Clements & Co., Hayward, \$40,955; Harms Bros., Sacramento, \$41,015; J. Henry Harris, Berkeley, \$44,705. Contract awarded to Morgan Construction Co., Pleasanton, \$36,937.

**SISKIYOU COUNTY**—Between Shasta River and Gazelle, about 7.8 miles to be surfaced with plant-mixed surfacing. District II, Route 3, Section B. Contract awarded to Clements & Co., Hayward, \$23,927.

**SISKIYOU COUNTY**—Portions between Weed and Yreka, about 20.4 miles to be surfaced with imported borrow base and plant-mixed surfacing. District II, Route 3, Section B. E. B. Bishop, Orland, \$174,004; Fredrickson Bros., Emeryville, \$189,463; W. C. Railing, Redwood City, \$201,107; J. P. Brennan, Redding, \$249,676. Contract awarded to Clements & Co. and Milo A. Browne, Hayward, \$166,885.

**SHASTA COUNTY**—Between 4.5 miles east of Ingot and Montgomery Creek, about 9.7 miles to be surfaced with plant-mixed surfacing. District II, Route 28, Section B. E. A. Forde, San Anselmo, \$55,910; E. B. Bishop, Orland, \$56,692; J. P. Brennan, Redding, \$57,065; Oilfields Trucking Company and Phoenix Construction Company, Bakersfield, \$58,392; C. M. Syar, Vallejo, \$71,339. Contract awarded to W. C. Railing, Redwood City, \$55,481.

**SANTA CLARA COUNTY**—On Bayshore Freeway at Santa Clara Street in the City of San Jose, a separation structure to be constructed and approaches about 0.6 mile in length to be graded and surfaced with Port-



land cement concrete and asphalt concrete on crusher run base. District IV, Routes 68, 2, Section S.Js. Macco Construction Co., Clearwater, \$394,395; N. M. Ball Sons & Lew Jones Construction Co., Berkeley, \$395,457; Caputo & Edward Keeble, San Jose, \$40,710; Earl W. Heple, San Jose, \$415,600. Contract awarded to Fredrickson & Watson Construction Co., Oakland, \$379,441.

**SAN DIEGO COUNTY**—About 17 miles east of Oceanside across San Luis Rey River and Keys Canyon Creek, two steel girder bridges to be constructed. District XI, Route 77, Section G. C. B. Tuttle & Schmidt Bros. Contractors, Long Beach, \$180,461; Macco Construction Co., Clearwater, \$180,480; Fred D. Kyle, Pasadena, \$181,144; Haddock Engineers, Ltd., Oceanside, \$209,629; M. H. Golden Construction Co., San Diego, \$203,693. Contract awarded to Spencer Webb, Los Angeles, \$167,316.

**SAN DIEGO COUNTY**—Across Samagatuma Creek and Descanso Creek near Descanso, two bridges and approaches to be constructed. District XI, Route 78, Section A. M. H. Golden Construction, San Diego, \$92,634; Carrol & Foster, San Diego, \$102,643. Contract awarded to Oberg & Cook, Los Angeles, \$87,433.

**SAN DIEGO COUNTY**—Between 2 and 17 miles north of Moretti's, reinforced concrete slab bridges to be constructed across Matagual Valley Creek, Canada Verde Creek, and Acorn Creek. District XI, Route 78, Sections D, E. Oberg & Cook, Los Angeles, \$45,053; Macco Construction Co., Clearwater, \$48,745; F. Fredenburg, Temple City, \$49,826; C. B. Tuttle, Long Beach, \$49,878; Thorsten & Dähl, Santa Monica, \$60,206; Walter H. Barber, La Mesa, \$61,028; Haddock Engineers, Ltd., Oceanside, \$73,850. Contract awarded to O'Rourke & Parker, Garvey, \$59,344.

**SAN DIEGO COUNTY**—Between 0.4 mile south of Mission Valley Road and 0.5 mile north of the north city limits of San Diego, about 4.1 miles to be graded and surfaced with Portland cement concrete pavement. District XI, Route 77, Section SD. A. N. M. Ball Sons, Los Angeles, \$1,118,768; Griffith Co., Los Angeles, \$1,142,807; Peter Kiewit Sons Co., Arcadia, \$1,194,389; Bressi & Bevanda Constructors, Inc. & R. E. Hazard & Sons Contracting Co., Los Angeles, \$1,260,162; Daley Corp., San Diego, \$1,270,722; J. E. Haddock, Ltd., Pasadena, \$1,376,564; V. R. Dennis Construction Co., San Diego, \$1,589,411. Contract awarded to Basich Bros. Construction Co. and Basich Bros., Alhambra, \$1,098,840.

**CONTRA COSTA COUNTY**—Portions between Pittsburg and 4 miles east of Brentwood, about 10.1 miles, shoulders to be widened with imported borrow and surfaced with plant-mixed surfacing and penetration treatment and a bridge to be widened. District IV, Route 75, Sections C,D. Contract awarded to Lee J. Immel, San Pablo, \$76,297.10.

**HUMBOLDT COUNTY**—Between Loleta and Fields Landing, about 4.0 miles in length, base to be reinforced and surfaced with plant-mixed surfacing. District I, Route 1, Section G. Contract awarded to Mercer Fraser Co., Eureka, \$89,643.

**KERN COUNTY**—Between Lost Hills and Wasco about 4.7 miles, shoulders to be widened with imported borrow and untreated rock surfacing. District VI, Route 33, Section C. Williams Construction Co., Los Angeles, \$22,983; Brown, Doko & Baun, Pismo Beach, \$24,970; W. C. Railing, Redwood City, \$26,216; Volpa Brothers, Fresno, \$28,135; Griffith Company, Los Angeles, \$28,439; Jesse S. Smith, Glendale, \$28,675; Norman I. Fadel, North Hollywood, \$28,832; George E. France, Visalia, \$30,292. Contract awarded to Oilfields Trucking Co. & Phoenix Construction Co., Bakersfield, \$22,351.

**KERN COUNTY**—At Bakersfield, between Brundage Lane and 24th Street, about 1.9 miles to be graded and paved with Portland

cement concrete and asphalt concrete. District VI, Route 4, Section C, Bkd. J. E. Haddock, Ltd., Pasadena, \$474,378.55. Contract awarded to Griffith Co., Los Angeles, \$416,169.70.

## May 1946

**BUTTE COUNTY**—Between Oroville Wye and Nelson, between Durham railroad crossing and Chico and between Big Chico Creek and Sixth Street in Chico, about 11.8 miles in net length, existing surfacing to be repaired with plant-mixed surfacing and crusher run base and borders and shoulders to be constructed of crusher run base and imported borrow. District III, Route 3, B, C. Che. J. E. Johnston, Stockton, \$117,700. Contract awarded to Lester L. Rice, Marysville, \$104,971.25.

**DEL NORTE COUNTY**—Between 6.3 miles and 2.6 miles south of Crescent City, about 3.7 miles, imported base material to be placed and a seal coat applied thereto. District I, Route 1, Section B. Fairey-Hammond, Inc., San Francisco, \$101,096; Mercer-Fraser Company, Eureka, \$102,423. Contract awarded to W. C. Railing, Redwood City, \$100,845.30.

**HUMBOLDT COUNTY**—Between Patrick's Point and Big Lagoon, about 3.4 miles to be surfaced with plant-mixed surfacing on imported base material and a seal coat to be applied to the plant-mixed surfacing. District I, Route 1, Section J. W. C. Railing, Redwood City, \$95,185; Fairey-Hammond, Inc., San Francisco, \$112,811; Westbrook & Pope, Sacramento, \$102,620. Contract awarded to Mercer, Fraser Company, Eureka, \$92,375.

**KERN COUNTY**—Between 1.6 miles and 1.25 miles south of Grapevine Station, traffic deflector to be furnished and installed. District VI, Route 4, Section A. George von KleinSmid, Bakersfield, \$22,300. Contract awarded to Griffith Co., Los Angeles, \$19,980.

**LAKE COUNTY**—Between one and two miles south of Upper Lake, two bridges to be constructed, one across Robinson Creek and the other across Scott Creek. District I, Route 89, Section E. Erickson Phillips & Weisberg, Oakland, \$147,053; R. G. Clifford, South San Francisco, \$149,157. Contract awarded to Kiss Crane Co., San Pablo, \$129,345.20.

**MENDOCINO COUNTY**—Between Willets and 2.6 miles northerly, about 2.6 miles in length to be surfaced with plant-mixed surfacing on imported base material. District I, Route 1, Section F. A. R. McEwen, Sacramento, \$72,160; Clements & Co., Hayward, \$79,952; Fairey-Hammond, Inc., San Francisco, \$83,516. Contract awarded to C. M. Syar, Vallejo, \$69,726.

**MENDOCINO COUNTY**—At Slick Rock Creek about 5.6 miles south of Point Arena, about 1 mile to be graded and imported base material placed. District I, Route 56, Section A. Harms Bros., Sacramento, \$128,844; Peter Sorensen, Redwood City, \$136,291; J. Henry Harris, Berkeley, \$140,689; Louis Biasotti & Son, Stockton, \$174,095. Contract awarded to Piombo Bros. & Co., San Francisco, \$121,695.

**PLUMAS COUNTY**—Across Hamilton Branch between Big Meadows Dam and Lassen County line, a steel girder bridge with concrete deck to be constructed. District II, Route 523, M. A. Jenkins, Sacramento, \$73,880; S. J. Amoroso Construction Co., San Francisco, \$93,449; Erickson, Phillips & Weisberg, Oakland, \$98,267. Contract awarded to Kiss Crane Company, San Pablo, \$72,173.

**SAN BERNARDINO COUNTY**—Between Highland Avenue and City Creek Bridge, about 3.2 miles, to be graded and surfaced with plant-mixed surfacing, and a bridge to be constructed across City Creek. District VIII, Route 207, Section A. Nathan A. Moore, San Gabriel, Alt. "A," \$817,472;

Westbrook & Pope and E. B. Bishop, Sacramento, Alt. "B," \$913,632; C. G. Willis & Sons, Los Angeles, Alt. "B," \$1,049,660; Vinnell Co., Alhambra, Alt. "B," \$1,249,655; Peter Kiewit Sons' Co., Arcadia, Alt. "B," \$1,326,049. Contract awarded to Denni Investment Corp., Wilmington, Alt. "B," \$652,359.

**SAN JOAQUIN COUNTY**—Between Byron Road and Banta Road, a distance of about 5.5 miles to be repaired with untreated rock base and plant-mixed surfacing. District X, Route 5, Section A, Tra. Geo. French, Jr., Stockton, \$114,354; Fredrickson Bros., Emeryville, \$114,680; Louis Biasotti & Son, Stockton, \$119,704; A. Teichert & Son, Inc., Sacramento, \$126,526; M. J. B. Construction Co., Stockton, \$165,817. Contract awarded to M. J. Ruddy & Son, Modesto, \$113,002.

**TRINITY COUNTY**—Constructing a bridge about 58 miles west of Red Bluff across Hayfork Creek. District II, Route 29, Section A. O'Connor Bros., Red Bluff, \$8,260; Evans Construction Co., Berkeley, \$9,833. Contract awarded to C. C. Gildersleeve, Willows, \$7,573.62.

**YOLO COUNTY**—Between one mile east of Davis and Swingle and between 2½ miles north of Arcade Station and junction Route 6, a length of about 7.3 miles to be repaired with plant-mixed surfacing and crusher run base. District III, Routes 6, 99, Sections A,B. J. R. Reeves, Sacramento, \$78,171. Contract awarded to A. Teichert & Son, Inc., Sacramento, \$71,525.

**YOLO COUNTY**—Between Cache Creek and Dunnigan, about 14 miles to be repaired with plant-mixed surfacing and crusher run base and imported borrow to be placed on shoulders. District III Route 7, Sections B,C. McGillivray Construction Co., Sacramento, \$157,122; A. Teichert & Son, Inc., Sacramento, \$160,910; J. R. Reeves, Sacramento, \$163,018; Harms Bros., Sacramento, \$165,722; Lester L. Rice, Marysville, \$197,862; Fairey-Hammond, Inc. and Louis Biasotti and Son, San Francisco, \$198,639. Contract awarded to Fredrickson Bros., Emeryville, \$149,536.25.

**ALAMEDA AND CONTRA COSTA COUNTIES**—Portions between El Cerrito Hill Overhead in Albany and Carquinez Bridge, about 10.5 miles in length, shoulders to be repaired with crusher run base, plant-mixed surfacing and penetration treatment and a decelerating lane to be constructed. District IV, Routes 69,14, Sections Alb, Reh, ECR, A, Pin, Her, B. Lee J. Immel, San Pablo, \$82,291; J. Henry Harris, Berkeley, \$84,714; C. M. Syar, Vallejo, \$97,634; Independent Construction Co., Ltd., Oakland, \$121,882. Contract awarded to J. R. Armstrong Construction Co., El Cerrito, \$79,668.80.

**CALAVERAS COUNTY**—Construct cattle pass about nine miles north of Angels Camp. District X, Route 65, Section B. Patrick M. Sofarelli, Hayward, \$8,109; C. C. Gildersleeve, Willows, \$7,446. Contract awarded to Bati Rocca, Stockton, \$4,827.

**KERN COUNTY**—Between Famoso and Cecil Avenue in Delano, about 10.4 miles to be repaired with plant-mixed surfacing. District VI, Route 4, Section F,Dln. Gunner Corporation, Pasadena, \$102,650. Contract awarded to Griffith Co., Los Angeles, \$90,532.

**MODOC COUNTY**—Between Eagleville and 4 miles north of Lake City, about 29.5 miles, portions to be graded, plant mixed surfacing to be placed on new subgrade and existing surfacing, and seal coat to be applied thereto. District II, Route 513, Sections B,C,D. A. Teichert & Son, Inc., Sacramento, \$418,836; Lester L. Rice, Marysville, \$426,374. Contract awarded to E. B. Bishop & D. Gerald Bing, Orland, \$409,590.50.

Lawyer—"Now if you want my honest opinion—"

Client—"I don't. I want your professional advice."



# NEED FOR MORE DIVIDED HIGHWAYS

The following address was delivered by C. H. Purcell, Director of Public Works, at the Traffic Safety Conference held at the call of Governor Earl Warren in Sacramento on May 1, 1946.

CALIFORNIA today is facing a very serious and alarming problem in motor transport. The congestion of traffic on the main-line highways of the State, both inside and outside the cities, has become so aggravated that there is actually a serious bottleneck to the movement of all those products which are produced in the State, and which must be moved by motor transport over at least a portion of the trip from producer to consumer. The seriousness of this clogging of the arteries of the motor transport system is manifest in the enormous toll that is being taken daily through the economic loss occasioned by traffic accidents.

That traffic congestion and traffic accidents are very closely related and must be given simultaneous consideration is immediately apparent when it is realized that about 60 per cent of the traffic accidents reported on the rural State highways of the State occur on only 1,600 miles of that system—and that these particular sections are all carrying more traffic than can be safely accommodated on two lanes.

I do not want to bore you with statistical data, but there are a few highlights in connection with traffic accidents that are necessary to have in mind in any consideration of remedial measures. I am speaking with regard to rural State highways. About 40 per cent of the accidents occur at intersections. And about 30 per cent are reported as being head-on collisions.

Considering these facts, together with the fact just stated that the majority of accidents occur on crowded two-lane highways, it would appear that the divided multiple-lane highway should provide for safer movement of traffic. Actually, this is true. We have already constructed and have in operation a sufficient mileage of divided highways to know that not only do they relieve the congestion and clogging of traffic that occurs on two-lane roads carrying comparable traffic, but also there are fewer accidents. Intersection structures which separate traffic streams at grade, and intersection control likewise, very materially improve operating conditions.

The traffic accident record for the City of Los Angeles for the year 1945

shows that 70 per cent—seven out of every ten—of the persons killed in traffic accidents were pedestrians. If we will provide means to separate pedestrian from high-speed motor traffic we will reduce the accident toll. Pedestrian accidents do not occur on freeways, simply because pedestrians are not permitted to use freeways.

The perplexing problem of traffic accidents the State is facing and about which something most certainly must be done if California is to go forward as it should in the economic scheme of things, has given me personally much concern for a long time. And I assure you that it is very gratifying to me that this enlightened and serious-minded group of citizens has been called together by Governor Warren to formulate a California program, which I hope can be presented with a united front at the Conference called by the President to meet in Washington later in the month.

It is also a source of considerable satisfaction to me that the Legislature has recognized the pressing importance of the motor transport problem to California through the appointment of an interim legislative committee. This committee, I understand, is making a very thorough and comprehensive analysis of the entire highway, street, and bridge problem of the State.

The Division of Highways has recently prepared and submitted to the Legislature a Critical Deficiency Report on the State highway system. In this report it defined a critical deficiency in such terms as: Critical Bridges—Bridges that are considered critical because they were about ready to fall down. Some of them have already fallen down since the report was made. Other deficiencies were defined as inadequate lane capacity, as inadequate roadway from a structural standpoint, and so on, in such terms as engineers use.

Of this entire Critical Deficiency Program, about 77 per cent in dollar volume was because of inadequate width of roadway to accommodate the present daily traffic. In other words, our greatest and most expensive highway need today is for more room, more paved area on which motor vehicles

can operate. And because of this lack of elbow room there are heavy concentrations of traffic accidents.

This congestion is, quite naturally, more pronounced and more aggravated at intersections, where traffic streams converge and cross; hence the greater accident concentration at places of cross movement. The intersection problem is especially pronounced, and there is a pressing and urgent demand and need for installation of traffic signals. A recent estimate compiled by the Division of Highways shows a need for such signal installations in excess of \$1,000,000.

These deficiencies on the highway system; this inadequate provision for daily movement, the inadequacy of bridges and intersections, have been gradually accumulating since before the war.

While there has been an increase in total gasoline tax and registration fees during the last 10 or 12 years prior to the war, the road cost for traffic service per vehicle unit increased so materially that there has been a gradual losing of ground insofar as overall improvement of the entire highway system was concerned. As a result, we are now reaping the harvest in terms of traffic congestion and traffic accidents.

With all that is being done, I feel that we can look forward with reasonable assurance that the beginning of a solution of some of the serious problems with which we are beset is at least in sight.

There is much that can be done and is being done to alleviate the traffic accident toll by the Motor Vehicle Department, and particularly the California Highway Patrol. The education of younger drivers is proving to be of material benefit; and other agencies, such as the automobile clubs, the safety councils, the traffic courts, are all doing good, sound work.

But the real need, the most important work to be done, the one thing above all others that will solve this most urgent problem, is the providing of adequate highways—a place for motor traffic to move.



# CALIFORNIA MISSIONS

(Continued from page 19)

which he had been treated, and of the 'involved difficulties' put in the way by the missionary of an unprofitable asistencia (He was wrong; San Rafael was a mission at this date) through 'underhand efforts,' and the aid of 'confederate padres.'

"The Fr. Presidente, he goes on, had obstinately kept silent, though not worse in health than usual and perfectly able to confirm the orders of his predecessor. The confederates were all blind to the circumstances and had exerted themselves in the office of Satan by throwing obstacles in the way of a great enterprise, especially Fr. Duran (missionary of Mission San Jose). The new presidente, too, seemed to be one of the plotters, inasmuch as he had complained that his permission should have been awaited, though all might have died before it came. The angry young friar then concluded in substance as follows: 'I wish to know whether the diputacion has any authority in this province, and if these men can overthrow Your Honor's wise provision. If I can not do it here, where as we all agree is the best spot in California for the purpose, I will leave the country.'"

## GOVERNOR COMPROMISES

From San Juan Bautista, Fr. Sarria wrote a long letter of protest to the Governor. The latter replied to the effect that inasmuch as the Franciscans had during 50 years made no progress in the conversion of the northern Indians, the secular authority proposed to take charge. The Governor compromised with Presidente Sarria by abandoning efforts to move Mission Dolores and Mission San Rafael to Sonoma and Fr. Sarria permitted Fr. Altimira to take up his quarters at Sonoma.

In 1924 the mission had a granary, priest's house and seven habitations for guards. At the close of that year the station had 693 neophytes, all but 96 of whom had come from Missions Dolores, San Rafael and San Jose. When General Mariano Vallejo was made comisionado in 1834, Mission Solano was secularized and its movable property distributed among the Indians, most of whom returned to their rancherias. During the 11 years of its existence the records of the mission showed 1,315 baptisms, 278 marriages and 651 deaths. The station never was a prosperous one.

General Vallejo was ordered in 1834 to lay out a pueblo around the mission. Thus began the present-day town of Sonoma. The old mission chapel became the parish church and was used until 1880, when a new church was erected with funds derived from the sale of the old mission and grounds by Bishop Alemany to a German named Schocken. The latter used the mission for storing hay and wine. In 1903 the property was acquired by W. R. Hearst for \$5,000.

## MISSION NOW STATE MUSEUM

On the northeast corner of the Plaza laid out by Vallejo is the Bear Flag Monument, marking the spot where the Bear Flag of California Republic was raised on June 14, 1846. Nearby is the mission and just north of the monument are the old Mexican barracks erected in 1836 to quarter Mexican troops. One block east is the Ray House of wood and adobe built in 1846 and which was U. S. Army headquarters in the late forties.

The Sonoma Valley Woman's Club interested itself in the old mission in 1910, obtained a lease on the property and raised funds to make necessary repairs. The club had the cooperation of the Native Sons and Daughters of Sonoma and other towns and cities. A public fund was raised, the property was purchased and then presented to the State of California. The Legislature made an appropriation for restoration and on June 14, 1914, Mission San Francisco Solano was opened to the public as a museum and State landmark. Situated in the heart of the Valley of the Moon, it is well worth a visit.

And so, with Mission San Francisco Solano ends this series of stories of the California Missions which ever will stand as monuments to Fr. Junipero Serra and his faithful colleagues.

Visitors to Mission San Francisco Solano from the south will follow U. S. 101 from Sausalito to Petaluma and turn east on State Route 104 to Sonoma. Coming from the north, leave U. S. 101 at Santa Rosa and follow State Route 51 direct to Sonoma. The route from Sacramento Valley is by State Route 6 from Sacramento to Napa, thence west to State Route 51 and five miles north to Sonoma.

The End

## In Memoriam

Glenn B. Ashcroft

**T**HE DIVISION of Architecture mourns the death on April 25, 1946, of Glenn B. Ashcroft, Senior Structural Engineer. Mr. Ashcroft was born October 28, 1874, in Ohio and was a direct descendant of Ethan Allen, famed Revolutionary leader of Vermont's "Green Mountain Boys." His technical training was obtained at the Case School of Applied Science and Baldwin-Wallace College. After graduation he worked for a time in Canada and in the Eastern United States, coming to California in 1907.

For many years he was a structural engineer with the architectural office of the late Henry H. Meyers of San Francisco and, while there, was identified with a number of California's prominent engineering and architectural works. He had been with the structural engineering section of the State Division of Architecture since January 6, 1930, except for a short period while in war work. Most of his service has been with the Sacramento office; however, after the Long Beach earthquake of March, 1933, he spent several years in the Los Angeles office of the division in connection with the reconstruction of earthquake damaged public schools. Although eligible for retirement in 1944, he was asked to remain to assist with the division's postwar program.

Mr. Ashcroft was a very active outdoor man who took a great interest in many subjects such as botany, geology, early California history, and native Indian relics. His wide fund of information made him an interesting companion on trips through California. When scraps of what seemed might be worthwhile historic or scientific facts came to him, he would patiently gather and match the shreds of information together until he had pieced out the whole story. In these searches he often turned up interesting relics, some of which may be seen at Sutter's Fort. The March-April number of "California Highways and Public Works" contained an article by him entitled, "Ancient Weather Map on U. S. Highway 40."

In one of his many-sided spare-time activities he made an English translation of the German technical reference book "Rahmenformeln" by Kleinlogel. This translation is still being used in the division. A certificated architect as well as a registered civil and structural engineer, he was a member of various technical and professional societies such as the Structural Engineers Association of Northern California, the Seismological Society of America, and the Engineering Institute of Canada. He was also a member of the Rosicrucian Order. He was married on October 21, 1902, to Emmy D. Poock who died in 1938. He is survived by a daughter, Mrs. Herbert H. Mensing, a son, William G. Ashcroft, both of Alameda, California, and two grandchildren.



## QUAKES NOT SO POPULAR

By W. L. SAVAGE

Assistant Maintenance Engineer

**I**F THEY never experience another earthquake it will be just fine and dandy with the men of the maintenance department of District IX.

In addition to breaking the Los Angeles Aqueduct near Boulder Peak, eight miles south of Little Lake, Inyo County, causing the flooding of State Route 23, just north of the junction of U. S. 395 and U. S. 6, the earthquake shocks in southern Inyo and eastern Kern counties last March gave the maintenance crews of District IX a big job of removing rock slides from State Route 57, known as the Walker Pass Road, between Freeman Junction and Bakersfield.

The slopes adjacent to the roadway in this area, five to ten miles west of Walker Pass Summit, are dotted with large loose rock varying in size from small boulders to some possibly 100 tons in weight.

Following the first quake, much of this rock was loosened, rolled down the hillsides and was either deposited upon the roadbed or continued across and into the canyon below.

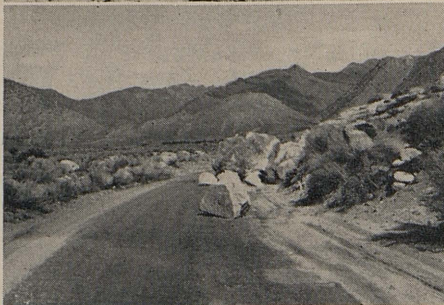
Holes were gouged into the pavement two feet in depth. Numerous wide cracks and fill settlements occurred in this area.

It was possible for cars to pass around or between the boulders, but the logging trucks using this route were unable to continue to travel until the rock was removed.

It was necessary to blast the larger rocks before they could be removed with a tractor.

The epicenter of the shocks was a location approximately 30 miles northeast of Weldon. Three distinct quakes were felt. The first beginning at 5.25, the second at 5.55, and the third at 6.03 a.m., on March 15th, each lasting approximately 30 seconds.

The 5.25 a.m. shock broke the Los Angeles Aqueduct near Boulder Peak about eight miles south of Little Lake, causing the 200 second-feet of water contained in 25 miles of the aqueduct to be released and poured down what is known as Nine-Mile Canyon crossing State Route 23, the Los Angeles to Reno highway.



These photos show some of the larger rocks which blocked State Route 57 following earthquake jolts

## In Memoriam

Robert E. Svedeen

**T**HE San Francisco-Oakland Bay Bridge regrets to announce the death of Robert E. Svedeen on June 3, 1944, while on active service in the United States Navy.

Mr. Svedeen was in the service of the State for only a few months, but during that time he made many friends, especially among those who were closely associated with him in his work. He worked with the traveling bridge painting crew for several months. On June 2, 1941 he went to the San Francisco-Oakland Bay Bridge as a structural steel painter, remaining in this position until called into the Navy on August 27, 1941.

Born in Los Angeles, March 28, 1913, he received his education in the public schools of that city and in Hollywood High School. He served in the Navy from 1930 to 1934, and thereafter worked as a painter on several jobs, including the original painting of the San Francisco-Oakland Bay Bridge.

He is survived by his widow to whom his former fellow employees extend sincere sympathy.

## In Memoriam

Harry Scott McAlpine

**H**ARRY SCOTT McALPINE, electrician employed on the San Francisco-Oakland Bay Bridge, passed away suddenly at work on April 11, 1946.

Mr. McAlpine was born in San Francisco on April 24, 1887. He attended the public schools and, upon graduation, chose the electrical trade for his profession. He was employed by various San Francisco contractors and also worked at intervals for several State agencies from 1931 to 1935, at which time he was appointed to a permanent position of journeyman electrician for the State on the construction of the San Francisco-Oakland Bay Bridge. He was transferred to maintenance on November 17, 1936, where he remained until his death.

Mr. McAlpine was a member of Fairmont Lodge No. 435, F. & A. M.; Fraternal Order of Eagles, and the Macabees.

Beloved by all who knew him, his untimely passing is deeply felt by his many friends and associates on the Bay Bridge and elsewhere who recognized in him a master of his profession.

He is survived by his wife, Alice, and two daughters, Wilfred McAlpine and Barbara McAlpine Anderson.



# State Government Moves to Solve Critical Lumber Shortage

(Continued from page 2)

erans housing and are even now actually making loans at the rate of \$3,000,000 a month.

## VETERANS' LOAN PROGRAM

"Our veterans' loan program to date has resulted in more applications from World War II veterans than were received from World War I veterans during the entire period from 1920 to 1941.

"The State has appropriated \$7,500,000 to provide emergency housing for veterans. This was the amount recommended for the purpose by the Federal Government which pledged itself to spend \$45,000,000 to move surplus structures into areas where a housing crisis existed. The State agreed to pay 90 per cent of the cost of making the houses livable and it was decided that local agencies would be asked to contribute the remaining 10 per cent. Therefore the State's appropriation makes possible the immediate expenditure of \$53,250,000 for emergency housing. This does not include the cost of the buildings which would aggregate another \$45,000,000.

"The State has made \$8,000,000 available for housing at the University of California and the State colleges. The enabling legislation permits the issuance of revenue bonds and the raising of the actual total available to \$16,000,000. In addition the State has provided \$2,000,000 for emergency housing for agricultural workers.

"Totaling these figures we find the State Legislature has made available for housing expenditures some \$171,250,000. This is without reference to the great reservoir of private funds available for investment in housing.

## LUMBER SHORTAGE OBSTACLE

"Our difficulty is not a shortage of funds. Neither in public funds already authorized for expenditure nor in the field of private investment do we find the bottleneck which is stifling the building of homes. I have been assured that there is ready to be launched in this State whenever building materials are made available, the greatest home building program that has ever been undertaken in any State of the Union.

"The question is when building materials will be made available. It is paradoxical that our veterans cannot take full advantage of the opportuni-

ties gratefully extended to them due to material shortage. One of the short materials is lumber. There are those who will speak to you today who will tell us just how short lumber is. It should be our purpose to determine what part a lack of roads may play in that shortage and what can be done.

"For months State Government has been working on the problem presented by these bottlenecks and now believes that many of them can be broken through cooperative action on the part of all agencies and groups represented here today.

## HOUSING SHORTAGE FIGURES

"While the problem we are met here today to consider primarily is that of inadequate highway transportation facilities, for the more rapid movement of lumber from forest to market, it might be well to quote some housing shortage figures which show the need for prompt cooperative effort to achieve an early solution of the basic problem involved.

"During the five-year period 1935-1940, a total of 300,000 new homes were constructed in California.

"The latest authoritative estimates of the Reconstruction and Reemployment Commission show that the immediate and urgent housing requirements of the State at the present time are 250,000 houses.

"It is conservatively estimated that 10,000 board feet of lumber are required for the average home. Multiplying this figure by 250,000 the minimum number of homes desperately needed in California at the present time reveals a pressing need for 2½ billion board feet of lumber.

"Actually it is estimated that with California's increasing population and the new requirements of the veterans a total of 625,000 homes will be needed in this State within the next five years. For this period the housing needs of Los Angeles County are estimated at 280,000 homes, of San Diego County 20,000, of the remaining Southern California Counties 25,000, and in the Northern California section 300,000 homes, of which 70 per cent are in the metropolitan areas of San Francisco, Alameda, Fresno, Sacramento, San Jose, and Stockton.

"Our pressing need for 2½ billion board feet of lumber for our immediate and urgent needs for homes looms

larger in view of the estimates of total lumber production in the five major western lumber producing States. It is conservatively estimated that this production will run between 14 and 15½ billion board feet for all purposes. Only half of the lumber produced can be expected to be available for housing. It becomes obvious that unless the production of lumber can be increased the State of California is not going to get even its immediate and urgent requirements of lumber.

## SITUATION IS SERIOUS

"The situation confronting us is serious. It calls for emergency action. The State Government has been cooperating with Federal and local agencies in the erection of emergency housing and I want to see the same type of cooperation translated into action on the lumbering problem. I am determined that the State will not overlook any opportunity to be of service. I hope we will be able to enlist the assistance of every group and agency that can help speed the movement of lumber to those sections of California now in such desperate need of building material.

"Of course we recognize that there are numerous other bottlenecks in home building construction material such as sheet rock, cast iron pipe, soil pipe, and other materials, but I think our chief concern here today is with the highway transportation bottleneck which is impeding the movement of lumber from forest to market.

"We do not hope to solve all our highway problems here today. We can now consider only our pressing needs for the immediate emergency. But we can through cooperative effort find a remedy which will assist us in meeting the urgent emergency needs of our lumber industry to which we must look for so much in this crisis."

## FIRST TO LIGHT STREETS

Paris was the first city to have lighted streets. At about the beginning of the 18th century, the Paris police ordered every householder to keep a lamp burning in a street window from 9 o'clock in the evening through the night. A few years later, tallow-burning lanterns were suspended by chains at regular intervals along the centers of Paris streets.



# Seal Coating on the Island of Guam

(Continued from page 25)

crushing plant which produced the seal coat screenings.

Excellent work was done by these battalions although they were composed of young men who had had little or no practical construction experience in civilian life. The average age of the members of the 109th Battalion was 19.1 years. Captain F. C. Bedell was the Officer in Charge of Construction at Guam, and Lieutenant Commander Thomas P. Cocks was in charge of the 109th Battalion.

## TYPHOON SCARE

Native villages, although out of bounds without a pass, were quite picturesque, especially those at the south end of the island which were the least damaged by the reoccupation maneuvers. Many of the native villages in the central part of the island had been rebuilt, but palm thatch and coconut logs had given way to corrugated metal and cut lumber.

During my stay on the island all construction activities were brought to a standstill by a typhoon. First warnings of the approaching storm which originated in the vicinity of Truk to the southeast, were received on a Thursday morning. Its center was expected to pass between Guam and Saipan some 100 miles to the north and winds of moderate intensity were predicted. The velocity of the wind increased throughout the morning of that day, and by noon all but essential work was stopped and outfits were confined to camps.

On Friday it was learned that the path of the storm had shifted towards Guam and men who had gone through the typhoon at Okinawa in 1945 openly expressed their dread of a similar experience.

## PREPARE FOR BLOW

When it became apparent that the island was in for a real blow, all hands fell to the job of staking down as much of the camp as possible. Battalion records were deposited in bomb proof shelters, personal gear stowed in the strongest warehouse buildings, and a number of quonset huts in the nearby hospital area were lashed to pole anchors hastily set by telephone crews for use by enlisted personnel.

Up in the "officer's country" heavy asphalt trucks, line trucks, and tractors were parked between the tents to

act as wind breaks and serve as anchors for lines thrown over the tent peaks.

Elsewhere on the island, outfits actually "dug in" with power shovels for protection, and much of the native population was transported by bus to caves. Many of the ships in the harbor put to sea to avoid the possibility of being blown aground.

## TIDAL WAVE MISSES GUAM

Strong wind from the northeast accompanied by rain, lashed the camp all during the fore part of Saturday. Some tents collapsed and a number of unoccupied quonset huts were shifted from their foundations of coconut logs. Shortly before noon, the island radio station WXLI announced that the storm had reached its maximum about 10 a.m., and that the center had passed, on its westward course, about 50 miles south of the island. Official sources reported a maximum wind velocity of 63 knots per hour.

As the storm subsided a sigh of relief went up from even the hardiest of those Navy men, as severe damage to the great warehouse area at Apra Harbor would have meant months of additional work and cancellation of that long anticipated trip home. Only two days were required to reorganize the camp and rebuild damaged facilities.

Work returned to normal on a Tuesday only to be abruptly interrupted that afternoon by an official radio report that a tidal wave was expected to strike the island within an hour and all hands were ordered to high ground. Within a few minutes roads within the dock and warehouse area were jammed with everything that would roll towards the hills. Although precautions were taken that night to move all outfits to high ground, the tidal wave which wrought such severe damage at Hilo in the Hawaiian Islands failed to materialize at Guam.

Wife—"I heard you talking to yourself while you were taking your bath, John. That's a bad habit."

Husband—"I wasn't talking to myself; I was talking to the soap. I slipped on it."

"Why so melancholy?"

"My girl rejected me last night."

"Well, buck up. There are plenty more girls."

"Yes, I know. But I feel so sorry for her."

# DONNER CENTENNIAL

(Continued from page 7)

living in 1918, and where she died the age of nearly 79 years, February 19, 1922.

## REED'S PART IN EXPEDITION

Martha Jane (Little Patty) Reed Lewis was the younger of the two daughters of Jim Reed who was one of the original leaders of the party. Reed, because of an incident leading to the death, by his hand, of one of the members of the party, was banished shortly after the party left the vicinity of Salt Lake and proceeded ahead to California from whence he subsequently took a prominent part in the rescue of the survivors, including the members of his own family.

Reed was an able and upright man. Regardless of the merits of the case which resulted in his banishment and the subsequent identification of the name "Donner" as the sole title of the expedition, and the application of that name to the trail and the historical names and monuments related thereto, the Reed family and their supporters always felt that any references should have been to the "Reed-Donner" Party rather than confined solely to the name "Donner."

It is 28 years since the Pioneer (Donner) Monument was dedicated. On March 22, 1922, military aviators, piloting four airplanes, crossed the Sierras for the first time, flying from Mather Field to Reno in one and one-half hours.

Following is an extract from a contemporary newspaper account of the event:

## "THE PAST—THE PRESENT"

"The route traversed by the big airplanes today is not far from the one along which the early Californians entered the State during the days of the gold rush.

"Wagon trains often spent more than a week in crossing the mountains to the Sacramento Valley over the crude roads of those days. Of recent years with improved road conditions the trip from Sacramento to Carson has consumed three days for freight teams. The one way trip between the two cities has been a good day's work for the ordinary automobile."

Compare the above with today's schedule of less than four hours auto and one hour by plane.



State of California  
EARL WARREN, Governor

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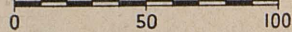
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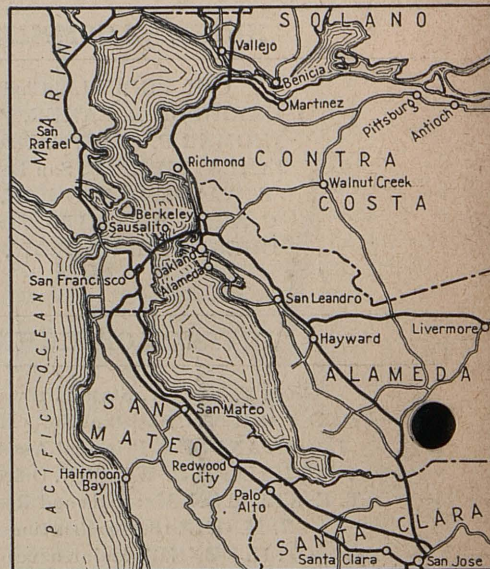
SCALE IN MILES



~ LEGEND ~

Primary Routes   
Secondary Routes   
Proposed Routes

SAN FRANCISCO AND VICINITY



LOS ANGELES AND VICINITY



centimeters 10  
D50 Illuminant, 2 degree observer  
Density  
Golden Thread  
Munsell Color Services Lab  
Colors by Munsell Color Services Lab

1	2	3	4	5	6	7	8	9	10	11(A)	12	13	14	15
38.12	65.43	49.87	44.26	55.56	70.82	53.51	39.92	52.24	97.06	92.02	87.34	82.14	72.08	62.15
13.24	18.11	16.11	14.34	13.80	9.80	11.99	13.06	11.71	-0.43	-0.37	-0.16	-0.09	0.28	0.19
15.07	18.72	-22.29	22.85	-24.49	-0.35	59.60	-46.07	18.51	1.13	0.23	0.21	0.43	0.38	0.19
0.02	0.04	0.09	0.15	0.22	0.36	0.51	0.75	0.98	1.24	1.67	2.04	2.42		

inches 4  
D50 Illuminant, 2 degree observer