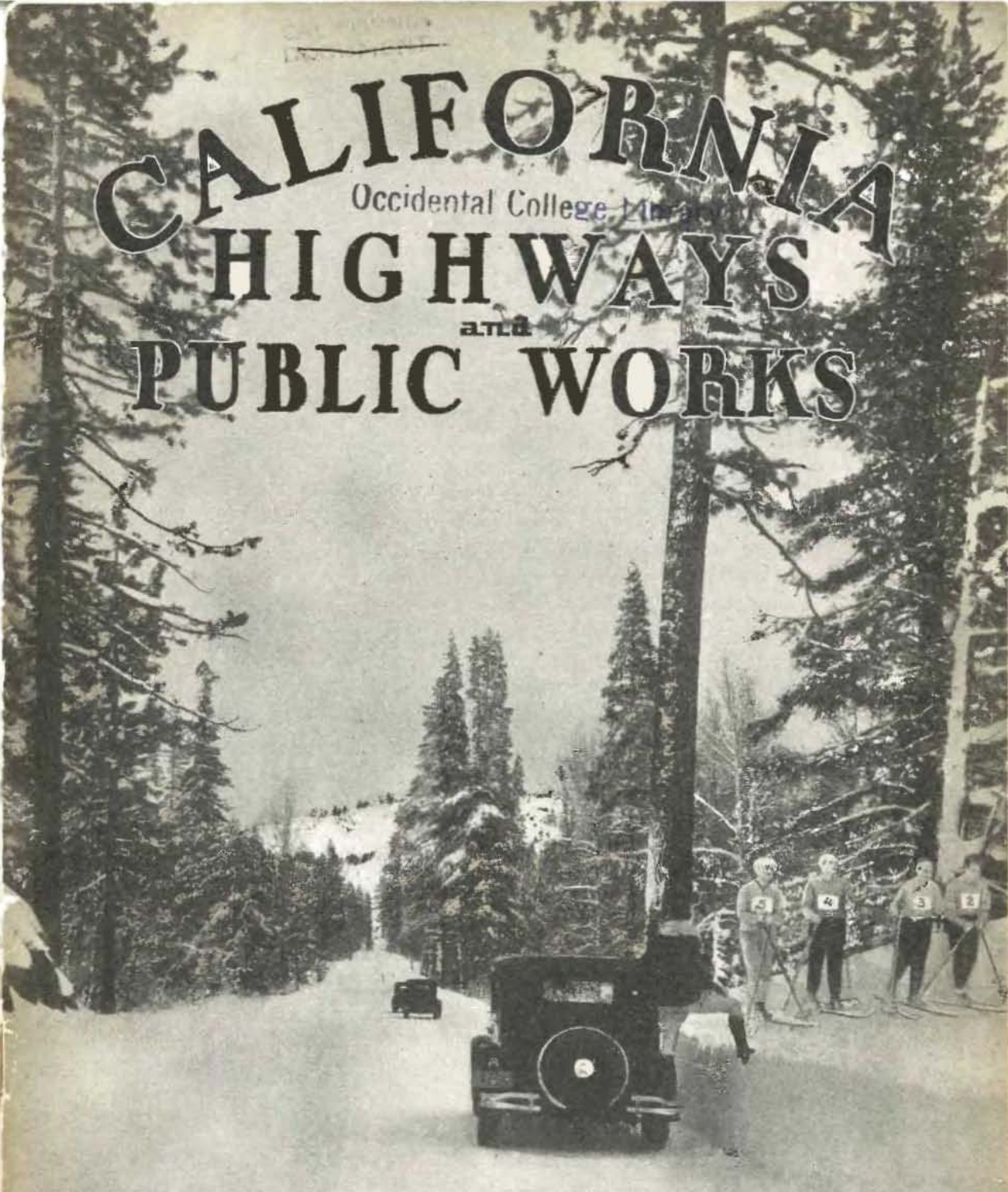


# CALIFORNIA Occidental College Mt. HIGHWAYS and PUBLIC WORKS



A California Winter Sports Highway  
State Route 37 - Auburn to Truckee

Official Journal of the Department of Public Works

JAN.-FEB. State of California

1933

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## Table of Contents



|   | Page     |
|---|----------|
| Highway Budget Projects for Next Biennium Total \$61,700,000.....               | 1        |
| Highway Dollar Spreading to 50,000 Californians Through 12,000<br>Workers ..... | 2        |
| By Morgan Keaton, Assistant Deputy Director of Public Works                     |          |
| Illustrations of Highway Improvements by Relief Quota Crews.....                | 3        |
| Piru Creek Moved Into New Concrete Channel.....                                 | 4        |
| By R. C. Myers, Assistant Engineer, Dist. VII                                   |          |
| Channel Change Operations Pictured.....   | 5        |
| Snow Removal Pays Dividends to Motorists and State.....                         | 6        |
| By T. H. Dennis, Maintenance Engineer   |          |
| Scenes of Snow Removal Operations.....  | 7        |
| Dr. W. W. Barham Appointed Highway Commissioner—Illustrated....                 | 8        |
| Gasoline Tax Revenues Continue Downward Trend—Illustrated.....                  | 9        |
| National State Highway Body Confirms Value of Relief Work.....                  | 10       |
| By George T. McCoy, Principal Assistant Engineer                                |          |
| Highway and Parks Departments Saving Coast Areas.....                           | 12       |
| By Wm. E. Colby Chairman, California State Park Commission                      |          |
| Views of Recently Acquired Coast Parks.....                                     | 13       |
| \$100,000 U. S. Participation Approved for River Bank Protection....            | 14       |
| By R. L. Jones, Deputy State Engineer   |          |
| Eight Major Highway Projects Advertised.....                                    | 16       |
| Tabulation of December Highway Projects.....                                    | 17       |
| Facsimile of Unique New Years Greeting.....                                     | 19       |
| Labor Gets 91 Per Cent of Every \$1,000 for Concrete Paving.....                | 20       |
| Report of State Engineer on Water Resources.....                                | 25       |
| Water Applications and Permits.....   | 28-29    |
| Vital Statistics on Dam Control.....  | 30       |
| Details of Projects in 1933-35 Biennial Budget.....                             | 31 to 36 |

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# Highway Commission Sets \$61,700,000 Total for 1933-35 Biennial Budget

Proposed Improvements Include 77 Projects Covering  
360 Miles in North Section of State and 74  
Totalling 510 Miles in the South

**T**HE Biennial State highway budget recommending expenditures of \$61,700,000 on the State highway system for the ensuing two fiscal years, has been completed by the California Highway Commission and presented to Governor Rolph. It covers the biennial period from July 1, 1933, to June 30, 1935.

The budget provides for contemplated expenditures from funds which it is estimated will become available in the next biennium, for all State highway purposes including construction, reconstruction, maintenance, purchase of right of way, engineering and administrative cost.

The distribution of the money between the northern and southern counties, between primary and secondary highways, is in accordance with the provisions of the Breed Act.

## 151 PROJECTS SCHEDULED

Major projects proposed for construction and reconstruction provide for improvement of 77 projects in the north section of the State and 74 projects in the south section of the State. These projects lie on 28 different routes in the north and 21 different routes in the south. The total mileage involved in these projects is 360 miles in the north and 510 miles in the south.

Of the mileage involved in the north, 130 miles are financed from the reconstruction fund and 230 miles from construction and general funds. Of the mileage in the south to be improved, 265 miles are financed from reconstruction funds and 245 miles from construction and general funds.

Revenue in the State highway construction fund—the one-cent fuel tax, which was put into effect in 1927—is allocated 75 per cent to primary highways and 25 per cent to secondary highways. The funds for construction of primary highways are divided between the north and south sections of the State in proportion to the mileage of primary high-

ways in each section. The funds for construction on secondary highways are equally divided between the north and south sections of the State. Ten per cent of the secondary highway construction fund is appropriated by law for State cooperation in joint highway districts, and is divided in equal amounts between the north and south sections of the State.

## DIVISION OF FUNDS

Federal aid funds contributed by the Federal government constitute the highway general fund. It is available for construction and reconstruction and is divided between the north and south sections of the State in proportion to the mileage of primary highways in each section.

The Federal aid allotment from the Federal government is contingent upon appropriations made by Congress and must be earned by expenditure of State funds on the 7 per cent Federal Aid Highway System. It is expected that California will receive about \$8,000,000 in Federal aid during the next biennium.

As provided in the Breed Act of 1927, the basis for expenditures for construction and reconstruction of primary highways in the north and south sections of the State is the mileage of adopted primary highways in the respective sections. In the north section primary mileage is 2341 miles and in the south section of the State 1920 miles. This gives a ratio of 54.9 per cent for the northern counties and 45.1 per cent for the southern counties.

## SECONDARY HIGHWAYS

In the secondary highway system of the State, there are 1941 miles in the north and 1147 miles in the south. Three hundred and forty-five miles of secondary highways are recommended for inclusion at this session of the Legislature. Maintenance of this additional mileage has been provided for in the 85th and 86th fiscal year budget.

(Continued on page 31)

# Highway Dollar Spreading to 50,000 Californians Through 12,000 Workers

By MORGAN KEATON, Assistant Deputy Director of Public Works

**R**OAD construction in the past three years has taken a large place in the Nation's activities and has in a large measure helped to provide employment for skilled and unskilled labor which machinery has partially displaced in other industries.

Road construction in California has amended itself to relieve unemployment for the State as has no other industry and the State in turn has received full value for every dollar expended in highway betterments and improvements.

The State is now carrying out its second winter program for unemployment relief through the Department of Public Works. At the present time highway dollars are taking care of approximately 50,000 people in California through the money earned by the 12,000 workers. The latter represent contractors' crews engaged on State jobs, family men in relief quota maintenance crews and others regularly employed on highway work in all parts of the State. Through the hands of these people the highway dollar is divided among an ever-widening circle of merchants, manufacturers, farmers and their families and employees.

ORDERED BY GOVERNOR

Early in the season Governor James Rolph, Jr., gave strict orders that only people with a number of dependents should be eligible for highway relief employment work, which policy has been strictly adhered to by the Department of Public Works.

For this winter of 1932 and 1933 an appropriation of \$1,850,000 has been made to date to carry on a relief program similar to the work of last winter. Of this total \$300,000 was allotted to the Department of National Resources for the employment of single men

on highway protective work in forest camps established throughout the State; \$1,430,000 has been devoted to relief employment for family men on three-day-a-week work at \$4.00 per day throughout our highway districts, and \$120,000 is being used for the Arroyo Seco Camp in Los Angeles County, where 300 single men are now securing clothing, shelter and subsistence in return for six hours per day work.

At the present time there are employed on the three-day-a-week maintenance work about 3500 men from the relief quotas and before the season closes a total of some 4500 heads of families will have been aided.



MORGAN KEATON

#### NEED MUCH GREATER

This grand total is not as great as that of the previous year because the appropriation is smaller by \$416,070. However, the need this winter has been even greater than that of the last two previous winters. Therefore, it has been more difficult to select the most needy for this employment.

The average number of dependents this winter will run between four and five as compared with the average number of dependents last year which ran about three to a family. This means that more people are actually being directly benefited on less funds than during the previous period.

The work of our maintenance crews has accordingly been expanded to take care of twice the number of employees at hand labor as would have been used in ordinary times, in order to give the largest possible spread of employment to heads of families properly selected for the work.

#### FINE COOPERATION

The selection of the successful applicants for this relief work has been due to the splen-

(Continued on page 18)



**VALUE RECEIVED** in permanent highway improvements made by hand labor on maintenance quotas under the unemployment relief program of the Department of Public Works is illustrated in the above series of photographs depicting the kind of work the pick and shovel crews are doing. No 1 shows a slope cut back to "daylight" a curve with shoulder graded and graveled. In No. 2 are shown rock border gutters nicely placed at foot of steep slopes. No. 3—Crews at work cleaning slopes of loose material preparatory to widening operations. No. 4—Excavating boulders from roadside embankment to permit extending right-of-way. No. 5—Constructing rock retaining wall for protection from scour at a point where drainage enters the right-of-way. No. 6—An extensive widening project involving grading of shoulders and constructing of protective rock walls.

# Piru Creek Forced to 'Zoom' 60 Feet Out of Huge New Concrete Channel

By R. C. MYERS, Assistant Engineer—District VII

**A** VERY interesting example of one of the many problems confronting the highway engineer in making new locations across rugged, mountainous country, is a major channel change in Piru Creek Gorge on the Alternate Ridge Route now under construction. This channel change is located between French Flat and Liebre Creek, or about 13 miles from Castaic School, the southern end of the project. The drainage area upstream at this point totals about 300 square miles of mountainous territory, so that in times of heavy rainfall, floods of considerable magnitude may be expected.

The location along this portion of the new route follows through Piru Creek Gorge, the lowest natural pass through the territory on the logical line for the highway.

The new route is to be a high speed highway built on modern standards of alignment and grade, with 1000 ft. minimum radius for curves and a 6% compensated maximum grade. In following the devious course of Piru Creek it is necessary to cross and recross it several times in order to avoid making any but very gradual curves.

## OBVIATES TWO BRIDGES

The located line crosses the channel of Piru Creek at two places about 1900 feet apart, where the stream makes a sharp turn. The most obvious procedure would have been to build a bridge at each location where the highway is to cross the stream bed. Another solution was to change the course of the stream by cutting through a point around which the stream ran.

It was evident that there would be several serious difficulties encountered if the channel change were adopted instead of the construction of the two bridges. A cut running up to 75 feet in depth would be necessary, involving the removal of 118,000 cubic yards of earth and rock.

With the stream channel shortened considerably by the change, a much higher velocity would be attained by the water than in the old stream bed. As the new roadway embankment would be alongside this new channel, it was apparent that in times of high water the

embankment would be undercut and seriously damaged unless some means were provided for controlling the erosion.

The stream flow is only a few second-feet most of the year, but in years when there is heavy snowfall, it reaches torrential proportions in the spring months. Huge boulders are rolled down the stream bed.

## COST PROBLEM INVOLVED

A new channel must necessarily be lined with concrete of sufficient thickness and sufficiently reinforced by steel bars to withstand the action of boulders. It would also have to have a carrying capacity sufficient to carry the largest flow of water that could possibly be expected in this creek.

With these requirements in mind, the job for the engineers was to design and carefully estimate the cost of the channel change and compare the cost of this solution of the problem with the cost of constructing two bridges with the necessary bank protection at the approaches.

A concrete-lined channel varying from 40 feet to 90 feet in width on the bottom and 25 feet deep, with a carrying capacity of 40,000 cubic feet of water per second, was designed. The bottom and sides were designed with concrete 1 foot thick for a distance of 16 feet up from the bottom. The sides tapered to a thickness of 6 inches at the top.

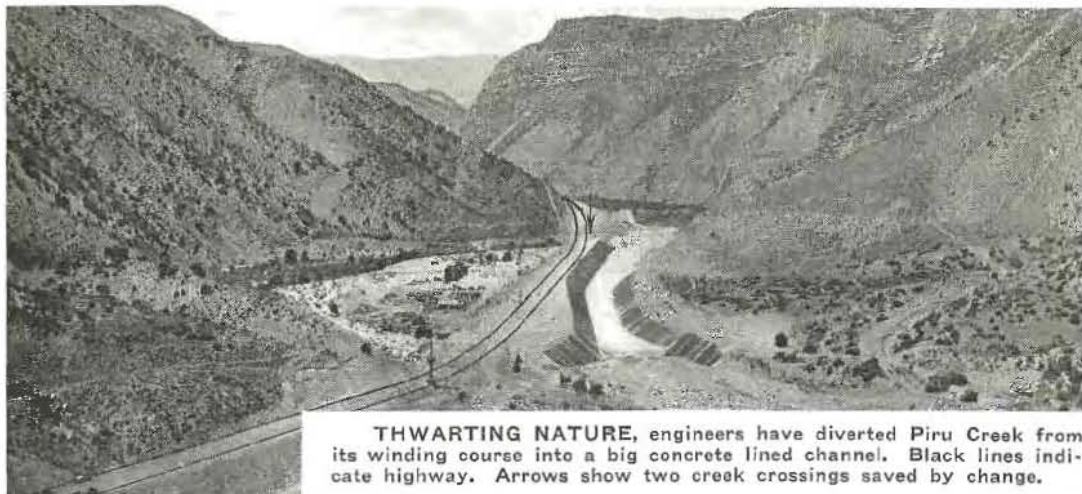
A careful estimate of the cost of this construction was made and also of the plan in which two bridges would be constructed. It was found by comparing these estimates that a saving of about \$75,000 could be effected by constructing the channel change. This plan was accordingly adopted.

Power shovels were used in excavating the new channel, and the excavated material was hauled in trucks to make the nearby highway embankments.

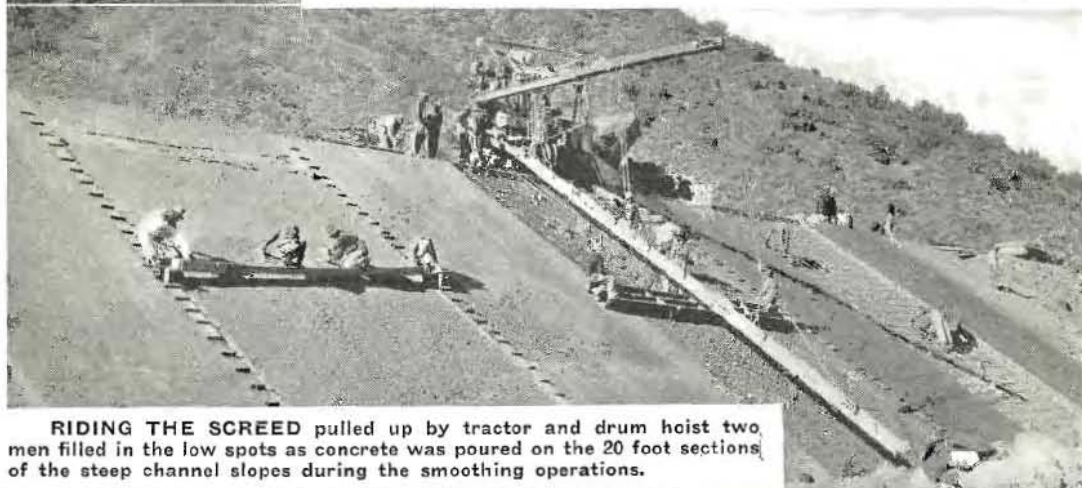
## NOVEL SMOOTHING METHOD

Concrete was poured on the channel slopes in 20-foot sections. It was smoothed by a heavy screed which was pulled up the slope very slowly by means of a tractor and drum hoist. Two men would ride this screed, filling

(Continued on page 18)



**THWARTING NATURE**, engineers have diverted Piru Creek from its winding course into a big concrete lined channel. Black lines indicate highway. Arrows show two creek crossings saved by change.



**RIDING THE SCREED** pulled up by tractor and drum hoist two men filled in the low spots as concrete was poured on the 20 foot sections of the steep channel slopes during the smoothing operations.



**HERE SHE ZOOMS**—Workmen are constructing a heavily reinforced concrete take-off at the outlet end of the concrete channel that will force the water to make an aerial leap of sixty feet to prevent undercutting. The "Zoom" has a  $12\frac{1}{2}$  degree upward angle to a heavy cut-off wall.

# Snow Removal Pays in Savings to Traffic and Increased Fuel Revenue

By T. H. DENNIS, State Maintenance Engineer

**D**URING the winter of 1931-32, snow was removed on 2047 miles of State highways at a cost of \$285,600, or approximately 43 cents for each of the 662,500 machines using these roads during that period. Assuming each machine traveled 150 miles making 14.5 miles to the gallon of gasoline—averages determined in the joint survey conducted by the United States Bureau of Public Roads and the Division of Highways—then the return of 41½ cents per machine in gas tax almost equalled the cost of removal.

That business in general profited by this removal is apparent from the March, 1932 report of the California State Chamber of Commerce, which showed that \$1,502,307 was expended by motorists, for transportation alone, to the winter sports areas.

Since the mileage cleared in recreational areas was but 20 per cent of the total, the complete expenditure directly attributable to an open road might conservatively be expanded to several times the Chamber's figures.

## DONNER SUMMIT RECORD

A concrete example of direct savings to the motorists is exemplified in the clearing of the Donner Summit. This historic summit, the barrier to the ill-fated Donner Party, reaches an elevation of 7200 feet. Records of the past 59 years show an average yearly snow fall of 34 feet, a maximum of 65 feet, and a minimum of 12 feet. Last year we moved 480 inches of snow on this road at a cost of \$70,887, or 94 cents for each of the 75,800 vehicles crossing the summit.

If we accept the United States Bureau of Public Roads estimate of 2.27 occupants per car, then over 172,000 individuals secured direct benefit from this expenditure. The railroad fare from Sacramento to Truckee is

\$5.06. If only one-quarter of the people who used the road made the trip from necessity, a total of \$217,663 would have been expended for railroad fare, and if it had been necessary to move one-tenth of the vehicles from Truckee to Sacramento by the so-called "railroad ferry" at \$15.00 per car, an additional \$113,700 would have been expended. Since the cost of keeping the summit open was \$70,887, traffic has evidently been greatly benefited by this expenditure.



T. H. DENNIS

Snow removal programs are usually planned in summer, since the special equipment required is seldom carried in stock, and must be ordered in early fall to insure timely delivery. As a consequence such programs are without the benefit of definite knowledge of the severity or mildness of the coming winter.

## THOROUGHLY PREPARED

The end of this December, therefore, found us completely organized, and contrary to last, having experienced few if any major demands on the personnel and equipment provided. At the conclusion of last December 273 inches of snow had fallen on Donner Summit, 178 inches of which remained on the ground; while in the same period this year, but 80 inches had fallen, with 30 inches remaining as a pack.

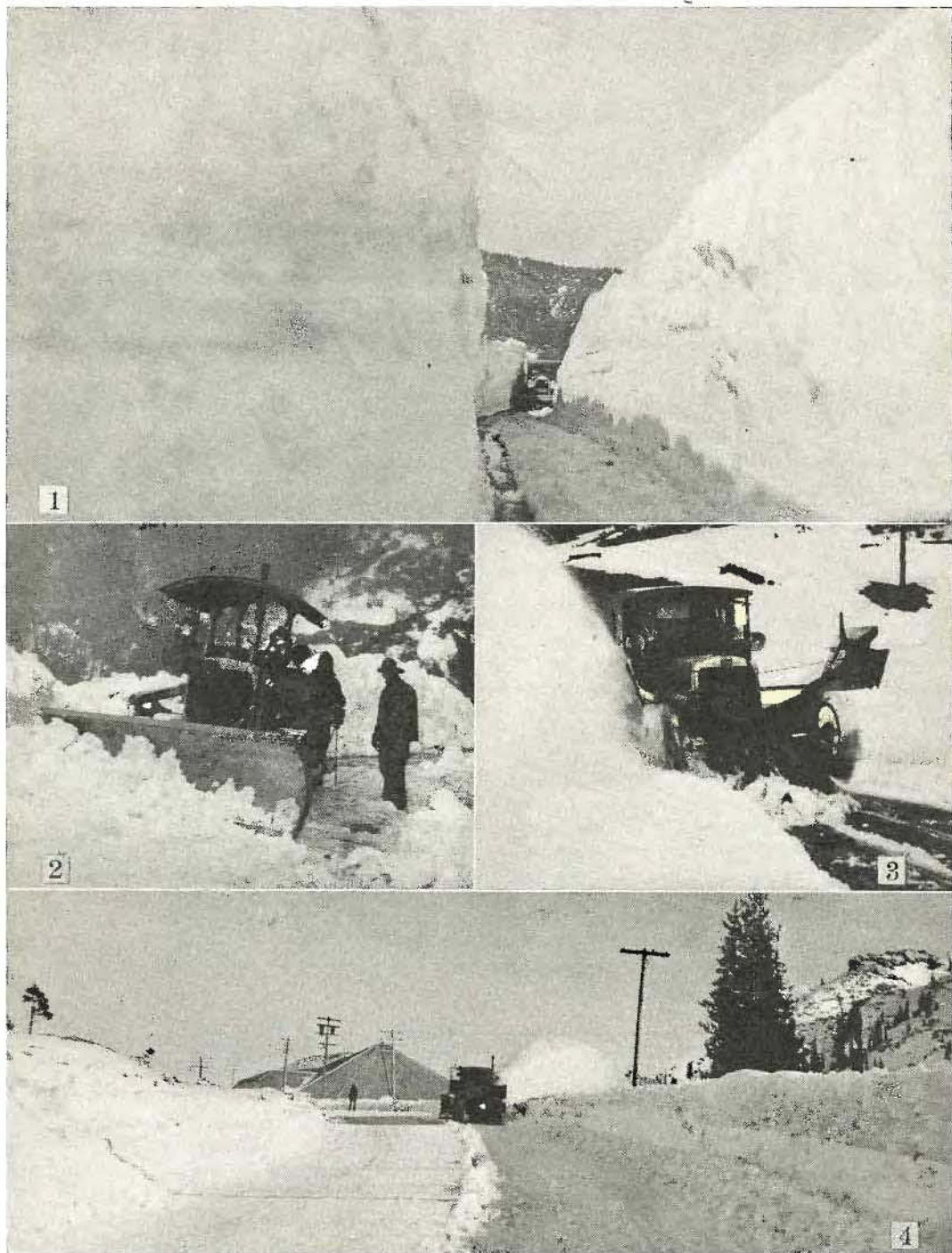
Nevertheless, thorough preparation is necessary as human safety is involved, and success or failure on a particular project may be jeopardized by the lack, at the critical time, of one essential piece of equipment. Any sound plan, therefore, must anticipate at least normal demands. To provide less is to create a false confidence in our efforts, which can not be backed by performance.

## ROUTES CLEARED

Last year, snow was removed on the following State routes, work on certain portions

(Continued on page 21)





WHEN SPRING COMES in the higher Sierra regions the deep snow pack has always presented a formidable and expensive problem. Experience proves it pays to keep the heavy travelled highways open. No. 1 shows the situation on Donner Summit in the Spring of 1929 before modern snow fighting equipment was kept on the job. No. 2—A tractor operated push plow at work on Cajon Pass in Southern California. No. 3—A truck rotary clearing the Crest Route in the San Bernardino Mountains. No. 4 is another view of Donner Summit taken last winter showing how the powerful modern rotary plows, maintained a wide, cleared highway for traffic throughout the winter saving thousands of dollars for motorists.

## Dr. W. W. Barham of Yreka Appointed To Fill Highway Commission Vacancy

**D**R. WILLIAM WIRT BARHAM of Yreka, Siskiyou County, famed in highway history of California as the man who built the first mile of paved highway in the State under the 1915 bond act, was appointed a member of the California Highway Commission on December 20th last by Governor James Rolph, Jr. He fills the vacancy on the commission caused by the resignation of Earl Lee Kelly to become director of the Department of Public Works.

Dr. Barham attended his first meeting as a member of the commission on January 10th and was cordially welcomed and duly installed in office by his fellow commissioners.

### SECRETARY TO CONGRESSMAN

The new commissioner is a native Californian, born in Oakland. The son of former Congressman John A. Barham, he got an early knowledge of official life when he went to Washington, D. C., as secretary to his father soon after graduating from high school in Santa Rosa. While in the national capital he attended the George Washington University and later graduated from the University of Maryland with the degree of Doctor of Dental Surgery.

Returning to Santa Rosa, he practiced dentistry three years in that city and moved to Yreka in 1905 where he established a very successful practice and became active in the political and civil affairs of the community. He was elected mayor of the city and served in that office for twelve years.

### SECURED NEW HIGHWAY

It was about this time that Siskiyou county played an important part in the highway annals of the State by promising the original highway commission that if the Pacific Highway was routed through the county, the taxpayers would furnish all rights of way and build the necessary bridges.

Mayor Dr. Barham followed up this enterprising precedent by starting work on the first mile of pavement to secure the routing of the highway through the city of Yreka.

Becoming interested in banking, Dr. Barham was one of the organizers of the First National Bank of Yreka and was elected its



Dr. W. W. BARHAM

president, an office he is now holding. He has been prominent as a banker in Yreka for many years.

As chairman of the Republican County Committee he has long taken an active part in the political affairs of city, county and State.

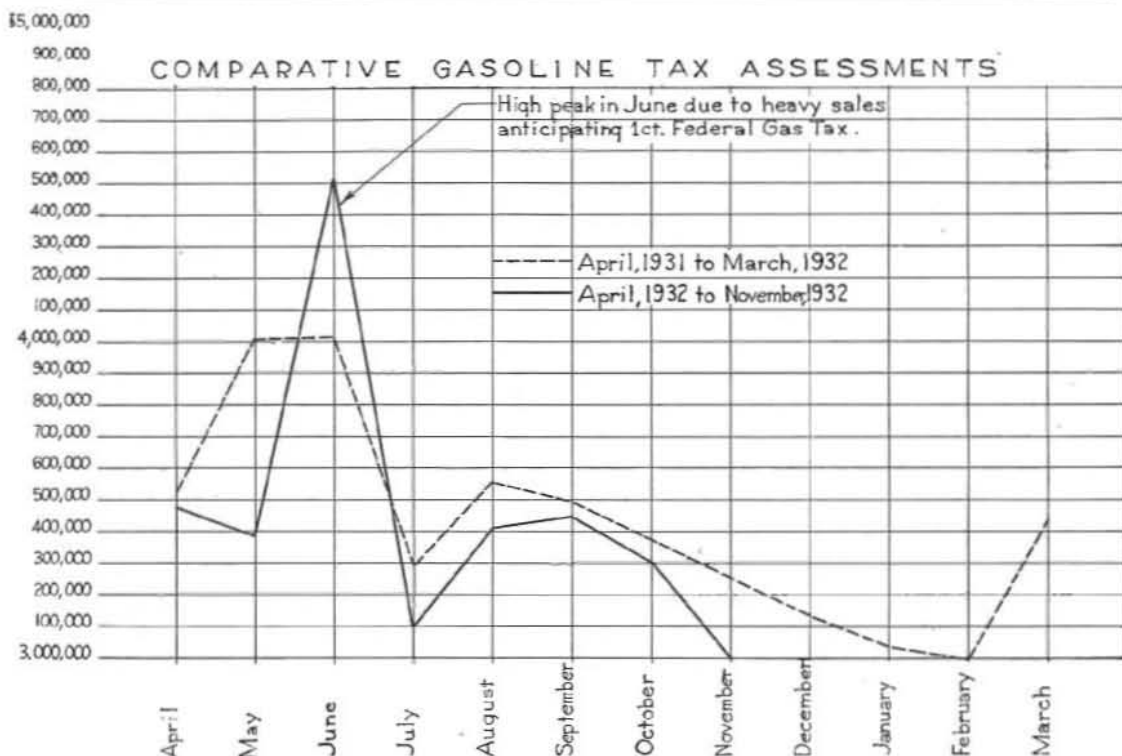
Dr. Barham is married and has one grown son.

### HEADS DISTRICT BUREAU

Appointment of I. L. Swearingen, Los Angeles, to the position of District Supervisor for the State Bureau of Contractors' Registration in the Southern California District, embracing 13 counties, has been announced by Col. Carlos W. Huntington, registrar of contractors.

Swearingen, who has been actively engaged in the contracting business in Los Angeles for more than 10 years, will succeed the late Hal G. Stiles. He is a world war veteran and former Commander of Post 345 of the American Legion.

## Gasoline Tax Continues to Shrink



**G**ASOLINE tax assessments for the twelve months of 1932 as shown by complete returns for the year registered a decrease of \$1,454,554 compared with the like period of 1931.

The receipts for 1932 totaled \$40,171,338 as against \$41,625,892.

The trend of recent months indicate the revenues from this source are continuing to show a loss and that the rate of decrease up until December was steadily increasing. The accompanying chart showing assessments for the comparative months of 1931 and 1932 illustrates this downward trend and indicates that if the present rate of decrease is projected into the next biennium a serious reduction in gasoline tax revenue will result.

It is not possible to make monthly comparisons prior to April 1, 1931 when the law providing for monthly assessments instead of quarterly returns went into effect but the first quarter of 1932 showed a loss of \$512,322 compared with the 1931 period.

A comparison of the eight months beginning April 1, 1932 with the 1931 figures shows a decrease in assessments levied for that period of \$890,894.19, or slightly over 3 per cent.

Except for the month of June 1932 which showed an increase due to large distributions in that month by wholesalers in order to avoid the Federal tax of 1 cent which became effective in July, every month of 1932 shows a steady decrease in assessment returns.

The receipts for November, especially, reveal a marked downward trend with a decrease of \$252,430.70 compared with November 1931, representing a drop of 7.7 per cent.

The December drop however shows a halt in the rather precipitous decline registered in November. The revenues for December 1932 amounted to \$3,079,245 compared with \$3,130,587 in 1931 reducing the rate of decrease to 3.49 per cent.

Chart records show that the downward trend may be expected to continue until spring.

# National State Highway Body Finds Full Value Returned in Relief Work

By G. T. McCOY, Principal Assistant Engineer

**R**EPRESENTATIVES from the State highway organizations of the forty-eight States, Hawaii and the Bureau of Public Roads met at Washington for the eighteenth annual meeting of the American Association of State Highway Officials, on November 15th, 16th and 17th last.

Mr. Harry A. Hopkins, chairman of the California Highway Commission, and the writer attended the meetings as representatives of the State highway organization of California.

It was fitting that, in the year of the bicentennial celebration of the birth of George Washington, this national organization of highway builders should meet in the Capitol City of the Nation and should share in the bicentennial ceremonies by the dedication of the Mt. Vernon Memorial Highway, recently completed between Washington and Mt. Vernon. This new boulevard represents the last word in modern highway construction and serves as an appropriate memorial to that great American statesman and soldier, who also was a pioneer road builder, surveyor and engineer—George Washington.

#### IN RETROSPECT

It is not the purpose of this brief article to provide a detailed report of the addresses and conference proceedings of the meeting but rather, in retrospect and with proper perspective, to present the trends of opinion as expressed by the speakers of the meeting.

The sessions of this eighteenth annual meeting opened with Thomas H. MacDonald, chief of the Bureau of Public Roads of the United States Department of Agriculture, as host, who delivered the address of welcome. Mr. MacDonald complimented the Highway Departments of the various States on the

rapidity with which they had cooperated with the Federal Government in getting under way emergency relief contracts for State highway work in both 1931 and 1932.

In two successive years, the State Highway Departments each year let to contract work covering construction on more than 7000 miles of highways, thereby providing employment to thousands of men on the work throughout the Nation and to thousands more in the manufacture and transportation of materials used in the work.

Mr. MacDonald expressed himself as favoring this form of relief to unemployment during emergencies such as have existed during the past two years, as the State Highway Departments provide an adequate set-up for quickly and efficiently putting the work in motion and when completed the improvement is a material asset to the wealth of the Nation.



G. T. McCOY

#### HYDE SOUNDS WARNING

The second speaker was the Honorable Arthur M. Hyde, Secretary of the United States Department of Agriculture. While Secretary Hyde's address was on "Agriculture and Highways," he spoke of the three-fold problem which con-

fronts Highway Departments today: (1) decreased annual highway income; (2) large capital investments involving heavy maintenance obligations; (3) incompleteness of major road systems with a need for improvement to tremendous mileages of secondary and more strictly rural roads.

To deal with these problems, Secretary Hyde advocated the need of greater critical research and review into both the economic and physical aspects of highway improvement with the resultant fashioning of new methods and policies which will adequately cope with

## Uniform Road Standards Obtain in U.S.

(Continued from preceding page)

the changed conditions and permit continued highway development so important to the Nation.

In this respect Secretary Hyde deplored any tendency of neglecting maintenance of highways, not only in the technical sense, but also in the sense of continuous improvement consistent with traffic needs. He sounded a warning against the increase in mileage of State highway systems beyond the ability of the States to collect revenue for proper construction and maintenance, emphasizing the fact that there is a limit to the taxing power of the State for this purpose.

### FULL TAX DIVERSION

He also warned against diversion of motor vehicle fees and motor fuel taxes to other than those of State highway purposes, as diversion of these funds saddles upon the motorist an unequitable burden in the support of State Government and activities.

In the disbursement of available State highway funds Secretary Hyde placed the obligations for use in the following order: (1) debt service; (2) adequate maintenance; (3) necessary reconstruction of trunk highways; and (4) new construction.

Mr. Hyde further recommended complete transport surveys in each State with reasonable regulation and taxation of bus and truck lines and stated it was his opinion that, with the return of normal conditions, proper economic relations between railroad and highway transport would obtain.

On the afternoon of the fifteenth, the members of the association motored down the Mt. Vernon Memorial Highway and participated in the dedicatory ceremonies held at Mt. Vernon under the auspices of the United States George Washington Bicentennial Commission.

O. S. Warden, chairman of the State Highway Commission of Montana, opened the meeting on November 16, speaking on "Road Planning as Carried Forward by the State Highway Department." In reviewing the varying methods followed by different States in setting up their State road systems and State highway organizations in the early days of modern highway development, Mr. Warden drew attention to the continuous movement by which the many different procedures advanced toward the uniform methods and standards which now obtain throughout the entire nation.

### IN PARTIAL CONTROL

For proper planning and highway development, Mr. Warden stressed the necessity of the control of allocation of funds being invested in the State Highway Commissions, that the work be carried on in an orderly and impartial manner for the best interests of the system as a whole. Mr. Warden expressed as his opinion that, if the same care in planning, foresight, ability and honesty had been applied to all private business in the manner that these functions are practiced by the various State Highway Departments this country would now be in a much more favorable economic condition.

He emphasized the need of further research as an aid to planning and to proper consideration of location

and construction that highways may meet the demands of the future.

Mr. Warden paid tribute to California and Oregon for their leadership in the development of low-cost, oil-treated roads which have proven such a boon to Western States with large road mileages and limited revenue. He spoke of the value of snow removal in opening communication in districts long isolated during winter months and of the development of modern snow removal equipment which has made possible this phase of highway maintenance.

### ORDERLY PROCEDURE DEMANDED

Mr. Warden also emphasized the dangers of diversion of highway funds for general State purposes stating that every dollar diverted from highway purposes places in jeopardy the capital investment already made. He noted the sentiment of representatives of the United States Chamber of Commerce at the 1932 convention, held in San Francisco, and at an economic conference of intermountain States at Colorado Springs which, while voicing an insistent demand for the reduction of general taxes, demanded a continued orderly procedure of highway planning and construction as a great and wholesome policy.

Mr. Warden was followed by the Honorable Roy D. Chapin, Secretary of the United States Department of Commerce, who spoke on "The Road Users Obligations and Rights in the Financing of Highways." Secretary Chapin stated the obligation of road users in two sentences:

- (1) Each should pay his fair share of cost of development.
- (2) Each should use the road with due regard to the safety of all others on the highway.

As to who the road users are, Mr. Chapin pointed out that while society as a whole is dependent upon the highways for the efficacy of modern schools, hospitals, suburban development, interstate commerce, postal service and even national defense, the special interest is that of the automobile owner.

### NOT TAX TARGET

Mr. Chapin laid particular stress upon the inalienable right of the man who uses the highways and who has met his obligations to demand that his vehicle shall not be singled out as a tax medium for the payment of general taxes.

In commenting upon the cry which is frequently raised for the "good old days," Mr. Chapin related his personal experience of driving the first automobile between Chicago and New York, requiring seven days to navigate the mud-bound roads of Indiana, Ohio, Pennsylvania, and New York. He doubted if anyone really desired the return of the so-called "good old days."

Grover C. Dillman, State Highway Commissioner of Michigan, then addressed the meeting on "Road Building as an Agency of Employment During Depression." Mr. Dillman enlarged upon and developed this phase of relief work, which has been touched upon by Mr. MacDonald and other speakers.

He convinced the members of the Association that the building of highways was a sound and

(Continued on page 22)

## Highway and Park Departments Join In Saving Coast Areas for Public Use

By WM. E. COLBY, Chairman, California State Park Commission

**I**T is a truism that California's scenery and opportunities for outdoor life are among her foremost attractions. And it is equally true, on the one hand, that California's parks are rendered more valuable to the people because they are reached by splendid highways; and on the other, that California's highways are enhanced in value because they lead through and into regions of rare scenic charm such as we are preserving in our parks.



WM. E. COLBY

The interests of highways and parks are closely inter-related. This has been recognized by the California State Highway Commission, and their wholehearted cooperation in assisting in our program has been of great benefit to the Division of Parks.

Between 1928 and 1932, the number of State parks in California has increased from 10 to 32, and the area from 13,574 acres to over 67,000 acres. They represent a value of close to \$12,000,000. This rapid growth of the State Park System, made possible by the State Park Bond Issue voted in 1928, and the private and local gifts which have matched State funds, has taxed the resources made available for administering the parks and the ingenuity of its administrative offices. The bond issue made no provision for taking care of the parks after they were acquired. That was left to legislative appropriation.

### UPKEEP OF ROADS

One of the very important phases of the park administration is the maintenance of roads within the parks. Fortunately it is provided by law that the State Division of Highways is charged with the upkeep of these park roads; but the wholehearted and thorough manner in which the highway authorities have carried out the provisions of the law in this respect has at once relieved

greatly the burdens of the Park Commission, and increased the value of our parks for public use.

The former toll road to summit of Mount Diablo, for instance, was impassible for long stretches during wet weather. Since it has been taken into the State Park System, it has been graded and surfaced by the Division of Highways in such excellent fashion that the trip to this spectacular peak can be enjoyed by the motorist at practically any time in the year. At the Big Basin, and in the Humboldt State Redwood Park, numerous side roads leading from the highway into the various groves and camp grounds have similarly been kept up for the use of visitors to these parks. There are many other instances in our parks.

In another important way we have enjoyed the cooperation of the Division of Highways, and that is in respect to the relocation of main highways that happen to extend through State park lands. Of necessity there is some divergence between the point of view of the engineer planning a trunk highway for the safety and convenience of the public, and the park administrator whose object is primarily to preserve the beauty of the landscape for public enjoyment. We have been fortunate in that where, for this reason, differences of opinion have arisen, it has been possible to effect a compromise satisfactory to both points of view.

### FINE REDWOODS SAVED

A case in point is the new location recommended for that portion of the Redwood Highway which runs for some 7 miles through the Del Norte Coast Park. This area of 2500 acres consisting of a heavy stand of giant redwoods covering steep slopes extending to the very shore of the Pacific Ocean, is one of the most spectacular of our parks. It was because of its unique scenic qualities that private individuals, through the Save-the-Redwoods League, contributed one-half of its cost to match State bond funds.

Because of the rough and broken nature of the terrain, the present highway, built under the first highway bond issue, is narrow, crooked and hazardous for swift modern travel. The proposal to realign it according



**NO LONGER PADLOCKED,** Point Lobos, a scenic beauty spot of rare charm on the Carmel-San Simeon coast from which the public was barred except on payment of a fee, has been acquired as a State park and made more accessible by realignment of the State highway.



**PRO BONO PUBLICO,** this splendid beach and lagoon area comprising two miles of seacoast at the mouth of San Simeon Creek in San Luis Obispo County has been established as a State park through the joint efforts of the Division of Highways and the Park Commission.

to present-day standards of curvature and width implied of necessity considerable destruction of scenic values because of the many fine redwoods that would have to be sacrificed and because of the heavy cuts and fills.

Public interest, however, required a modern highway, and after many conferences and painstaking study by both the highway and the park interests, a plan was worked out for a totally different route, following

the general course of the old county road of twenty years ago, following the ridge at the eastern edge of the park, involving much less necessary destruction, as well as about half the cost of the previously proposed route, and leaving the present highway intact as a park road for more leisurely travel.

#### LESS COSTLY ROUTE

Thus the willingness of the Division of Highways to join with the Park Commission

(Continued on page 21)

# \$100,000 Annual Participation by U. S. Approved for River Bank Protection

By R. L. JONES, Deputy State Engineer

**A**S THE result of a conference between Federal and State officials in Washington, D. C., June 27th last, approval has been given by Major General Lytle Brown, Chief of Engineers, U. S. Army, to a comprehensive program of bank protection on the Sacramento River and its tributaries, to be carried out jointly by the State and Federal governments. Attendance at the conference included General Brown; Colonel Thomas M. Robins, Division Engineer Pacific Division; Congressman C. F. Curry; State Engineer Edward Hyatt, and Chief Engineer State Reclamation Board A. M. Barton—the last two named being in Washington in connection with other matters before the War Department.

The program has for its objective the complete protection of the river banks with construction of permanent types, to be undertaken under a definite plan through a period of years until completed, as a feature of the maintenance of the Sacramento flood control project and of river navigation, and offers a final solution to the difficult, persistent and costly problem which has confronted the owners of leveed river front land since reclamation has been practiced on these rivers. The threat of breaks in the levees, always present during flood will eventually be removed to a large extent by the permanent protection of weak and exposed places.

Bank protection on the Sacramento River and its tributaries in the past has been performed by the State, through the State Engineer, and by reclamation districts and property owners. For many years the State has continuously supplied appropriations, applicable to all streams of the State, for river rectification, bank protection and related work, to be expended by the State Engineer.

## STATE PAID A THIRD

The work done under these appropriations has been largely in cooperation with local interests, and in recent years the proportion of the cost paid by the State has been one-third. Since July 1, 1929, such work on the part of the State has been included in the maintenance of the flood control works of the Sacramento River flood control project, in charge of the Division of Water Resources, Department of Public Works.

Since July 1, 1910, about the time the present Sacramento River flood control project was inaugurated, the total expenditure for bank protection on the Sacramento River and its tributaries, not including the Yuba River and the by-passes, has been \$1,413,240, of which the State paid \$360,870 and local interests \$1,052,370.



R. L. JONES

During these twenty-two years the average annual expenditure has been \$64,200, of which the State paid \$16,400 and local interests \$47,800. In the seven and one-half years since January 1, 1925, the average annual expenditure for bank protection has been \$73,000, the State paying \$26,900 and local interests \$46,100.

The bank protection work done in the past by the State and local interests did not follow a definite plan and program. Funds available have always been less than the requirements, which necessitated work being done as and where required in emergency. It has been almost wholly of a temporary type, constructed of materials which have a short life, such as trees, logs, timber, brush, piles, and steel cable.

## RESULTS SATISFACTORY

It may be stated in general, however, that the results obtained from the temporary types of construction have been satisfactory, except



# Erosion Filling Sacramento Channels

(Continued from preceding page)

for the need to replace about half of the structures every ten years on the average. The necessity of providing protection with the cheaper and more perishable materials has failed to accomplish permanent results commensurate with the large sums of money expended.

Had it been possible in 1910 to adopt and carry forward a program such as the one now in effect, it would have been by now largely completed with the same expenditure.

During the year passed practically no cooperative bank protection has been undertaken, due to the inability of local interests to furnish their portion of the costs. Under the proposed plan the entire cost will be defrayed by the State and Federal Government in the proportion of one-third and two-thirds, respectively. Local interests will be relieved of all cost, but must furnish the necessary right-of-way. Approximately \$100,000 will be expended in the fiscal year ending June 30, 1933, and if the program is carried fully into effect \$150,000 per year thereafter.

## PROPOSED PLAN

The main features of the plan are set forth in the following memorandum from the District Engineer, Sacramento, to the Division Engineer, Pacific Division, dated June 18, 1932, which was approved by the Chief of Engineers, on June 29, 1932:

"Memorandum to Lieut. Colonel Thomas M. Robins:

"1. A recent inspection of the condition of the banks and levees of the Sacramento River has been made by this office, in conjunction with the State authorities. This inspection has determined that at numerous locations the banks and levees are in need of immediate maintenance work, in order to preserve the levees, and prevent erosion and the consequent shoaling of the navigable channels.

"2. These levees are a part of the Flood Control Project (Senate Document No. 23, 69th Congress, 1st Session). This document provides that the United States assume the maintenance of all river channels, which would include bank protection to prevent erosion and consequent shoaling of the navigable channels; and that State authorities assume the maintenance of the levees. The document estimates the maintenance assumed by the United States at \$100,000 per annum.

"3. To date no appropriation for this maintenance has been made by the United States. The State of California has appropriated annually \$100,000 for all maintenance work connected with their share of the Flood Control Project, of which a certain portion is devoted to levee maintenance. This has amounted to about \$26,000 per annum by the State supplemented by about \$46,000 per annum contributed by local interests. Due to the small amount available for bank revetment, the majority of it done is of the emergency type and of an impermanent nature, consisting mostly of brush mats, retards, brush piles and other miscellaneous temporary types. Most of this work has been done at places where local authorities would contribute two-thirds of the necessary funds, and there has been no general plan of bank revetment ever adopted.

"4. Bank and levee maintenance pertains both to the State and the government. The former from the

point of view of maintenance of levees, with which they are charged by the Flood Control Act, and the latter from the point of view of protection of the navigable channels from bank erosion for which it is responsible. If maintenance funds are not provided for by the government in the near future, it is feared the erosion will assume serious proportions, necessitating much expenditure of funds by the government in the future.

"5. The inspection of the Sacramento and Feather rivers recently made indicates there is need of bank revetment at present as follows:

|  |             |
|--|-------------|
| Sacramento River above Colusa.....                 | 6,500 feet  |
| Sacramento River, Colusa to Sacramento             | 21,500 feet |
| Sacramento River, Sacramento to Cache Slough ..... | 62,000 feet |
| Feather River.....                                 | 4,000 feet  |
|  | 94,000 feet |

Below Cache Slough the necessary shore protection is definitely provided for by the present Flood Control Act.

It was found that bank protection was urgently needed for the following distances. These are included in the 94,000 feet indicated above.

|  |             |
|--|-------------|
| Sacramento River above Colusa.....                 | 2,100 feet  |
| Sacramento River, Colusa to Sacramento             | 5,700 feet  |
| Sacramento River, Sacramento to Cache Slough ..... | 8,200 feet  |
|  | 16,000 feet |

"6. Costs and methods of construction of various types of bank revetment have been investigated in conjunction with the State authorities. It was decided that a permanent type of bank revetment was advisable (rip-rap, concrete slab or others) and that such types could be placed at an average cost of about \$18 a linear foot. Based on the above estimates, the amount needed for immediate construction would be \$288,000, and for the complete program \$1,692,000. There will of course be a certain maintenance charge against this permanent bank revetment. It is estimated this will amount to a total of \$50,000 over a period of ten years.

## STATE PARTICIPATION

"7. The State authorities have informally stated, that in case the government would provide funds for permanent maintenance work as outlined above, that they could possibly divert \$10,000 for the fiscal year 1933 for such work. As their funds are all allocated for this period, it will be impossible to divert more until the next session of the Legislature. They have also indicated that if the government will allot funds annually, that they will ask for a much larger sum for succeeding fiscal years from the State Legislature. No specific sum has been mentioned.

"8. In view of the fact that the Flood Control Act evidently provided for maintenance work of this description, though no appropriation has ever been made; that such work is urgently needed at present;

(Continued on page 24)

## *Eight Major Projects Estimated to Cost \$1,359,100 Advertised for Bids*

**C.** H. PURCELL, State Highway Engineer and Chief of the Division of Highways, reported to Director Earl Lee Kelly of the Department of Public Works that during the month of December bids were called for the construction of eight major highway projects, estimated to cost approximately \$1,359,100. Six of the projects involve road construction on 26.2 miles of State highway and two projects call for the construction of three bridges on State routes.

Progress by the Division of Highways in taking advantage of Federal aid funds provided by the Emergency Relief and Construction Act, which was passed by Congress last July is evidenced by the fact that six of the eight projects advertised in December are emergency relief jobs.

California was apportioned \$4,667,000 of the \$120,000,000 provided by the act and this State will collect approximately \$3,500,000 Federal funds on contracts now under way and it is estimated that another \$1,000,000 will be collected on the six Federal aid projects advertised during December making a total of nearly \$4,500,000 in Federal emergency funds obligated to California by December 31st.

### BIG COAST PROJECT

The following brief descriptions of the more important projects included in the December advertising provide some conception of the extent of the work which was set in motion by the Division of Highways during the month just past.

The largest project advertised in December provides for the grading and paving of 4.1 miles of the Oxnard-Serra Highway along the coast north of Santa Monica. This work is a unit in the reconstruction of sections of this route to standards adequate for the large volume of traffic using this State road which lies between the foot of the high bluffs and the ocean beach.

The improvement will consist of placing a 40-foot pavement and grading and oiling shoulders on each side of the pavement for the full width of the 80-foot right of way. These wide shoulders will provide ample parking

area for the large crowds who seek recreation along the beach. Construction of a bridge across Topanga Creek which is within the limits of this project is now under way.

### WIDENING ARTERIAL

At the northerly end of the new Ridge Route Alternate which is now being paved, a project covering the 3.8 miles between Gorman and the northerly boundary of Los Angeles County is to be reconstructed with a 30-foot pavement on a 46-foot graded roadbed.

This improvement will bring this section of State highway to modern standards of grade and alignment and its completion, together with the completion of the two paving contracts now under way on the alternate route over the ridge, will provide motorists traveling this main arterial of the State highway system with a new 30-foot pavement from Castaic School to the Kern County line.

Five miles of the Coast Route in Monterey County, which extends from a point six miles south of San Ardo to one mile south of San Ardo, is to be reconstructed to modern standards of grade and alignment. This work is a unit in the general reconstruction program of this important and heavily traveled arterial which connects the metropolitan areas of Los Angeles and San Francisco.

### CURVES ELIMINATED

The extent of the improvement is shown by the reduction of the number of curves from 34 on the existing alignment to 6 on the revised line and the reduction of the maximum grade from 6 per cent to 4.5 per cent. The new road will provide a 20-foot pavement with 8-foot shoulders on each side of the pavement.

An improvement of much interest to the many motorists who use the Owens Valley road between Mojave and Bishop on the east side of the Sierra is the construction of a graded roadbed 38 feet wide with selected surfacing on the full width of the roadbed and with a bituminous treatment applied to the central 22 feet over 6.3 miles between Keough Hot Springs and Bishop. This improvement will be placed on a new location which lies to the west of the existing highway

(Continued on page 22)

## Work Put Under Way in December

The Division of Highways during the month of December advertised eight major highway projects, including three bridges. The projects are located in six counties. They involve road jobs totaling 26.2 miles and the construction of three bridges. In the list are six projects to be financed with the aid of Federal Emergency Relief funds.

### DETAILED LIST OF PROJECTS

| County          | Location                               | Route                                     | Miles | Type                                       |
|-----------------|--|---|-------|--|
| *Monterey       | 6 miles to 1 mile south of San Ardo    | Coast Route                               | 4.9   | Pavement                                   |
| *Los Angeles    | Las Flores Canyon to Santa Ynez Canyon | Oxnard-Serra Highway                      | 4.1   | Pavement                                   |
| *Los Angeles    | Gorman to Northernly Boundary          | Los Angeles-Sacramento Arterial           | 3.8   | Pavement                                   |
| *Los Angeles    | Oaks to Vasquez Rock Road              | Los Angeles-Mojave Road                   | 1.5   | Pavement                                   |
| *Inyo           | Keough Hot Springs to Bishop           | Owens Valley-Tahoe Road                   | 6.3   | Bit. Tr. Cr. Rock Surfacing                |
| Ventura         | Santa Paula to Wells Road              | Ventura-Castaic Lateral                   | 5.6   | Bit. Surf. Tr.                             |
| San Diego       | Across Cudahy Channel & Tecolote Creek | Coast Route                               |       | 2 Reinf. Cone. Grid. Bridges               |
| *San Bernardino | Across Mojave River at Barstow         | Mojave-Barstow Road and Barstow-Jean Road |       | 745' deck plate gir. and steel str. Bridge |

\*Federal Emergency Relief Fund Project.

### SUMMARY

| Type                         | Miles | Amount      |
|------------------------------|-------|-------------|
| Permanent Type of Pavement   | 14.3  | \$1,068,700 |
| Bituminous Treated Surfacing | 11.9  | 119,000     |
| Bridges                      | (3)   | 171,400     |
| Total                        |       | \$1,359,100 |

## *Piru Creek Forced to 'Zoom' 60 Feet Out of New Channel*

(Continued from page 4)

in low places to make a uniformly smooth surface.

The design of the outlet end of the concrete lined channel required a considerable amount of careful study. With the high velocity attained by the water in the channel, there would be a tendency to undercut the concrete channel paving and wingwalls unless some method were provided of dissipating the force of the water.

Studies were made of other channels and the methods used in controlling the undercutting action of the water. Much valuable information was obtained from the results of a series of model tests made at the Alden Hydraulic Laboratory of the Worcester Polytechnic Institute, where a model channel was built to scale with one side built of glass in order to better observe the action of the water. Several types of outlets were tested there and the effects on the erosion of the channel noted.

### PROVED BY MODEL

The type which gave the best result consisted of an outlet which deflected the water upward at an angle of about  $12\frac{1}{2}$  degrees. This type produced no appreciable erosion for a distance of 60 feet from the end of the channel. When used on an actual dam spillway, the results were almost exactly as predicted from model experiments.

The outlet end of the Piru Creek Channel Change was designed with these results in mind. A heavy cutoff wall was constructed at the end of the concrete lining with a heavy flaring wingwall on each side. The space at the bottoms of the walls was filled with heavy boulders. In addition, three groynes of boulders were constructed at approximately right angles to each wingwall and extending out into the stream to break the back eddy of the water.

It is expected that the fast moving water on approaching the outlet end of the concrete-lined channel will be deflected upward and literally pitched for a distance of 60 feet from the mouth of the channel. Much of its energy will be dissipated in this process and any erosive action will be at such a distance below the concrete work as not to undercut or endanger it.

## *Highway Relief Work Dollar Spreading to 50,000 Californians*

(Continued from page 2)

did cooperation of the various welfare organizations throughout the State, mayors of the various towns, American Legion Posts, and members of the Legislature, all of whom have given of their time and money to aid in selecting the most worthy ones in order that the most good for the most people could be secured through expenditure of these funds. We want to acknowledge with our sincere appreciation this splendid cooperation.

During the winter of 1931-32 the Department expended \$2,266,070 on maintenance crew work, which was divided into three-day-a-week jobs. This appropriation provided employment for 5493 heads of families where the average family consisted of three dependents making a grand total of 21,972 people aided directly by this work.

Of course, this aid also extended, as it does today, to the merchants and people furnishing means of shelter, clothing and subsistence to this total population.

In our Federal Aid projects for which we have been apportioned \$4,667,700 out of the \$120,000,000 provided for by the Emergency Relief and Construction Act of Congress of last July, the unskilled labor has been secured through the local relief and employment agencies in the locality where the project is being constructed.

## *Effect of Speeding on Gasoline Mileage*

WITH a Federal tax added to the State tax on gasoline, motorists will find much of interest in studies recently made relative to gasoline consumption of cars at different speeds.

According to the findings of carburetor experts, a gallon of gasoline which gives 20 miles to a gallon at a speed of 20 miles an hour may deliver only seven miles at 70 miles an hour.

At speeds from 20 to 40 miles an hour the decrease in mileage is only two miles, but grows rapidly at higher speeds.

At 50 tests showed 15 miles per gallon and 12.6 at 60.

Facsimile of a  
unique New Years'  
Greeting engrossed  
on Parchment  
Received by Director  
Earl Lee Kelly



Rank and File  
of Division VII  
join in sending  
Best wishes and  
a pledge of  
Loyal Cooperation

WHEREAS, EARL LEE KELLY, Director of the Department of Public Works, State of California, will enter the New Year facing the most difficult problems in the history of the Department of Public Works, and

WHEREAS, We, the undersigned employees of District VII, Division of Highways, Department of Public Works, realize that many trials and tribulations will confront the Director of the Department of Public Works during the year,

THEREFORE, we take this opportunity of extending our best wishes for the New Year to

EARL LEE KELLY

our Director, and pledge to him our loyal cooperation.

Subscribed to at Los Angeles, California, this 30th day  
of December, 1932.

St. Gonzalez  
John C. Mon  
Ralph C. Myers  
A. D. Griffin  
R. L. Thomas.  
A. N. George  
Earl T. Scott  
H. S. Allen  
H. B. Black  
Wm. Cunningham  
E. E. Belford  
Robert R. Blumhug  
Ralph E. Decker  
Fred P. Merrick  
Joseph Halpern  
Ernest R. Scott  
Francis E. Stangen  
Rafael L. Verdugo  
C. W. Coffin  
A. B. Edwards  
M. L. Bauders

Adolph M. Lutho  
D. S. Voorhees  
Louis Telis  
H. B. Zike  
H. W. Pettit  
W. O. Herpne.  
H. S. Throckmorton  
C. F. Wagner.  
L. Ann Uerson  
Lais Anne Stuart  
Georgina Dunbar  
Elizabeth A. Alexander  
Edison Johnston  
Ruth F. Kline  
Lakia Atkey  
Dorah Kirson  
Marie Dahlmann  
Frances Higgins  
E. M. MacDonald.  
S. R. McCulloch  
E. B. Curney

Shalaw Jones.  
Martinez A. Clark  
Warren B. James  
Mary F. Donnelly  
W. T. Johnson  
V. K. Tarwater  
Horton Whipple  
Eula C. Jacob  
Mairim Kayser  
M. W. Backand  
Lyle B. Bane  
Mina Catterton  
Edith Lloyd  
Victor A. Henderson  
Ralph H. Kinsey  
H. M. Fenwick.  
Samuel Olson  
Frank C. Balfour  
Lew J. Astorian  
Christ H. Parker  
Henry Hawthorne

Two hundred and eighty seven district employees in the field, whose signatures could not be obtained because of lack of time, concur in the above sentiment.

## CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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

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

EARL LEE KELLY.....Director  
JOHN W. HOWE.....Editor

Address communications to California Highways and Public Works, P. O. Box 1193, Sacramento, California.

Vol. 11 JAN.-FEB., 1933 Nos. 1-2

## SELF-SUPPORTING

It isn't all outgo when the motorist pays his license fee and gasoline tax.

Authoritative statements from various state highway departments say that the motorist comes out on the long end of the deal. The building of improved roads, it is shown, reduces car operating costs and from that one point alone the motorist gets back more than he pays out.

The state highway commission of Missouri fathers the statement that the average motorist in that state is saved \$30 a year over and above his license fee and gas tax payments. On that basis the roads on the Missouri state system, which includes 3,100 miles of concrete, are returning \$22,500,000 a year to the state's road users.

Although California is humorously thought of as a state of somewhat extravagant claims, there is no exaggeration in the state's announcement that her good highways, up to the middle of 1930, saved \$54,000,000 to motorists.

California's state highway department calculates per mile savings in car operating costs over improved roads on a very conservative basis, and then cuts the whole total in two.

Frank T. Sheets, chief engineer of the Illinois State Highway Department, relates that Illinois' state highway system, nearly all concrete paved, reduces car operating costs \$73,000,000 a year. This is \$25,000,000 more than motor car users pay out in taxes.

Such facts as these compose irrefutable evidence that highways are self-supporting, road authorities claim. The large savings due to good roads lift highways out of the class of most government activities.—South Dakota Highway Magazine.

## How Labor Gets 91% of Every \$1,000 Paid for Concrete Roads

THE following testimony by T. H. MacDonald, Chief, U. S. Bureau of Public Roads covers the distribution of \$1,000 paid for concrete highway and shows the approximate total amount which reaches the wage earner.

|  | Wages      |
|--|------------|
| Contractor receives \$1,000, of which direct construction receives .....   | \$ 141.00  |
| Contractor's \$859 remaining is distributed as follows:  |            |
| \$184 for getting onto job, equipment, bonds and insurance, gross profits, etc., of which direct labor receives .....                | 44.70      |
| And \$675 to mills and quarries of which direct labor receives .....   | 117.00     |
| The \$697.30 remaining (\$139.30 from contractor and \$558.00 from mills and quarries) after this distribution, is spent as follows: |            |
| Freight eventually receives \$406.70 of which direct labor receives .....  | 175.00     |
| Fuel eventually receives \$57.20, of which direct labor receives .....   | 38.00      |
| Repairs and depreciation eventually receives \$188.75, of which direct labor receives .....  | 56.00      |
| Materials and supplies eventually receive \$170.80, of which direct labor receives .....   | 157.65     |
| Taxes and redistribution items eventually equal \$49.50, of which direct labor receives .....  | 40.60      |
| Profits, interest, rents and depletion eventually equals \$209.15, of which direct labor receives .....                              | 139.15     |
| Labor eventually receives 91 per cent or.....  | \$ 910.00  |
| Owners expend .....  | 90.00      |
|  | \$1,000.00 |

NOTE: This table is made up by breaking down the original \$1,000 to each of the major items of expenditure.

It will be noted that the sums eventually received by freight, fuel, repairs and depreciation, materials and supplies, etc., exceed the \$859 left after labor is paid by the contractor. This is due to the redistribution of this money to its final destiny and is not broken up into its final parts each time. For example, freight eventually receives \$406.70, almost half the road dollar, and this is distributed as follows: Labor, \$175.00; material and supplies, \$40.00; fuel, \$21.70; interest, \$47.60; taxes, \$25.60; repairs and depreciations, \$53.50 and profit, \$42.60.—South Dakota Highway Magazine.

Heard about the fellow who got his car back from the auto laundry with the horn button missing?

## Two Miles of Ocean Front Obtained for State Public Park

(Continued from page 13)

in looking upon all sides of this important question has resulted, I believe, to our mutual benefit, for the new highway will cost much less than that originally projected, and we shall be able to retain unchanged the picturesque features of the present road.

I might mention many instances of similar cooperation in working out highway realignment in State parks, notable among them being the new highways at Point Lobos in Monterey County and Mission Bay in San Diego County.

Probably more important than any other phase of the joint effort of the Park and Highway divisions is their accomplishment in pooling resources in a number of instances so as to acquire lands of considerable park value along newly constructed highways.

One of the primary issues in the campaign for the State Park Bonds in 1928 was the preservation for the citizens of California of an adequate percentage of her seacoast. It was pointed out that with close to a thousand miles of ocean frontage in California only a very small percentage was assured of being forever accessible to the public.

### PRESERVED FOR PUBLIC

But essential acquisitions have been made by the State Park Commission, with the aid of bond fund money matched by local communities or private individuals, and one of the most satisfactory projects which has been carried out involves two miles of ocean front, including several excellent beaches between Cambria Pines and the mouth of San Simcon Creek on the new Carmel-San Simeon Highway.

It was due to the enterprise of the Division of Highways that when the new right of way was acquired for these two miles at the same time options were obtained on behalf of the Division of Parks for the land lying between the highway right of way and the mean high tide line of the Pacific Ocean. Through the generosity of two of the owners through whose property the new highway ran, Mr. William Randolph Hearst and Mr. Vine Van Gorden, tracts of land were donated to the State for park purposes and matched with State Park bond money to acquire the remainder of the two-mile strip.

## Snow Removal Pays Dividends in Large Savings to Motorists

(Continued from page 6)

being performed only in their spring opening.

| State Route No.    | Location   | Mileage |
|--------------------|--|---------|
| 1                  | Ukiah to Oregon Line (Portions).....               | 106.1   |
| 3                  | Redding to Oregon Line (Portions).....             | 126.1   |
| 4                  | Saugus to Grapevine.....                           | 67.8    |
| 11                 | Placerville to Meyers.....                         | 63.9    |
| 12                 | Guatay to Boulevard.....                           | 100.0   |
| 13                 | Pooleys to Long Barn.....                          | 32.2    |
| 15                 | Rough and Ready to Washington Road.....            | 22.6    |
| 17                 | Auburn to Nevada City.....                         | 21.0    |
| 18                 | Cathay to Yosemite Park.....                       | 30.0    |
| 20                 | Redding to Blue Lake (Portions).....               | 103.0   |
| 21                 | Oroville to Beckwith Pass.....                     | 166.1   |
| 23                 | Saugus to Woodfords (Portions).....                | 104.6   |
| 24                 | Angels Camp to Ebbetts Pass.....                   | 56.1    |
| 25                 | Nevada City to Downieville.....                    | 42.3    |
| 28                 | Redding to Alturas and Nevada State Line.....      | 188.6   |
| 29                 | Red Bluff to Susanville and Nevada State Line..... | 176.4   |
| 31                 | San Bernardino to Barstow.....                     | 35.0    |
| 34                 | Pine Grove to Carson Pass (Portions).....          | 32.3    |
| 35                 | Peanut to Kuntz.....                               | 29.0    |
| 37                 | Colfax to Truckee.....                             | 70.5    |
| 38                 | Meyers to State Line at Verdi.....                 | 65.4    |
| 39                 | Tahoe City to Brockway.....                        | 11.1    |
| 40                 | Chinese Camp to Yosemite Park (Portions).....      | 31.1    |
| 41                 | General Grant Park.....                            | 25.0    |
| 43                 | San Bernardino to Fawnskin.....                    | 45.7    |
| 46                 | Weitchpec to Happy Camp.....                       | 75.0    |
| 49                 | Calistoga to Middletown.....                       | 8.0     |
| 57                 | Walker Pass.....                                   | 8.4     |
| 58                 | Arvin Road to Mojave (Portions).....               | 39.9    |
| 65                 | Coloma to Placerville.....                         | 20.8    |
| 72                 | Weed to Oregon State Line at Calor.....            | 63.1    |
| 73                 | Alturas to Oregon State Line at New Pine.....      | 38.6    |
| 76                 | Bishop to Nevada State Line.....                   | 41.3    |
| TOTAL MILEAGE..... |  | 2047.0  |

Thus, instead of being subject to subdivision of doubtful landscape value or being fenced off entirely from the public, this two-mile strip will remain as a part of the California State Park System with ever increasing scenic and recreational possibilities when the new route is completed between San Francisco and Los Angeles.

As chairman of the California State Park Commission and speaking for that body as a whole, I am glad of the opportunity to tell of some of these examples of joint action by the Divisions of Highways and Parks to the great present and future benefit of the citizens of California.

## Relief Work a Bulwark Against Dole

(Continued from page 11)

able means of levelling off the hollow of the depression and that it was a bulwark against a direct dole, with the attendant demoralization which continued charity produces, and everything considered, highway construction and maintenance as a form of unemployment relief returns full value for the investment.

Mr. Dillman produced statistics to show that for every man employed in highway construction, two more are employed in the production and transportation of materials and equipment and that for every \$350 expended on road work one man is directly employed for one month and two more indirectly employed for a similar period.

### SECRETARY WILBUR SPEAKS

On the afternoon of November 16th the meeting was addressed by the Honorable Ray Lyman Wilbur, Secretary of the United States Department of the Interior. Dr. Wilbur spoke on the necessity of highway beautification and the development of roads in national parks and monuments that they might be more accessible to the motoring public. Dr. Wilbur stated that between forty and fifty millions of people, equal to nearly half the population of the United States, visit these parks and monuments yearly, which seems to be a preponderance of evidence that the citizens of this nation are alive to natural beauty and fully expect the development of highways to carry them to these spots of recreation.

Following Dr. Wilbur, Henry G. Shirley, State Highway Commissioner from Virginia, spoke on "Federal and State Highway Expenditures as part of Government Obligations." Mr. Shirley emphasized the responsibility of governmental bodies for development within the confines of their commonwealths and of the necessity of adequate transportation facilities for the furtherance of that development.

On the morning of the 17th the association met in business session and Frederic E. Everett, State High-

way Commissioner from New Hampshire and president of the association presided and delivered his address. Mr. Everett reviewed the addresses which had been given and briefly summarized the achievements of highway advancement in the United States during the past year.

In summarizing the trend of opinion as expressed during this eighteenth annual meeting of the American Association of State Highway Officials two features seem to stand out in bold relief.

### TREND OF OPINION

**First:** The danger of extending State highway systems beyond the capacity of revenues required for maintenance, reconstruction and new construction.

**Second:** Providing unemployment relief during periods of depression by highway construction is an admirable means of reestablishing confidence and results in the increase of the capital investment of the most valuable asset to the State and nation.

In all probability the most important feature of the activities of this association is the work of the various committees on maintenance, construction and design. Sessions of these committees were held on the evening of the 16th. It is the presentation of facts resulting from research and study of design, and methods and discussion pertaining to them in the committee sessions which is the vitalizing factor of the association.

The free interchange of knowledge, through these committees, by the various State highway departments has engendered a degree of confidence and cooperation within the organization which has made possible the coordinated uniformity of highway development which now obtains throughout the nation. The experience of each State has been made available to the other States, therein avoiding the waste of duplicated trial and error.

## EIGHT MAJOR PROJECTS ADVERTISED FOR BIDS

(Continued from page 16)

on higher ground affording better subgrade drainage. The new alignment will be a great improvement over the existing crooked road.

At Barstow in San Bernardino County a 745-foot deck plate girder and steel stringer bridge on concrete piers and abutments is to be constructed across the Mojave River. The structure will be located at the northerly entrance of the State highway to Barstow and will serve traffic using both the Mojave-Barstow-Needles highway and the interstate highway between Barstow and Jean, Nevada.

This new and modern bridge will have a

concrete deck and will provide a clear roadway 24 feet wide with two 3-foot sidewalks. It will replace the old steel truss and timber trestle, with its narrow 17-foot roadway, which has served traffic at this river crossing since the old days when twenty-mule freighters trudged the sandy tracks of the great Mojave desert.

### A GOOD SHOT

The Irish night watchman at the observatory was new. He paused to watch a man peering through a large telescope. Just then a star fell.

"Man alive," he exclaimed with amazement, "you're shure a foine shot."—*Tennessee Road Builder*.

"Doctor, can't something be done about my husband talking in his sleep? It's all so indistinct!"—*Life*.



## Bids and Awards on Highway Projects Made in December

**KERN COUNTY**—13 span timber bridge across Walker Creek. District VI, Route 58, Section D. Fred W. Nighbert, Bakersfield, \$13,676; Lynch Cannon Engineering Co., Los Angeles, \$12,731; Paul Opperman, Bakersfield, \$14,436; Herbert Baruch Corporation, Ltd., and Robinson-Roberts Co., Los Angeles, \$13,913; M. B. McGowan, Inc., San Francisco, \$13,689; R. R. Bishop, Long Beach, \$12,258; Hartman Construction Co., and G. A. Graham, Bakersfield, \$12,070; Lindgren & Swinerton, San Francisco, \$12,808; Stroud Bros. and Seabrook, Bakersfield, \$12,186. Contract awarded to Carl Ingalls, Inc., Bakersfield, \$11,767.

**KERN COUNTY**—11 span timber bridge across Caliente Creek. District VI, Route 58, Section D. Fred W. Nighbert, Bakersfield, \$12,380; Lynch Cannon Engineering Co., Los Angeles, \$11,663; Paul Opperman, Bakersfield, \$13,315; Herbert Baruch Corporation, Ltd., and Robinson-Roberts Co., Los Angeles, \$12,845; M. B. McGowan, Inc., San Francisco, \$12,546; R. R. Bishop, Long Beach, \$11,206; Hartman Construction Co., and G. A. Graham, Bakersfield, \$10,969; Lindgren & Swinerton, Inc., San Francisco, \$11,618; Stroud Bros., and Seabrook, Bakersfield, \$10,822. Contract awarded to Carl Ingalls, Inc., Bakersfield, \$10,822.

**LOS ANGELES COUNTY**—Between Tujunga and La Canada, about 4.0 miles to be graded and paved with asphalt concrete. District VII, Route 9, Section A. Southern California Roads Co., Los Angeles, \$177,193.50; Oswald Bros., Los Angeles, \$139,184; Southwest Paving Co., Los Angeles, \$147,903; Hall-Johnson Co., Alhambra, \$178,713.50; George R. Curtis Paving Co., Los Angeles, \$151,579.65. Contract awarded to Griffith Co., Los Angeles, \$138,846.

**LOS ANGELES COUNTY**—Between Santa Ynez Canyon and Santa Monica Canyon about 1.5 miles slopes to be excavated. District VII, Route 60, Section B. Von der Hellen & Pierson, Castaic, \$103,323; M. S. Ross, Los Angeles, \$123,894; Guy F. Atkinson Co., San Francisco, \$132,934; S. N. Palmer & J. P. Holland, Inc., San Francisco, \$119,251; Herbert M. Baruch Corp., Los Angeles, \$133,150; Weymouth Crowell Co., and E. Penn Watson, Jr., Los Angeles, \$130,273; Merrill-Chapman & Scott, \$110,114; Griffith Co., Los Angeles, \$169,104. Contract awarded to C. G. Willis & Sons, Inc., Los Angeles, \$102,076.

**LOS ANGELES-ORANGE COUNTIES**—Between Long Beach and Seal Beach, 1.3 miles of existing road to be resurfaced. District VII, Route 60, Section F-A. Sully-Miller Contracting Co., Long Beach, \$2,596; H. E. Cox & Son, Pasadena, \$3,681; Sanders Pearson, Santa Monica, \$3,776. Contract awarded to Griffith Company, Los Angeles, \$2,421.

**LOS ANGELES COUNTY**—Between Encino and Girard, about 0.3 mile of guard rail to be installed. District VII, Route 2, Section B. George Tennyson, Alhambra, \$1,288; Joseph Maiser, Los Angeles, \$1,339; D. A. Loomis, Glendale, \$1,365; Kovacevich & Price, Inc., South Gate, \$1,494; R. A. Wattson, Los Angeles, \$1,545; J. B. McIntosh, Glendale, \$1,663; Contracting Engineers, Inc., Los Angeles, \$1,674; W. J. Distell, Los Angeles, \$1,764; Chas. Booth & Perry Tomer, Los Angeles, \$1,803; H. E. Cox & Son, Pasadena, \$1,883. Contract awarded to Raymond H. Liggett, Lynwood, \$1,223.60.

**LOS ANGELES COUNTY**—Erection and completion of maintenance station buildings near Glendora. District VII. Wigg Construction Co., Redondo Beach, \$1,652; Wm. J. Esser, Long Beach, \$1,980; S. & W. Const. Co., (Streiff & Witt), Los Angeles, \$2,143; R. Royden Hopper, Arcadia, \$2,144; Joseph Maiser, Los Angeles, \$2,147; Jacobson & Jacobson, Los Angeles, \$2,157; W. O. Moamaw, La Verne, \$2,169; J. B. McIntosh, Glendale, \$2,230; Contracting Engineers, Inc., Los Angeles, \$2,269; John Strona, Pomona, \$2,371. Contract awarded to George Krivic, Los Angeles, \$1,456.

**MERCED COUNTY**—Between Merced and Merced Airport, about 0.6 mile to be graded and paved with Portland cement concrete. District VI, Route 4, Section C. A. J. Raich, San Jose, \$28,999; Valley Paving & Construction Co., Fresno, \$31,397; Bundeson & Lauritzen and Delta Dredging Co., Pittsburg, \$36,928; D. McDonald & N. M. Ball, Sacramento, \$31,246; M. J. Bevanda, Stockton, \$36,739; United Concrete Pipe Corporation, Los Angeles, \$29,470. Contract awarded to Clyde W. Wood, Stockton, \$23,409.

### HERE'S CHEER FOR ROAD CREW'S WORK IN A STORM

"Mr. Earl Lee Kelly, Director,  
Department of Public Works,  
Sacramento, California.

Dear Mr. Kelly:

On a recent evening Mrs. Smith and myself accompanied by two friends left the Hotel Alexandria enroute home, as we had to be on the job next morning. It would be entirely remiss if I did not drop you this short letter to tell you how well your road crews were performing at Castaic on one end of the ridge to just above the Grapevine on this side.

As you know we have been over this piece of highway many times, but you had a real problem that evening, and this letter is just a word of thanks to you and your men in keeping this highway open and traffic moving under stressing conditions of rain, sleet, snow and fog and excessive cold.

I particularly stopped and looked at one of your plows, in fact all of your equipment and men were moving like they knew what they were doing.

With kindest regards.

Cordially and hospitably,

(Signed) CLAYTON V. SMITH.

Executive Vice President, The Hamilton Chain  
of Hotels—Headquarters: Hotel Fresno."

### She Knew Him

Bump—Has your wife learned to drive the car yet?  
Bumper—Yes, in an advisory capacity.

Son—"What does the word 'chauffeur' mean?"

Father—"That is the name given to the driver of a motor car."

Son (after a moment's thought)—"That was not the name you gave to the driver of the car that nearly ran over you yesterday."—*National Motorist*.

**MONO COUNTY**—Between Whiskey Creek and Convict Creek, about 4.3 miles to be graded and surfaced with bituminous treated crushed gravel or stone. District IX, Route 23, Sections C. D. U. B. Lee, San Leandro, \$68,815.60. Contract awarded to Southwest Paving Co., Los Angeles, \$51,591.30.

**TEHAMA COUNTY**—Between Southerly Boundary and Corning, about 8.9 miles to be graded and paved with asphalt concrete. District II, Route 7, Section A. California Construction Co., and D. McDonald, San Francisco, \$136,446; A. Teichert & Son, Inc., Sacramento, \$137,280; Peninsula Paving Co., San Francisco, \$147,166; Clark & Henery Construction Co., San Francisco, \$151,765; Granite Construction Company, Ltd., Watsonville, \$158,660; J. R. Reeves and Lord & Bishop, Sacramento, \$159,203; Hemstreet & Bell, Marysville, \$152,685; M. J. Bevanda, Stockton, \$139,154; Union Paving Co., San Francisco, \$142,550. Contract awarded to Hanrahan Company, San Francisco, \$129,305.50.

**VENTURA COUNTY**—Between Santa Clara River and Ventura, about 4 miles to be graded and paved with Portland cement concrete. District VII, Route 2, Section C. Sander Pearson, Santa Monica, \$113,587.50; E. H. Bashaw, North Hollywood, \$107,301; J. L. McClain, Los Angeles, \$106,459.50; Griffith Co., Los Angeles, \$101,392.50; United Concrete Pipe Corporation, Los Angeles, \$104,796.22; M. J. Bevanda, Stockton, \$102,671. Contract awarded to Kovacevich & Price, Inc., Southgate, \$96,469.

## Program for River Bank Construction

(Continued from page 15)

and that the State has indicated its willingness to furnish certain funds for this work, I recommend, provided the State makes available these funds, that:

- (1) The government make available funds not to exceed \$100,000 a year for this work.
- (2) All work be done under the supervision of the California Debris Commission.
- (3) That only work of a permanent nature be installed.
- (4) The proportion of government funds to State funds expended be in the proportion of 2 to 1.
- (5) Any necessary rights-of-way to be furnished by State authorities.

"9. No further appropriation will be needed to provide this \$100,000 per annum as long as the present Flood Control Appropriation of \$1,000,000 per annum is continued, due to the fact that the project is costing less than originally estimated. The recommendation that the State pay only one-third of the work is based on the facts that that proportion of funds will be spent on the work below the high water line, and, therefore, chiefly for channel protection, and that the State has spent large sums on this work, while the government has appropriated nothing to date.

#### CHIEF APPROVES

"10. In the event the above recommendations are approved, a complete plan for the revetment of the river will be drawn up, including detailed costs and types of revetment to be used. A memorandum from the Department of Public Works, Division of Water Resources, giving details as to the State's work in this connection in the past is attached herewith.

J. G. DRINKWATER,  
Captain, Corps of Engineers,  
District Engineer.

#### FIRST INDORSEMENT

Washington, D. C., June 29, 1932—To the Chief of Engineers:

"Recommending approval of the procedure outlined by the district engineer in paragraph 8 of the above memorandum, with the understanding that the State of California will be able to contribute only \$10,000 towards the work in question for the fiscal year 1933, but undertakes thereafter to contribute \$50,000 per year; all as agreed upon at a conference with the Chief of Engineers on June 27, 1932, by Congressman Curry, Mr. Hyatt, State Engineer, and Major Barton, Chief Engineer, State Reclamation Board.

THOMAS M. ROBINS,  
Lieut. Col., Corps of Engineers,  
Division Engineer, Pacific Division."

Approved June 29, 1932.

Lytle Brown, Major General,  
Chief of Engineers.

The following program of construction covering bank maintenance on the Sacramento River for the

fiscal year ending 1933 has been approved by the California Debris Commission:

- (1) Chicory Bend, District 900, left, Mile 53.5, 1500 feet.
- (2) District 730, Rosebury, right, Mile 84.3, 400 feet.
- (3) District 730, Russell, right, Mile 85.0, 400 feet.
- (4) Girdner Bend, District 70, left, Mile 126.3, 700 feet.
- (5) Below Moulton weir, left, Mile 158.5, 200 feet.
- (6) Portuguese Bend, District 744, left, Mile 44.0, 1000 feet.
- (7) District 307, right, Mile 43.0, 300 feet.
- (8) Tyndall Mound, District 108, right, Mile 102, 700 feet.
- (9) Ministerial Bend, District 1500, left, Mile 104.5, 500 feet.
- (10) Near Taylor Monument, right, Mile 67.0, 100 feet.
- (11) Above Glide, Landing, District 900, right, Mile 51.3, 400 feet.
- (12) Three Mile Slough, Sherman Island side, 300 feet.
- (13) Riverview Station, District 755, right, Mile 49.5, 200 feet.
- (14) Nelson warehouse, District 108, right, Mile 125.0, 100 feet.

It is estimated that the above program can be carried out this fiscal year at a cost of \$100,000, including \$10,000 of State funds, which will be expended by the State to provide the bank maintenance necessary at Tyndall Mound, item (8), length 700 feet.

The work to be done under this program in the present fiscal year is now well under way, the California Debris Commission being engaged in constructing the works designated items (1), (2), (3), (6) and (11) above, and the portion of the work to be done by the State to cost \$10,000, item (8), protection at Tyndall Mound, is now being done by the Division of Water Resources under charge of the writer.

During the period required to carry out the complete program, it will be necessary for the State to continue to perform emergency work of a temporary nature and to maintain existing protection in cooperation with other agencies, as a part of the maintenance of the flood control project. This period will be at least ten years, and the need for funds for this purpose will be greatest at the outset, gradually diminishing as the permanent program progresses.

#### His Lucky Day

The electricians were making some repairs on the local school.

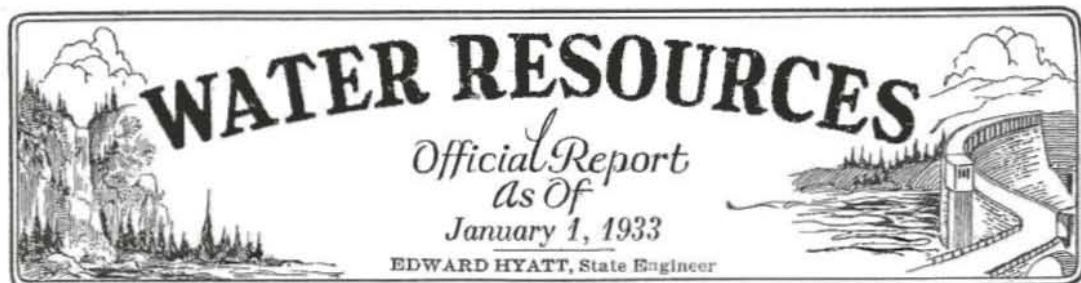
Schoolboy: "What are you doing, mister?"

Electrician: "Installing an electric switch."

Boy: "Well, I don't care. Our family is moving today, and I won't be going to this school any more."

—Answers.

When you are asked to pass judgment on your wife's new dress, be sure your criticism is perfectly candid.—*Union Oil Bulletin.*



The announcement that a method has been found for ending the salinity problem of the Sacramento-San Joaquin Delta by control of stream flow, and the further important news that a new agreement has been made with the Federal Government for construction of the All-American canal from the Colorado River in Imperial County at a reduced cost estimate, are two features of the December report of State Engineer Edward Hyatt covering the activities of the Division of Water Resources. The report, including details of flood control and reclamation projects, snow surveys, dam repairs and water application is as follows:

One of the conditions required to make effective the contract between the United States and the Imperial Irrigation District for the construction of the All-American Canal from the Colorado River was that there should be included within the boundaries of the district substantially all of the lands that could be served by the canal. The district accepted the contract in an election held February 11, 1932, but subsequently found it impossible to meet the inclusion condition, particularly with reference to the lands in Coachella Valley and adjacent areas. These lands are mostly included in the Coachella Valley County Water District and apparently the owners prefer to act independently under their own organization.

This situation has resulted in a new contract between the United States and the Imperial Irrigation District, under which the inclusion of new lands, with the exception of certain public lands, is optional with the district. Under the old contract the estimated cost involved was \$33,600,000, under the new it is estimated at about \$25,000,000. Pursuant to the provisions of law (Stats. 1917, p. 243) the new contract was examined and reported upon by the State Engineer, under date of December 14, 1932.

#### DISTRICTS SECURITIES COMMISSION

During December the following matters were acted upon by the California Districts Securities Commission:

##### Expenditures approved:

|                                  |          |
|----------------------------------|----------|
| Nevada Irrigation District.....  | \$44,143 |
| El Nido Irrigation District..... | 28,800   |

Refunding bonds recommended to the State Controller for certification:

|  |             |
|--|-------------|
| Nevada Irrigation District.....            | \$8,100,000 |
| Oakdale Irrigation District.....           | 2,320,000   |
| South San Joaquin Irrigation District..... | 4,791,000   |

A plan for refunding \$14,250,000 in bonds by the Imperial Irrigation District was approved, as was also the new contract of that district with the United States for the construction of the All-American Canal.

#### FLOOD CONTROL AND RECLAMATION

##### Maintenance of Sacramento Flood Control Project.

The work of clearing the channels of the Sutter and Tisdale Bypasses was continued throughout the past month. The clearing crew averaged about 80 men.

Considerable maintenance work was done on the drainage system. This consisted for the most part of the removal of tules, brush, etc., from the canals. Work was also done on the drainage pumping plants in order to have them in good running condition for the winter pumping season. Another item in this maintenance work was the installation of new trash screens.

##### Sacramento Flood Control Project—Bank Protection.

On December 20th work was started on the bank protection job on the right bank of the Sacramento River at Tyndall Mound, 12 miles above Knights Landing. A dragline is now at work trimming the bank at this point. Upon completion of this work a rock blanket from one to two feet in thickness will be placed on the slope. Thirty-three hundred tons of rock have been ordered for this purpose. It is estimated the entire job will cost about \$10,000.

##### Sacramento Flood Control Project—Construction.

Reports have been rendered on several applications before the Reclamation Board and work done under various applications has been inspected.

The clearing of the overflow channel of the Feather River which began November 3d was shut down on December 8th, all available funds having been expended. This work involved the expenditure of \$14,000, representing 3,126 man days and gave employment to 541 different men.

At the regular monthly meeting on December 21st the Reclamation Board allocated \$1,080 for clearing work on the American River flood control project. Work will be carried on by the Division of Water Resources.

# More Water Power for Los Angeles

(Continued from page 25)

## Russian River Jetty.

Early in December \$5,000 was made available from the emergency fund to carry on the maintenance of the Russian River jetty. It is estimated that this money will be sufficient to keep a crew of from 10 to 12 men engaged in the placing of rock until about February 1st.

## Flood Measurements and Gages.

All our gaging stations are now in operation. The work of putting the metering equipment in serviceable condition is in progress. An improved sounding boom to be used for making flood discharge measurements has been developed by this office. Four booms are now being constructed for use during the present flood season.

## Emergency Flood Protection and Rectification of Rivers.

A small cooperative bank protection job is being carried on at the mouth of Little River, Humboldt County. This work is being done in cooperation with Hammond and Little River Redwood Co. Ltd. The work consists of reinforcing a pile and timber bulkhead with rock and gravel.

## WATER RIGHTS

### Applications to Appropriate.

Thirty-three applications to appropriate water were received during the month of November; 20 were denied and 16 were approved. In the same period 9 permits were revoked and 7 were passed to license.

Among the more important applications were two by George W. Spencer of Los Angeles seeking to appropriate from Baldwin Lake and Arrastra Creek for irrigation purposes at an estimated cost of \$135,000.

Among the more important permits issued was one allowing the reappropriation and reuse by the Pacific Gas and Electric Company at its Folsom power plant of the water stored on upper South Fork of American River and used at the Eldorado and American River plants.

Three applications of the City of Los Angeles which were approved during the month involve appropriations for power purposes from Cottonwood Creek and tributaries and Big Pine Creek and tributaries in Inyo County and Rock Creek and tributaries in Mono County at an estimated cost of \$6,800,000. Another application of the City of Los Angeles which was approved involved an appropriation for municipal purposes from Symmes Creek in Inyo County at an estimated cost of \$49,000.

## ADJUDICATIONS

*Eagle Creek (Modoc County).* The report covering the distribution of the water of Eagle Creek in

accordance with the trial schedule of allotments adopted for the 1932 season has been completed.

*South Fork Pit River (Modoc County).* The report covering the field work on the investigation of the water supply and use of water on the South Fork Pit River is 50 per cent completed.

*Hat Creek (Shasta County).* The stipulation for judgment prepared by the Division is being circulated by counsel among the interested parties.

*Deep Creek, Franklin Creek, Cottonwood Creek and Pine Creek in Surprise Valley (Modoc County).* Reports on these court reference cases will be prepared following completion of the South Fork of Pit River reports.

*Pit River in Big Valley (Modoc and Lassen Counties).* The report covering supervision of diversions from Pit River in Big Valley for the 1932 season is 75 per cent completed.

## SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Work during the past month has been chiefly in the office in computing and compiling all data for the 1932 report of the diversions, return flow, use of water, salinity, etc., throughout the Sacramento-San Joaquin territory. Field work has comprised the maintenance of a reduced number of salinity stations and the eight Delta tide gages. Since the recent storm the flow of the Sacramento River at Sacramento has increased to about 6200 second-feet, somewhat accelerating the recession of salinity occurring in the vicinity of Sherman Island at the lower point of the Delta. Salinity of 100 parts of chlorine per 100,000 is now only a short distance above Antioch and Collinsville. In the following tabulation the salinity on December 10, 1932 at some of the Delta stations is compared to the corresponding salinity on December 10, 1931.

| Station—               | Salinity in parts of chlorine per 100,000 parts of water |          |
|------------------------|--|----------|
|                        | 12/10/32   | 12/10/31 |
| Point Orient.....      | 1560   | 1820     |
| Point Davis.....       | 1360   | 1500     |
| Bullshead.....         | 1060   | 1235     |
| Bay Point.....         | 760  | 960      |
| Collinsville.....      | 260  | 370      |
| Emmaton.....           | 10   | 164      |
| Rio Vista.....         | 1  | 19       |
| Antioch.....           | 180  | 390      |
| Jersey.....            | 52   | 98       |
| Central Landing.....   | 4  | 34       |
| Middle River P. O..... | 8  | 110      |

## CALIFORNIA COOPERATIVE SNOW SURVEYS

Work on this project during the past month has been entirely in the office in computing the 1931-32

# Report Issued on Salinity Control

(Continued from preceding page)

natural flow at the various stream gaging stations which reflect snow run-off. These computations have shown that in general the seasonal and April-July run-off corresponded closely with the quantities forecast on April 1st based on snow surveys. Other office work has included routine maintenance to date of precipitation tabulations, etc.

## DAMS

Certificates of approval for 546 dams, and 5 certificates of approval of removal have been issued to date.

To date 818 applications for approval of dams built prior to August 14, 1929 have been received of which 710 have been found to be under jurisdiction; 108 for approval of plans for construction or enlargement and 374 applications for approval of plans for repair, alteration or removal.

Fifteen dams are under construction or enlargement and 130 are under repair.

### Applications Received for Approval of Plans and Specifications for Construction or Enlargement.

|                      |  |
|----------------------|--|
| Dam                  | Frank McArthur; Christensen and Humphrey |
| Grant Company Lake * | Paragon Gravel Mine                      |
| Payne *              |  |
| Bayley *             | County                                   |
| Paragon **           | Santa Clara                              |
|                      | Modoc                                    |
| Owner                | Modoc                                    |
| J. D. Grant Company  | Placer                                   |
| Frank McArthur       |  |

### Applications Received for Approval of Plans for Repair.

|                                |         |
|--------------------------------|---------|
| Dam                            | County  |
| Durant                         | Alameda |
| Owner                          |         |
| Bank of America, N. T. & S. A. |         |

### Plans Approved for Construction or Enlargement.

|                     |  |
|---------------------|--|
| Dam                 | Frank McArthur; Christensen & Humphrey |
| Williamson *        | Sweetwater Fruit Company               |
| Dry Canyon *        |  |
| Payne *             | County                                 |
| Bayley *            | El Dorado                              |
| Keen Valley **      | Los Angeles                            |
| Owner               | Modoc                                  |
| Hector Williamson   | Modoc                                  |
| City of Los Angeles | San Diego                              |
| Frank McArthur      |  |

### Plans Approved for Repair or Alteration.

|                                  |                              |
|----------------------------------|------------------------------|
| Dam                              | Hunewill, Dressler & Simpson |
| Sharp Park                       | Bank of America              |
| Lower Twin Lakes                 |                              |
| Durant                           | County                       |
| Owner                            | San Mateo                    |
| City and County of San Francisco | Mono                         |
|                                  | Alameda                      |

The great number of dams undergoing repair is especially noticeable for this time of the year due to requests from the department, instituted prior to August 14th of this year. According to

the Dam Act, which placed August 14 as the limiting date, owners either voluntarily submitted application to place their dams in the condition required by this office, or in a few cases, were ordered to do the work. In all but a few isolated cases, those to whom orders were issued are complying with them to the best of their ability.

## COOPERATIVE TOPOGRAPHIC MAPPING

The Division of Water Resources in cooperation with the Topographic Branch of the U. S. Geological Survey has recently completed field work in connection with the Truckee, Bartle and Colfax sheets and an unnamed sheet immediately west of Corcoran, presently designated as No. 41. Topographic mapping of the Treadwell and East half of Whiteriver sheets and two additional unnamed sheets presently designated as Nos. 39 and 40, west of Corcoran is in progress. Horizontal controls have recently been established for the area immediately north of Ukiah and vertical controls are being established in the vicinity of Healdsburg, Sebastapol, Eureka, Willows and Red Bluff and to the west of Williams.

The advance sheet (uncolored) covering the La Panza quadrangle has recently been released.

In addition to the cooperative work, topographic surveys of the Yreka and North half of Dixie sheets have recently been completed by the Geological Survey for the U. S. Forest Service.

## WATER RESOURCES

*Pit River Investigation (Modoc and Lassen counties).* Work on the report covering the three years' investigation was continued during the present month.

*Salinas Valley, Mojave River, Ventura County and South Coastal Basin Investigations.* Progress is being made on these investigations which are proceeding along routine lines.

## STATE WATER PLAN

The Director of Public Works announced the release by the State Engineer of a report on the "Variation and Control of Salinity in Sacramento-San Joaquin Delta and Upper San Francisco Bay," during the present month. The report is published as Bulletin No. 27 of the Division of Water Resources of the State Department of Public Works, and is one of the series of reports prepared on the State Water Plan.

This report is the result of intensive investigations and studies by the State of salinity conditions in the Sacramento-San Joaquin Delta and upper bay channels which have been under way for over ten years.

As a result of the analytical studies of this investigation, a method has been found for effec-

(Continued on page 36)

\* Enlargement.  
\*\* New construction.

# Water Applications and Permits

## APPLICATIONS FILED

Applications for permits to appropriate water filed with the Department of Public Works, Division of Water Resources during the month of December, 1932.

**TRINITY COUNTY**—Application 7450. Norris R. Ferguson, Junction City, Cal., for 0.1 c.f.s. from unnamed stream tributary to Canyon Creek, thence Trinity River to be diverted in Sec. 36, T. 34 N., R. 11 W., M. D. B. and M. For mining and domestic purposes. Estimated cost \$75.

**SISKIYOU COUNTY**—Application 7451. H. W. A. Docker, Forks of Salmon, Cal., for 5 c.f.s. from Granite Creek, tributary to Knownothing Creek, thence South Fork Salmon River, to be diverted in Sec. 7, T. 9 N., R. 8 E., H. B. and M. For power purposes. Estimated cost \$800.

**STANISLAUS COUNTY**—Application 7452. J. M. de Souza, Route 3, Box 944, Modesto, Cal., for 0.5 c.f.s. from Tuolumne River, tributary to San Joaquin River, to be diverted in Sec. 12, T. 4 S., R. 7 E., M. D. B. and M. For irrigation purposes (40 acres). Estimated cost \$100.

**VENTURA COUNTY**—Application 7453. W. A. Matthews, Box 323, Maricopa, Cal., for 2 miners' inches from Blue Rock Springs, tributary to Quatal Canyon, thence Cuyama River to be diverted in Sec. 20, T. 9 N., R. 23 W., S. B. B. and M. For irrigation and domestic purposes (3 acres). Estimated cost \$800.

**ELDORADO COUNTY**—Application 7454. C. M. Carter, R. D. Nicol and W. P. Austin, 1733 Jefferson Street, Oakland, Cal., for 100,000 acre-feet per annum from South Fork American River tributary to American River, thence Sacramento River to be diverted in Sec. 21, T. 11 N., R. 9 E., M. D. B. and M. (For municipal purposes. Estimated cost \$9,000,000.

**ELDORADO COUNTY**—Application 7455. C. M. Carter, R. D. Nicol and W. P. Austin, 1733 Jefferson Street, Oakland, Cal., for 614,000 acre-feet per annum from South Fork American River tributary to American River, thence Sacramento River, to be diverted in Sec. 21, T. 11 N., R. 9 E., M. D. B. and M. For irrigation purposes (450,000 acres). Estimated cost \$9,000,000.

**PLACER AND SUTTER COUNTIES**—Application 7456. William A. Glenn, 2300 Portola Way, Sacramento, Cal., for 3 c.f.s. and 8 acre-feet per annum from Auburn Ravine tributary to Sacramento River, to be diverted in Sec. 30, T. 12 N., R. 5 E., and Sec. 26, T. 12 N., R. 4 E., M. D. B. and M. For irrigation and domestic purposes (760 acres). Estimated cost \$500.

**PLACER COUNTY**—Application 7457. Dr. J. L. Hardin, 2300 Portola Way, Sacramento, Cal., for 3 c.f.s. and 9 acre-feet per annum from Auburn Ravine, tributary to Sacramento River, to be diverted in Secs. 28 and 30, T. 12 N., R. 5 E., M. D. B. and M. For irrigation and domestic purposes (700 acres). Estimated cost \$500.

**MODOC COUNTY**—Application 7458. Frank McArthur, Alturas, Cal., for 1155 acre-feet per annum from Fitzhugh Creek, tributary to South Fork Pit River, to be diverted in Sec. 23, T. 41 N., R. 13 E., M. D. B. and M. For irrigation, domestic and stock-watering purposes (1240 acres).

**HUMBOLDT COUNTY**—Application 7459. Ralph Coleman, Salyer Creek, for 0.01 c.f.s. from Unnamed Spring, tributary to Trinity River, to be diverted in Sec. 16, T. 6 N., R. 5 E., H. B. and M. For domestic purposes. Estimated cost \$225.

**ELDORADO COUNTY**—Application 7460. B. W. Stone, 161 Ellis Street, San Francisco, Cal., for 500 c.f.s. and 125,000 acre feet per annum from Rubicon River, Pilot Creek, Gerle Creek, Loon Lake, Buck Island Lake, Rockbound Lake and Little South Fork of Rubicon River, tributary to American River Drainage Area, to be diverted in Sec. 9, T. 13 N., R. 16 E.; Sec. 11, T. 12 N., R. 13 E.; Sec. 24, T. 13 N., R. 13 E.; Secs. 11, 31, 34, T. 14 N., R. 14 E.; Sec. 4, T. 13 N., R. 15 E., and Sec. 2, T. 13 N., R. 14 E., M. D. B. and M. For municipal purposes.

**LASSEN COUNTY**—Application 7461. R. R. Richmond, 1515 Market Street, Oakland, Cal., for 0.07 c.f.s. from 6 unnamed hot springs tributary to Pit River Drainage Area, to be diverted in Sec. 14, T. 38 N., R. 8 E., M. D. B. and M. For recreational and domestic purposes. Estimated cost \$500.

**ORANGE COUNTY**—Application 7462. George H. Veeh, c/o Geo. L. Bates, Engineer, Abstract & Title Insurance Bldg., Santa Ana, Calif., for 46 acre-feet per annum from unnamed gulch, tributary to Newport Bay, to be diverted in Sec. 29, T. 6 S., R. 8 W., S. B. B. and M. For irrigation and domestic purposes (43 acres).

**LOS ANGELES COUNTY**—Application 7463. G. H. Burkhart, 2681 Longwood Ave., Los Angeles, Cal., for 200 acre-feet per annum, from Middle Fork of Palmett Creek, tributary to Big Rock Creek, to be diverted in Sec. 23, T. 4 N., R. 10 W., S. B. B. and M. For irrigation and domestic purposes (150.25 acres).

**LOS ANGELES COUNTY**—Application 7464. G. L. Poser and Hyman Levin, c/o Hyman Levin, 525 North Mission Road, Los Angeles, Cal., for 0.025 c.f.s. from unnamed spring, tributary to Middle Fork Palmett Creek, to be diverted in Sec. 23, T. 4 N., R. 10 W., S. B. B. and M. For irrigation and domestic purposes (48½ acres). Estimated cost \$1000.

**LOS ANGELES COUNTY**—Application 7465. G. L. Poser and Hyman Levin, c/o Hyman Levin, 525 North Mission Road, Los Angeles, Cal., for 200 acre-feet per annum from Middle Fork Palmett Creek, tributary to Big Rock Creek, to be diverted in Sec. 23, T. 4 N., R. 10 W., S. B. B. and M. For irrigation and domestic purposes (60 acres).

**LOS ANGELES COUNTY**—Application 7466—Department of Public Works, Division of Highways, Public Works Bldg., Sacramento, Cal., for 0.003 c.f.s. from unnamed spring, tributary to Piru Creek, to be diverted in Sec. 2, T. 6 N., R. 18 W., S. B. B. and M. For industrial and domestic purposes.

**NEVADA COUNTY**—Application 7467. Walter N. Sim, Nevada City, Cal., for a total of 1000 miners' inches from (1) South Fork Yuba River, tributary to Yuba River, and (2) Diamond Creek, tributary to South Fork Yuba River, to be diverted in (1) Sec. 18, T. 17 N., R. 12 E., and (2) Sec. 10, T. 17 N., R. 11 E., M. D. B. and M. For power and domestic purposes (1140 h.p.). Estimated cost \$15,000.

**NEVADA COUNTY**—Application 7468. Walter N. Sim, Nevada City, Cal., for 1000 miners' inches from South Fork Yuba River, tributary to Yuba River, to be diverted in Sec. 18, T. 17 N., R. 12 E., M. D. B. and M. For mining and domestic purposes. Estimated cost \$8,000.

**LOS ANGELES COUNTY**—Application 7469. Properties, Inc., c/o Seaboard Engineering and Contracting Co., 404 Douglas Bldg., 257 South Spring Street, Los Angeles, Cal., for 0.001 c.f.s. and 100,000 gallons per annum from unnamed spring, tributary to Piru Creek, to be diverted in Sec. 30, T. 6 N., R. 17 W., S. B. B. and M. For irrigation and stock-watering purposes (60 acres).

**DEL NORTE COUNTY**—Application 7470. G. M. Willoughby and Daisy V. and Clark Terwilliger, c/o Clark Terwilliger, Crescent City, Cal., for 3 c.f.s. from Cedar Springs, tributary to Smith River, to be diverted in Sec. 36, T. 17 N., R. 2 E., H. B. and M. For mining purposes. Estimated cost \$25.

**DEL NORTE COUNTY**—Application 7471. G. M. Willoughby and Daisy V. and Clark Terwilliger, c/o Clark Terwilliger, Crescent City, Cal., for 3 c.f.s. from Fork of Coon Creek, tributary to Smith River, to be diverted in Sec. 36, T. 17 N., R. 2 E., H. B. and M. For mining purposes. Estimated cost \$50.

**PLUMAS COUNTY**—Application 7472. J. La Rue Robinson and Elizabeth Evans Robinson, 539 Riverside Drive, Reno, Nev., for 500 acre-feet per annum from Taylor Lake, tributary to Hungry Creek, thence Indian Creek, to be diverted in Sec. 35, T. 27 N., R. 11 E., M. D. B. and M. For irrigation and stock-watering purposes (510 acres).

**MENDOCINO COUNTY**—Application 7473. Heath Angello, Branscomb, Cal., for 2.5 c.f.s. from Elder

# Water Permits Issued in December

(Continued from preceding page)

Creek, tributary to South Fork Eel River, to be diverted in Sec. 23, T. 22 N., R. 16 W., M. D. B. and M. For power purposes (ram). Estimated cost \$560.

**SAN JOAQUIN COUNTY**—Application 7474. C. B. Orvis and Wm. S. Orvis, 927 North Harrison Street, Stockton, Cal., for 6.0 c.f.s. from Upland Canal, tributary to Sycamore Slough, thence South Fork Mokelumne River, to be diverted in Sec. 33, T. 4 N., R. 5 E., M. D. B. and M. For irrigation purposes (303.89 acres). Estimated cost \$5,500.

**LOS ANGELES COUNTY**—Application 7475. J. F. Hutak, Littlerock, Cal., for 0.025 c.f.s. from Spring, tributary to Mojave Desert, to be diverted in Sec. 13, T. 4 N., R. 10 W., S. B. B. and M. For irrigation and domestic purposes (10 acres). Estimated cost \$250.

**HUMBOLDT COUNTY**—Application 7476. Domingo Silva, Jr., and William Silva, c/o W. A. Beer, Arcata, Cal., for 3.60 c.f.s. from Mad River, tributary to Pacific Ocean, to be diverted in Sec. 7, T. 6 N., R. 1 E., H. B. and M. For irrigation purposes (100 acres). Estimated cost \$2,600.

**SAN DIEGO COUNTY**—Application 7477. James K. Banes, Route No. 1, Box 309B, Escondido, Cal., for 5 acre-feet per annum from unnamed stream, tributary to San Dieguito River, to be diverted in Sec. 13, T. 13 S., R. 1 W., S. B. B. and M. For irrigation and domestic purposes (6 acres). Estimated cost \$300.

## PERMITS ISSUED

Permits to appropriate water issued by the Department of Public Works, Division of Water Resources during the month of December, 1932.

**MONO COUNTY**—Permit 4032, Application 7285. George J. Davlin, 5157 8th Avenue, Los Angeles, Cal., December 3, 1932, for 100 gallons per day from unnamed stream, tributary to Twin Lakes and Owens River, in Sec. 9, T. 4 S., R. 27 E., M. D. B. and M. For domestic purposes. Estimated cost \$60.

**RIVERSIDE COUNTY**—Permit 4033, Application 7296. Chapman Blackburn, Hemet, Cal., December 3, 1932, for 3,000 gallons per day from unnamed stream, tributary to San Jacinto River watershed in Sec. 30, T. 5 S., R. 1 E., S. B. B. and M. For domestic and stock-watering purposes. Estimated cost \$200.

**MARIPOSA COUNTY**—Permit 4034, Application 7338. John C. McGarry, Incline, Cal., December 3, 1932, for 0.22 c.f.s. from Cranberry Gulch, tributary to Merced River, in Sec. 22, T. 3 S., R. 19 E., M. D. B. and M. For mining and domestic purposes. Estimated cost \$400.

**INYO COUNTY**—Permit 4035, Application 7292. Joseph W. Rossi, Bishop, Cal., December 6, 1932, for 0.50 c.f.s. from Crystal Spring, tributary to Owens River watershed, in Sec. 26, T. 7 S., R. 32 E., M. D. B. and M. For irrigation and domestic purposes on 22½ acres. Estimated cost \$1,500.

**HUMBOLDT COUNTY**—Permit 4036, Application 7361. Charles Doss, Orleans, Cal., December 6, 1932, for 3.00 c.f.s. from Red Cap Gulch, tributary to Klamath River in Sec. 9, T. 10 N., R. 5 E., H. B. and M. For hydraulic mining. Estimated cost \$1,000.

**SIERRA COUNTY**—Permit 4037, Application 7383. Clifford A. Thompson, Sierra City, Cal., December 7, 1932, for 3.00 c.f.s. from Howard Creek, tributary to North Fork North Fork Yuba River, in Sec. 26, T. 21 N., R. 12 E., M. D. B. and M. For mining purposes. Estimated cost \$500.

**SISKIYOU COUNTY**—Permit 4038, Application 7396. Helen Russell Prince, 726 Sutter Street, San Francisco, Cal., December 7, 1932, for 0.50 c.f.s. from North Fork Russian Creek, tributary to North Fork Salmon River, in Sec. 19, T. 40 N., R. 10 W., M. D. B. and M. For irrigation and domestic use on 11½ acres. Estimated cost \$200.

**TEHAMA COUNTY**—Permit 4039, Application 7371. State of California, Department of Public Works, Division of Highways, of Sacramento, Cal., December 16, 1932, for 0.605 c.f.s. from unnamed

spring, tributary to South Fork Battle Creek, thence Sacramento River, in Sec. 24, T. 29 N., R. 3 E., M. D. B. and M. For domestic and fire protection uses. Estimated cost \$1,100.

**MONO COUNTY**—Permit 4040, Application 7355. Charles E. Day, Bridgeport, Cal., December 10, 1932, for 0.02 c.f.s. from Mono Lake Jim Spring, tributary to Upper Twin Lake, thence Robinson Creek and East Walker River, in Sec. 6, T. 3 N., R. 24 E., M. D. B. and M. For domestic and lawn purposes. Estimated cost \$300.

**DEL NORTE COUNTY**—Permit 4041, Application 7321. Carl Bruno, Klamath, Cal., December 12, 1932, for 0.075 c.f.s. from 2 unnamed streams, tributary to small stream that flows into Pacific Ocean about 1 mile below, in Sec. 20, T. 14 N., R. 1 E., H. B. and M. For power purposes. Estimated cost \$2,500.

**DEL NORTE COUNTY**—Permit 4042, Application 7322. Carl Bruno, Klamath, Cal., December 12, 1932, for 0.037 c.f.s. from 3 unnamed streams tributary to small stream that flows into Pacific Ocean 1 mile below, in Sec. 20, T. 14 N., R. 1 E., H. B. and M. For domestic and recreational purposes. Estimated cost \$2,000.

**MONO COUNTY**—Permit 4043, Application 7359. Gilbert C. Wedertz, Bridgeport, Calif., December 14, 1932, for 200 gallons per day from unnamed spring, tributary to Upper Twin Lake, thence Robinson Creek and East Walker River, in Sec. 6, T. 3 N., R. 24 E., M. D. B. and M. For domestic purposes and garden irrigation. Estimated cost \$76.

**INYO COUNTY**—Permit 4044, Application 3759. City of Los Angeles, Los Angeles, Cal., December 17, 1932, for 20 c.f.s. and 18,565 acre-feet per annum from Baker Creek and Sanger Meadow Fork of Baker Creek, in Secs. 15, 11 and 13, T. 9 S., R. 32 E., M. D. B. and M. For power purposes in Los Angeles, 9,646 t.h.p. to be developed. Estimated cost \$750,000.

**SISKIYOU COUNTY**—Permit 4045, Application 7333. Wm. A. Paxton, Los Angeles, Cal., December 19, 1932, for 2 c.f.s. from Deadwood Creek, in Sec. 20, T. 45 N., R. 8 W., M. D. B. and M. For power and domestic use. ¼ t.h.p. to be developed. Estimated cost \$100.

**SISKIYOU COUNTY**—Permit 4046, Application 7342. George Steiner and Jack R. O'Donovan, Happy Camp, Cal., Dec. 22, 1932, for 1 c.f.s. from Cole Creek, in Sec. 10, T. 17 N., R. 6 E., H. B. and M. For mining purposes. Estimated cost \$50.

**MONO COUNTY**—Permit 4047, Application 7354. Mrs. Louise M. Green, Arcadia, Cal., December 27, 1932, for 200 gallons per day from unnamed stream in Sec. 9, T. 4 S., R. 27 E., M. D. B. and M. For domestic use. Estimated cost, \$50.

**PLACER COUNTY**—Permit 4048, Application 7334. U. S. Tahoe National Forest, Nevada City, Cal., December 27, 1932, for 32,500 gallons per day from Brockway Tract Springs, in Sec. 12, T. 16 N., R. 17 E., M. D. B. and M. For domestic and fire protection. Estimated cost \$750.

## GOT THE WORKS

"Before Amos was married he said he would be the boss or know the reason why."

Chester: "And now?"

Ralph: "He knows the reason why."—*Lindsay Post.*

Driver of Lorry—Sound your 'orn, missus.  
Lady Driver—Sound your 'atches.

She—We really should get a new car this year.

He—What! When I'm still paying installments on the car I sold in part payment for the car I traded for the car I've got now?

## Vital Statistics on Dam Applications and Improvements

### APPLICATIONS FILED

Applications for approval of dams built prior to August 14, 1929, filed with the State Department of Public Works, Division of Water Resources during the month of December, 1932.

**LASSEN COUNTY**—Bailey Creek Dam, No. 1227. J. B. Leavitt, Susanville, owner; earth, 12 feet above streambed, situated on Bailey Creek in Sec. 15, T. 34 N., R. 12 E., M. D. B. and M. For storage purposes for fish pond use.

**MADERA COUNTY**—Sierra Vista Dam No. 681. Sierra Vista Vineyard Company, Chowchilla, owner; earth, 5 feet above streambed with a storage capacity of 90 acre-feet, situated on Chowchilla River, tributary to San Joaquin River in Sec. 13, T. 9 S., R. 15 E., M. D. B. and M. For diversion purposes for irrigation use.

Applications for approval of plans and specifications for construction or enlargement of dams filed with the State Department of Public Works, Division of Water Resources during the month of December, 1932.

**MODOC COUNTY**—Bayley Dam No. 128-3. Frank McArthur; Christensen and Humphrey, Likely, owners; earth, 11 1/2 feet above streambed situated on Crook Canyon, tributary to Pit River in Sec. 32, T. 40 N., R. 12 E., M. D. B. and M. For storage purposes for irrigation use. Estimated cost \$2,000, fees paid \$20.

**PLACER COUNTY**—Paragon Dam No. 328. Paragon Gravel Mine, Forest Hill, owner; boulders and cobbles, 25 feet above streambed situated on Volcano Canyon, tributary to North Fork Middle Fork American River in Sec. 31, T. 14 N., R. 11 W., M. D. B. and M. For storage of debris. Estimated cost less than \$2,000, fee paid \$20.

Applications for approval of plans and specifications for repair or alteration of dams filed with the State Department of Public Works, Division of Water Resources during the month of December, 1932.

**ALAMEDA COUNTY**—Durant Dam No. 593. Bank of America N. T. & S. A., Oakland, owner; earth, situated on Durant Estate, East Oakland.

**VENTURA COUNTY**—Lake Sherwood Dam No. 765. Lake Sherwood Country Club, Hollywood, owner; slab and buttress, situated on Triunfo Creek, tributary to Malibu Creek in Sec. 27, T. 1 N., R. 19 W., S. E. B. and M.

### PLANS APPROVED

Plans and specifications for the construction or enlargement of dams approved by the State Department of Public Works, Division of Water Resources during the month of December, 1932.

**SAN DIEGO COUNTY**—Keen Valley Dam No. 846. Sweetwater Fruit Company of California, Bonita, owner; earth, 22 feet above streambed with a storage capacity of 50 acre-feet, situated on Keen Valley Wash, tributary to Sweetwater River, located in quarter-section 75, Rancho del a Nation. For storage purposes for flood control and irrigation use.

Plans for the repair or alteration of dams approved by the State Department of Public Works, Division of Water Resources during the month of December, 1932.

**ALAMEDA COUNTY**—Durant Dam No. 593. Bank of America, N. T. & S. A., Oakland, owner; earth, located in East Oakland.

"Do you think," said the intellectual young woman, "that there is any truth in the theory that big creatures are better-nurtured than small ones?"

"Yes," answered the young man, "I do. Look at the difference between the Jersey mosquito and the Jersey cow."—*Georgia Highways*.

## Cut in Federal Aid Threatens Boost in Taxes on Property

"AMERICAN land owners face a serious hazard in the stampede of Congress to 'economy at any price'" declared C. H. Moorefield, president of the American Association of State Highway Officials, in a statement issued today. The proposal to make drastic cuts in Federal Aid to State highways was specified by Mr. Moorefield as a potential danger to the owners of property.

"Decreases in Federal aid, coupled with the practice of gas tax diversion within individual states, will inevitably throw an increased burden on the already overburdened property owners," Mr. Moorefield stated. "As Secretary of Agriculture Arthur M. Hyde recently pointed out, decreased road income means defaulted bonds which, in turn, will force the states to increase property taxes in order to preserve their credit.

"To safeguard present highway investments and to continue the much needed extension of State highways, the Congress must continue the appropriation for each of the fiscal years of 1934 and 1935."

"Heedless reduction of Federal aid for highways," Mr. Moorefield added, "will serve to throw out of employment many of the more than 330,000 men regularly employed in road work. Those men and their families will tend to become dependent on public relief funds; larger diversions may then be made from gas tax income, highways will become static and the ultimate burden will fall back on the already harassed property owner."

### THROUGH TRAFFIC PROBLEM

The danger of picking out the main street of a town and arbitrarily making it a through street, as pointed out in recent studies by the National Safety Council, has recently been emphasized in several Illinois towns.

Petitions have been received by the State Highway Commission, from representatives of small towns and villages asking that State roads be rerouted so that the constant stream of traffic may be diverted from their centers.

According to the representatives, it was once thought advantageous to bring as much traffic into the main street as possible, for transient trade meant increased business. The flow of cars, however, has become so great and the rate at which they travel so rapid that it actually hampers the transaction of local business.

Even large cities are now finding that the most successful system shunts non-stop traffic around the business district to avoid congestion in the down-town centers.—*New Mexico Magazine*.



## Highway Projects in 1933-35 Budget

(Continued from page 1)

In making recommendations for the proposed budget, a determined effort has been made to use the utmost economy in providing for and maintaining adequate traffic service over the entire system of highways and to apply funds where most urgently needed.

At the end of the present biennium, all the funds available during the 1931-33 period will have been expended, such revenue having been put to immediate use as soon as received for maximum employment needed under present conditions.

### BAY BRIDGE FUNDS

For building the approaches to the San Francisco-Oakland Bay Bridge, \$1,500,000 for grading and paving is set up as an allotment to cover that project.

A total allotment of \$2,950,000 for convict labor camps is to be used for the maintenance of these camps and carrying on of construction in various of the northern 45 counties, such as the Feather River Highway, the Carmel-San Simeon Highway in Monterey County, the Alturas Lateral, the Trinity Lateral, and the Kings River Highway in Fresno County.

There is set up for cooperative city projects, in the northern 45 counties, \$1,442,280; and in the southern 13 counties, \$2,440,532. These appropriations are to cover the State's share of work on State highway routings through incorporated cities.

Construction and reconstruction projects included in the budget, as submitted, are as follows:

### ROUTE 1, REDWOOD HIGHWAY

(San Francisco to the Oregon State Line)

**SONOMA AND MENDOCINO COUNTIES**—From Cloverdale to Hopland, 13.8 miles, \$652,500, for grading, paving, bridges and grade separations. This allotment will provide additional improvement necessary to open the road to traffic. Grading of the road was undertaken in the current biennium on this new routing, which saves  $1\frac{1}{2}$  miles in distance and substitutes light, wider grade and excellent alignment for long stretches of maximum grade and low standard alignment.

**MENDOCINO COUNTY**—Rattlesnake Bridge and approaches, 0.6 miles, \$66,800, for the construction of a bridge and the grading and surfacing of the approaches. The old timber structure is becoming dangerous and has outlived its usefulness. It must be replaced.

**MENDOCINO AND HUMBOLDT COUNTIES**—County line bridge and approaches, 1.2 miles, \$211,900, for the

construction of a bridge and the grading and surfacing of the approaches. This bridge is dangerous because of the failures of various members in the bridge which have been temporarily repaired. It must be replaced; and in replacing it, more adequate approaches on better standard of alignment and grade will be constructed.

### Humboldt County

Smith Ranch to Twin Trees, 0.7 mile, \$116,800, for the construction of a bridge and the grading and surfacing of the approaches. The Twin Trees Bridge is in dangerous condition, and the approaches to the present bridge are dangerous and crooked with sharp curvature. The construction of a new bridge with improved alignment for the approaches is planned.

Benbow to 7 miles north of Garberville, 7.5 miles, \$575,800, for grading, surfacing and construction of bridges. This project consists of two sections; one from Benbow to Garberville and the other from Bluff Creek to 2 miles north of Dean Creek. This section of the Redwood Highway is one of the most dangerous, being narrow and crooked and on steep grades. Some of the heaviest traffic on the Redwood Highway is encountered on this section, and it must be reconstructed to better standards to eliminate the hazards.

Jordan Creek to South Scotia Bridge, 2 miles, \$102,100, for grading and surfacing. Relocation and improvement of this section at Brown's Mill will make a decided improvement in the alignment and distance.

Trinidad to Big Lagoon, 9 miles, \$80,000, for additional and improved surface. Present surface is failing because it is inadequate and, consequently, requires a high maintenance expenditure.

Feather River Bridge and approaches, 0.5 mile, \$73,300, for the construction of a bridge and the grading and surfacing of the approaches. The present old concrete structure is failing and is in dangerous condition. It is narrow and should be rebuilt to properly carry traffic and to provide safety.

Redwood Creek Bridge, \$9,000, for the construction of a sidewalk. Pedestrians and school children who daily cross this bridge are endangered by having to use the roadway portion of the bridge at the present time. A sidewalk must be constructed.

### Del Norte County

Last Chance Slide to Flannigan's, 9.2 miles, \$565,700, for grading. This section of highway includes the road through the State park, known as Graves Grove, and over the Del Norte Bluffs. It is narrow and dangerous, with poor alignment and heavy grade. It is the only remaining section in Del Norte County presenting the most hazardous condition on the Redwood Highway north of the Klamath River.

Oregon Mountain Summit to the State line, 4.2 miles, \$37,500, for surfacing. This section lies in snow country, and the present surface is inadequate to support traffic.

### ROUTE 2, COAST HIGHWAY

(San Francisco to Mexican Line)

**SAN MATEO COUNTY**—San Mateo to Redwood City, 4.9 miles, \$435,000, for grading and paving. Large traffic volume on this highway requires the widening of the pavement and resurfacing of the existing pavement to strengthen it.

**Monterey County**

Chualar to 6 miles south of Gonzales, 11 miles, \$381,000, for grading and paving. This allotment provides for the reconstruction and resurfacing of a portion of the original 15-foot light type pavement built many years ago.

From a point 6 miles south of San Ardo to Bradley, 5.6 miles, \$339,500, for grading, paving and construction of bridges. The present 15-foot thin type pavement built years ago is rapidly failing and is inadequate to properly serve traffic.

King City to Greenfield, 11.1 miles, \$369,000, for grading and paving. This is another section of 15-foot light type pavement no longer adequate to serve traffic and rapidly failing.

SAN LUIS OBISPO COUNTY—Pismo to San Luis Obispo, portions, 2.1 miles, \$77,500, for paving. This allotment is to cover the cost of paving gaps which were originally left where high fills have been constructed, allowing for their settlement.

**Santa Barbara County**

Santa Maria to Santa Maria River, 0.7 miles, \$27,000, for grading and paving. This is a short section of old 15-foot pavement which should be resurfaced and widened.

Richfield Tower to Santa Maria, 1.5 miles, \$62,000, for grading and paving. This is the remaining narrow section of 15-foot pavement connecting with the reconstructed State highway through Solomon Canyon.

Nojoqui Grade, 3.7 miles, \$479,000, for the grading, paving and construction of bridges. This section of State highway carrying heavy traffic is narrow, has poor alignment with many sharp curves and steep grades.

Tajiguas to Arroyo Quemado, 1.4 miles, \$60,000, for grading and paving. On this section, the State Highway and the following one, the present road makes sharp and abrupt dips on steep grades and poor alignment into the many canyons along this section of the coast. This hazardous condition is to be remedied.

Arroyo Hondo to Gaviota, 5.3 miles, \$315,000, for grading and paving.

Hollister Avenue Subway to Santa Barbara, 1.6 miles, \$113,800, for grading and paving. This is a connection outside of the city of Santa Barbara to the proposed new through route through that city.

Ortega Hill and San Ysidro Road to Santa Barbara, 1.9 miles, \$147,000, for grading and paving. Widening of the pavement over Ortega Hill to eliminate hazards and through Montecito approaching Santa Barbara to adequately serve heavy traffic, is necessary.

**Ventura County**

Ventura to Westerly Boundary, 12 miles, \$672,000, for grading and paving. The present 20-foot road has reached its capacity and must be widened to properly serve traffic.

Stallo to Santa Clara River, 3.4 miles, \$72,000, for grading and paving. This is a short section of old 15-foot pavement which requires resurfacing and widening.

Southerly Boundary to Newbury Park, portions, 1.2 miles, \$40,000, for grading and paving. Sharp curvature offering hazardous conditions to large volume of traffic should be corrected.

LOS ANGELES COUNTY—Calabasas to West Boundary, portions, 3.3 miles, \$132,000, for grading and paving. Much needed correction on poor alignment offering hazards to traffic is provided by this allotment.

ORANGE COUNTY—Trabuco Creek, \$26,000, for the construction of a bridge. This bridge is structurally dangerous and requires replacement.

**San Diego County**

Santa Margarita River Bridge, \$200,000, for the construction of a new bridge. This bridge is failing and requires replacement.

Oceanside to San Mateo Creek, 18 miles, \$479,000, for grading, paving and bridge construction. Large increase in traffic requires widening of the pavement.

Del Mar to Oceanside, 16.4 miles, \$535,000, for grading, paving and bridge construction. This section of State highway also requires widening, due to the large increase in traffic.

National City to San Ysidro, 10 miles, \$285,000, for grading and paving. This is part of the heavily traveled road from San Diego to the Mexican Boundary and requires improvement to adequately serve traffic.

**ROUTE 3, PACIFIC HIGHWAY**

(Sacramento to Oregon State Line—East Side)

YUBA COUNTY—Wheatland to Morrison's Crossing, 2.5 miles, \$117,000, for grading, paving and construction of bridges. This is a section of narrow 15-foot thin type pavement subject to overflow, which is to be reconstructed and widened.

TEHAMA COUNTY—South Boundary to Red Bluff, 26.5 miles, \$250,000, for grading and surfaced shoulders. The existing 15-foot pavement is to be widened by the construction of adequate surfaced shoulders and by widening the grade.

SHASTA COUNTY—Redding to Sulphur Creek, 1.0 miles, \$253,000, for the construction of a bridge and grading and surfacing of the approach road. This project, in connection with the improvement through the town of Redding, will provide a new crossing of the Sacramento River and a shortening of the distance by about 1 mile.

SISKIYOU COUNTY—At Big Canyon, 0.8 mile, \$86,500, for grading and surfacing. A very hazardous short section, involving sharp curvature, is to be corrected.

BUTTE COUNTY—Pine Creek Bridge and approaches, \$25,300, for construction of a bridge and grading and paving of the approaches. This bridge is inadequate and dangerous for present traffic and must be replaced.

**ROUTE 4, GOLDEN STATE HIGHWAY**

(Valley Road—Sacramento to Los Angeles)

SACRAMENTO COUNTY—Sacramento to McConnell, \$27,000, for the construction of bridges. Recent reconstruction and widening of the road requires widening of the existing bridges, which is contemplated by this allotment.

STANISLAUS COUNTY—One-half mile south to three-fourths mile north of Turlock, 1.3 miles, \$65,000, for grading and paving. This project, in connection with a proposed improvement for a new through routing through the city of Turlock, will materially benefit a large volume of through traffic.

MADERA COUNTY—Ash Slough, \$40,000, for the construction of a bridge. Present structure is weak and dangerous and requires replacement.

FRESNO COUNTY—Selma to Fowler Switch Canal, 1.8 miles, \$85,300, for grading and paving. This section of narrow, old pavement should be widened and resurfaced to properly serve traffic.

KERN COUNTY—One to two miles south of Delano, 1 mile, \$37,000, for grading and paving. This short section of highway requires resurfacing where the old pavement is failing.

KERN COUNTY—South Boundary to Oak Glen, 6.8 miles, \$752,000, for grading, paving and bridge con-

struction. This section will complete the remaining gap in the reconstructed State highway from Los Angeles to Bakersfield.

**LOS ANGELES COUNTY**—Santa Clara River to Castaic School, 5.4 miles, \$150,000, for grading and paving. The present road requires widening to properly accommodate large volume of traffic. It connects with the new relocated Ridge Route.

**LOS ANGELES COUNTY**—Near Newhall to Saugus, 3.2 miles, \$75,000, for grading, paving and construction of bridges. This allotment contemplates the reconstruction of the remaining section of the road between Newhall and Saugus.

#### **ROUTE 5, VIA OAKLAND** (Stockton to Santa Cruz)

**SAN JOAQUIN COUNTY**—French Camp to McKinley Avenue, 3.5 miles, \$122,000, for paving. Grading and temporary surfacing have been completed, and pavements should now be placed.

**ALAMEDA COUNTY**—Oakland to 1.3 miles south, 1.3 miles, \$104,300, for grading, paving and bridge construction. This short section of highway immediately south of the city limits of Oakland is necessary to complete the proposed improvement of a cooperative routing within the city.

**SANTA CRUZ COUNTY**—Inspiration Point to Scott Valley, 6.7 miles, \$277,000, for grading and surfacing. This allotment will complete the relocation of this heavily traveled road between Inspiration Point and Scott Valley and open the road to traffic.

**SANTA CRUZ COUNTY**—Scott Valley to 1 mile north of Santa Cruz, 3.9 miles, \$300,000, for grading and surfacing. This project, together with the previous one, opens up the entire routing and provides for the reconstructed highway between Inspiration Point and Santa Cruz.

#### **ROUTES 6 AND 7** (Sacramento to Oakland)

**YOLO AND SACRAMENTO COUNTIES**—At Sacramento, \$433,000, for the construction of a bridge. This allotment contemplates the construction of a new bridge across the Sacramento River, at the entrance of the city of Sacramento, under a cooperative agreement between the State, Sacramento County and the city of Sacramento.

**YOLO COUNTY**—Causeway to M Street Subway, 3.5 miles, \$122,000, for grading and paving. This improvement is necessary to accommodate the increased traffic on this road and to connect the widened causeway, now under construction, with the city.

**YOLO COUNTY**—West approach to the causeway, 0.1 miles, \$6,000, for grading and paving. The widened causeway now under construction requires the widening of the west approach.

**SOLANO COUNTY**—Five and five-tenths miles north of Fairfield to 1 mile south of Vacaville, 3.3 miles, \$172,000, for grading, paving and construction of bridges. This allotment contemplates reconstruction of a section of highway with very inferior alignment and on which a considerable saving in distance can be accomplished.

**SOLANO COUNTY**—Benicia-Vallejo Road to Cordelia, 11 miles, \$400,000, for grading. This is the so-called American Canyon Routing, which will save 4½ miles in distance between Sacramento and Oakland and provide an adequate through routing for a large volume of traffic.

**SOLANO COUNTY**—One mile north of Carquinez Bridge to Vallejo-Benicia Road, 1.5 miles, \$59,000,

for grading. This is a section of the American Canyon Routing.

#### **ROUTE 7, PACIFIC HIGHWAY** (West Side, Davis Wye to Red Bluff)

**COLUSA COUNTY**—Maxwell to Northerly Boundary, 8 miles, \$381,000, for grading, paving and construction of bridges. The present narrow 15-foot thin type pavement requires resurfacing and widening.

#### **ROUTE 8, IGNACIO TO NAPA** (Black Point Cutoff)

**SONOMA COUNTY**—Foster line change, 0.9 mile, \$60,000, for grading and surfacing. This short section of the Black Point Cutoff presents considerable hazards due to poor and inadequate alignment and should be corrected.

#### **ROUTE 9, FOOTHILL BOULEVARD** (San Fernando to San Bernardino)

**LOS ANGELES COUNTY**—Big Tujunga Wash to Tujunga, 3.3 miles, \$114,000, for grading, paving and bridge construction. This highway must be widened to adequately serve large traffic volume.

#### **ROUTE 10, SIERRA-TO-THE-SEA HIGHWAY** (San Lucas to Sequoia National Park)

**MONTEREY COUNTY**—San Lorenzo Creek to Priest Valley School, portions, 9.1 miles, \$150,000, for grading. Construction and realignment of a portion of the Mustang Grade is contemplated.

**TULARE COUNTY**—Visalia to Merryman, 9.9 miles, \$340,000, for grading, paving and bridge construction. The present narrow 15-foot pavement must be widened and resurfaced to adequately serve traffic.

#### **ROUTE 11, PLACERVILLE-TAHOE HIGHWAY**

**EL DORADO COUNTY**—Kyburz to Strawberry, 9 miles, \$115,000, for surfacing. Grading of this section is being undertaken by the Bureau of Public Roads with Forest Highway funds and, together with the grading contemplated in the next item, requires surfacing when completed.

**EL DORADO COUNTY**—Fred's Place to 2.2 miles easterly, 2.2 miles, \$100,000, for grading. The construction of this remaining section will eliminate some of the worst alignment and grade on this important highway.

#### **ROUTE 12, SAN DIEGO-EL CENTRO HIGHWAY**

**SAN DIEGO COUNTY**—El Cajon easterly, 1.2 miles, \$28,000, for grading and paving. This short section of 15-foot thin type pavement east of El Cajon should be widened and resurfaced to properly care for traffic.

#### **ROUTE 15, TAHOE-UKIAH HIGHWAY**

**PLACER AND NEVADA COUNTIES**—Spaulding Canal to Route 37, 4.1 miles, \$190,000, for grading and surfacing. The construction of this section will complete a connection from the Tahoe-Ukiah Road to the Auburn-Truckee Road leading to the State line and make it possible for traffic to use this important State artery.

**NEVADA COUNTY**—1 mile west of Washington Road to ½ mile east of summit, 7.4 miles, \$110,000, for surfacing. Grading has been completed and an adequate surface is necessary.

#### **ROUTE 18, YOSEMITE HIGHWAY**

**MARIPOSA COUNTY**—Orange Hill School to Mariposa, 15 miles, \$275,000, for surfacing. Grading has

been completed, and surfacing must be placed to make the road available for traffic.

**ROUTE 19, BEAUMONT TO RIVERSIDE**  
(Jack Rabbit Trail)

RIVERSIDE COUNTY—Beaumont to Riverside, portions, 19 miles, \$601,800, for grading, surfacing and structures. This allotment will provide for the reconstruction, straightening and improvement of the Jack Rabbit Trail.

**ROUTE 20, TRINITY LATERAL**  
(Redding to Arcata)

TRINITY COUNTY—Over Oregon Mountain, \$100,000, for grading. This allotment contemplates the improvement of a portion of this highway west of Weaver-ville.

TRINITY COUNTY—South Fork to Burst Ranch, portions, 10.3 miles, \$123,500, for grading and surfacing. This present section of highway is a one-way road, very dangerous for traffic and is to be widened and improved.

**ROUTE 21, FEATHER RIVER ROAD**  
(Oroville to Quincy)

BUTTE COUNTY—Jarboe Pass to Bardees Creek, 4 miles, \$425,000, for grading. This project and the next are both on the Feather River Highway and a part of the progressive improvement and construction necessary for opening this road to traffic.

PLUMAS COUNTY—North Fork Feather River, \$32,000, for the construction of a bridge.

**ROUTE 23, EAST OF SIERRA HIGHWAY**  
(Saugus to Markleeville)

LOS ANGELES COUNTY—Saugus to Williams' Ranch, portions, 0.6 mile, \$37,000, grading, paving and bridge construction. This and the following project contemplate correction of inferior alignment and resurfacing of the existing pavement.

LOS ANGELES COUNTY—Williams' Ranch to Seeley's Ranch, portions, 1.4 miles, \$70,000, for grading and paving.

LOS ANGELES COUNTY—The Oaks to Acton Road, 10.6 miles, \$152,000, for paving. The old pavement is in poor condition, requiring large maintenance expenditure and should be resurfaced.

LOS ANGELES AND KEEN COUNTIES—Lancaster to Mojave, 24 miles, \$220,000, for grading and paving. The present road is 15 feet wide, of thin type pavement and should be resurfaced and widened.

INYO COUNTY—South limits of Bishop to Birchim Canyon, 13.1 miles, \$170,000, for grading and surfacing. The present road and surface are inadequate to properly serve traffic.

**Mono County**

Crestview to 2.2 miles south of Rush Creek, \$181,000, for grading and surfacing. The existing highway is on inferior standard, lies in snow country and requires reconstruction and surfacing to make it adequate for traffic.

Mono Inn to 2.7 miles south, 2.7 miles, \$63,000, for grading and surfacing. This is a continuation of the improvement being carried northward in Mono County and will provide adequate standards for traffic, including surfacing of the road at present inadequate.

Sherwin Hill to Whiskey Creek, 3.5 miles, \$35,000, for grading and surfacing. This is another section of narrow and inadequate road which should be brought to proper standards.

Point Ranch to Dressler's Corner, 6.3 miles, \$117,180, for grading, surfacing and construction of bridges.

ALPINE COUNTY—Centerville Bridge to Markleeville, 6.6 miles, \$230,000, for grading, surfacing and construction of bridges.

**ROUTE 24, SAN ANDREAS LATERAL**

SAN JOAQUIN COUNTY—Lodi to Waterloo Road, 4.4 miles, \$121,000, for grading and paving. This section will carry improved construction from Waterloo Road into Lodi, connecting with the section built during the current biennium.

**ROUTE 26, LOS ANGELES TO EL CENTRO**  
(Via Ontario, Colton, Redlands)

LOS ANGELES COUNTY—At Del Monte, \$90,000, for grade separation.

LOS ANGELES COUNTY—Orange Avenue to Barranca Street, 4 miles, \$180,000, for grading and paving. This project carries forward the improvement now underway toward opening this important highway between Pomona and Los Angeles.

SAN BERNARDINO COUNTY—Ontario to Pomona, 2.1 miles, \$110,000, grading and paving. This project and the following one are sections of the so-called Valley Boulevard, the heavy traffic artery on which the present pavement is too narrow and light to properly serve traffic.

SAN BERNARDINO COUNTY—Sierra Avenue to Colton, 5.8 miles, \$200,000, for grading and paving.

SAN BERNARDINO COUNTY—San Timoteo Creek, \$38,000, for construction of a bridge and the grading and paving of the approaches. This bridge in its present position is inadequate to carry the storm waters, is of temporary construction and should be replaced.

RIVERSIDE COUNTY—Banning to Whitewater, 12.1 miles, \$70,000, for repairing dips. Many of these dips are sharp and abrupt and are dangerous for fast moving traffic. They are to be corrected.

RIVERSIDE COUNTY—South Boundary to Avenue 62, 14.3 miles, \$14,300, for surfaced shoulders. Oil adjacent to the pavement is sandy and dangerous for traffic turning out from the pavement. Surfaced shoulders are to be constructed to correct this condition.

IMPERIAL COUNTY—Trifolium Canal to 20-foot pavement, 3.2 miles, \$80,800, for grading and paving. The present narrow pavement, 16 feet in width, is to be widened to 20 feet.

IMPERIAL COUNTY—Arroyo Salado, Tule, Campbell Washes, and San Felipe Sand Dunes, \$80,700, for bridge construction and grading and paving. These bridges need reinforcement to carry the heavy truck loads operating between Imperial Valley and the Metropolitan Area.

IMPERIAL COUNTY—San Felipe Wash, \$20,000, for bridge construction. The present bridge is dangerous and inadequate and must be reconstructed.

IMPERIAL COUNTY—Trifolium Canal to North Boundary, 33 miles, \$93,000, for surfaced shoulders. Sandy soil adjacent to the pavement is dangerous to traffic.

**ROUTE 27, EL CENTRO TO YUMA HIGHWAY**

IMPERIAL COUNTY—Holtville to Highline Canal, 7 miles, \$28,000, for surfaced shoulders. On this project and the following one, surfaced shoulders are to be constructed to correct the hazardous condition which the sandy material outside of the pavement creates.

IMPERIAL COUNTY—East Highline Canal to Sand Hills, 21 miles, \$590,000, for grading, paving and surfaced shoulders. The pavement which is rough and broken is to be resurfaced in addition to surfacing shoulders.

IMPERIAL COUNTY—Araz to Yuma, 6.1 miles, \$6,100, for surfaced shoulders.

#### ROUTE 28, REDDING-ALTURAS LATERAL

SHASTA COUNTY—Diddy Hill to Montgomery Creek, 16.2 miles, \$55,000, for surfacing. This will provide a surfacing for the graded road now under construction or being completed.

MODOC COUNTY—Alturas to Cedarville, portions, 2.6 miles, \$81,000, for grading and surfacing. This provides for the improvement of a portion of the low standard and inadequate roadway over Cedarville Mountain.

#### ROUTE 29, RED BLUFF-SUSANVILLE LATERAL

TEHAMA COUNTY—Red Bluff to Dales, 13.8 miles, \$485,000, for grading and surfacing. This provides for the improvement of the remaining section on this lateral not yet constructed or brought to modern standards.

#### ROUTE 32, PACHECO PASS LATERAL (Califa to Gilroy)

MERCED COUNTY—West Boundary to foot of Pacheco Pass Grade, 3.3 miles, \$260,000, for grading and surfacing.

MERCED COUNTY—Santa Rita Slough and approaches, \$29,000, for the construction of a bridge and grading and paving of approaches. The present bridge is dangerous and inadequate and must be replaced.

#### ROUTES 37 AND 38, AUBURN-TRUCKEE HIGHWAY

(Victory Highway, Auburn to the Nevada State Line)

NEVADA AND PLACER COUNTIES—Yuba River to Soda Springs, 11 miles, \$25,000 for surfacing. The present surfacing in this heavy snow country is inadequate and failing and needs to be reinforced.

NEVADA COUNTY—West End Donner Lake to Route 38, 4.7 miles, \$160,000, for grading and surfacing. This is one of the remaining short sections on this important highway which has not yet been constructed to modern standards.

NEVADA COUNTY—Hinton to 5 miles easterly, 5.0 miles, \$100,000, for grading and surfacing. The present surface on this section between Truckee and the Nevada State Line is failing and must be reinforced.

#### ROUTE 38, LAKE TAHOE HIGHWAY (Meyers to Truckee)

PLACER COUNTY—Ward Creek Bridge and approaches, \$14,000, for the construction of a bridge and approaches. This bridge is dangerous and narrow and must be reconstructed.

#### ROUTE 40, TIOGA PASS LATERAL

MONO COUNTY—Yosemite Park Boundary to Mono Lake, portions, 15.3 miles, \$248,125, for grading.

#### ROUTE 43, NEWPORT TO SAN BERNARDINO MOUNTAINS LATERAL

SAN BERNARDINO COUNTY—Fawnskin easterly, 1 mile, \$25,000, for grading and surfacing. Sharp

curvature, poor alignment and narrow width of roadway produce hazards on this short section which is to be corrected.

SAN BERNARDINO COUNTY—San Bernardino to Arrowhead Springs, 1 mile, \$40,000, for grading and surfacing. This will carry the construction and reconstruction of this road to the city of San Bernardino.

ORANGE COUNTY—Santa Ana Canyon, portions, \$200,000, for grading and paving. This is to correct poor alignment in the canyon and to resurface existing pavement which is failing.

#### ROUTE 46, KLAMATH RIVER LATERAL

HUMBOLDT AND SISKIYOU COUNTIES—Weitchpec to Happy Camp, portions, \$100,000, for the construction of bridges and grading. Many of the old wooden bridges on this lateral are in dangerous condition and must be reconstructed.

#### ROUTE 48, McDONALDS TO NAVARRO LATERAL

MENDOCINO COUNTY—McDonalds to Navarro, portions, \$60,000, for grading, surfacing and construction of bridges. This allotment contemplates the reconstruction or construction of new bridges in place of the present dangerous and inadequate structures.

#### ROUTE 49, CALISTOGA-LOWER LAKE HIGHWAY

LAKE COUNTY—Middletown to 4 miles northerly, 4 miles, \$223,500, for grading, surfacing and construction of bridges.

#### ROUTE 53, RIO VISTA LATERAL (Lodi to Fairfield)

SOLANO COUNTY—At Fairfield, 0.7 mile, \$20,000, for grading and surfacing. The present connection entering Fairfield is hazardous and dangerous, crossing several railroad tracks and making a blind intersection. It is to be corrected.

#### ROUTE 56, CARMEL-SAN SIMEON HIGHWAY

MONTEREY COUNTY—Carmel to Carmel River, 1.5 miles, \$101,000, for grading, surfacing and construction of a bridge.

MONTEREY COUNTY—Big Sur to Molera Ranch, 4.7 miles, \$170,000, for grading. This is one of the incomplete sections which must be constructed to open the road to traffic.

MONTEREY COUNTY—South Boundary to Molera Ranch, \$307,500, for the construction of bridges. A large number of bridges on the sections being graded by convict labor must be constructed to make the road usable.

#### ROUTE 56, CUYAMA LATERAL

KERN COUNTY—Maricopa to West Boundary, 10.5 miles, \$250,000, for grading and surfacing. This section out of Maricopa over the summit to the county line is to be constructed to proper standards.

#### ROUTE 58, BAKERSFIELD-MOJAVE LATERAL

KERN COUNTY—Haypress Canyon to Bear Mountain Ranch, 6.0 miles, \$400,000, for grading and surfacing. This construction will replace the portion of the present road which is on lowest standards of grade and alignment.

**ROUTE 59, CAJON TO LANCASTER LATERAL**

SAN BERNARDINO COUNTY—Camp Cajon to West Boundary, 18.0 miles, \$240,000, for grading and surfacing. This allotment is to provide a connection and open this road to traffic on direct alignment.

**ROUTE 60, ROOSEVELT HIGHWAY**

(Serra to Oxnard)

LOS ANGELES COUNTY—Los Angeles west city limits to Beverly Boulevard, 0.6 mile, \$100,000, for grading, paving and structures. This and the following projects on this highway are to provide for necessary grading and paving to bring this road to an adequate standard to serve the large volume of traffic. This is one of the most heavily traveled roads in the State.

LOS ANGELES COUNTY—West Channel Road to Santa Monica, 0.2 mile, \$20,000, for grading, paving and structures.

LOS ANGELES COUNTY—Ramirez Canyon to Encinal Canyon and Las Flores Canyon to Winter Canyon, 8.8 miles, \$502,500, for grading, paving and construction of bridges.

LOS ANGELES COUNTY—Winter Canyon to Ramirez Canyon and Encinal Canyon to West Boundary, 10.8 miles, \$821,500, for grading, paving and construction of bridges.

VENTURA COUNTY—East Boundary to Little Sycamore Creek, 1.2 miles, \$35,000, for grading, paving and construction of bridges.

VENTURA COUNTY—At Big Sycamore Creek, 0.6 mile, \$65,000, for grading, paving and construction of bridge.

VENTURA COUNTY—Oxnard to Calleguas Creek, 8.1 miles, \$166,000, for grading, paving and bridge construction.

**ROUTE 61, ARROYO SECO ROAD**

LOS ANGELES COUNTY—Colby Canyon to Mt. Wilson Road, 4 miles, \$420,000, for grading and surfacing. This construction will carry a completed road to Red Box Divide, connecting with the Mt. Wilson Road.

**ROUTE 62, SAN GABRIEL CANYON ROAD**

LOS ANGELES COUNTY—San Gabriel Canyon, \$113,000, State's share of cooperative grading. The major portion of this road is being constructed by Los Angeles Flood Control, City of Pasadena and the Forest Service to clear the proposed dams to be constructed in this canyon, the State participating to the extent of this allotment in work north of this construction.

**ROUTE 64, INDIO-BLYTHE HIGHWAY**

(U. S. Route 60)

RIVERSIDE COUNTY—Colorado River Bridge, \$4,688, State's share on the interest of the purchase of the bridge.

RIVERSIDE COUNTY—Near Shaver's Summit westerly, 12.0 miles, \$20,000, for oil surfacing.

RIVERSIDE COUNTY—Inyo to 12.5 miles easterly, 12.5 miles, \$300,000, for grading and surfacing.

RIVERSIDE COUNTY—Black Butte to Blythe, 9.3 miles, \$52,000, for grading and surfacing. The present surfacing on this road is failing due to inadequate thickness and must be strengthened.

**ROUTE 65, MOTHER LODE HIGHWAY**

EL DORADO COUNTY—Greenwood Creek and approaches, \$7,500, for construction of a bridge and grading of approaches.

CALAVERAS COUNTY—San Andreas to Angels, portions, 9.4 miles, \$120,000, for grading, surfacing and bridge construction. This allotment will complete the construction of the section of highway between San Andreas and Angels Camp.

**ROUTE 68, BAY SHORE HIGHWAY**

SAN MATEO COUNTY—In South San Francisco, \$150,000, for grade separations.

**CASITAS PASS ROAD**

VENTURA COUNTY—Casitas Pass Road, portions, \$150,000, for grading.

**ROUTE 77, INLAND ROAD**

RIVERSIDE COUNTY—South Boundary to Corona, 45 miles, \$45,000, for surfaced shoulders.

**ROUTE 78, POMONA TO TEMECULA HIGHWAY**

RIVERSIDE COUNTY—Elsinore to Box Springs Grade, 25.0 miles, \$25,000, for surfaced shoulders.

**ROUTE 80, SAN MARCOS PASS ROAD**

SANTA BARBARA COUNTY—Santa Barbara to San Marcos Pass, 5.7 miles, \$500,000, for grading and structures. The present dangerous, crooked and steep San Marcos Pass Road is to be reconstructed.

**REPORT ISSUED ON SALINITY CONTROL**

(Continued from page 27)

tively and practically solving the salinity problem. The studies show that salinity can be positively controlled by stream flow so as to prevent any harmful saline invasion into the Sacramento-San Joaquin Delta. The plan proposed for controlling salinity by stream flow will maintain a dependable and adequate fresh water supply in the delta channels for the full consumptive demands of the delta. The delta channels will then provide a dependable nearby source for diversion of fresh water supplies, now or hereafter made available therein, for the needs of industrial, municipal and agricultural developments in the upper bay region. If the proposed plan of control is adopted and put into effect, the present salinity menace to the delta will be removed and the salinity conditions in the upper bay and lower delta channels will approach the equivalent of those under natural conditions.

The report contains 440 pages and is well illustrated by 82 plates and graphs. Copies may be obtained through the Bureau of Publications and Documents, Capitol Building, Sacramento, California.

Two spinsters were discussing men—

"Which would you desire most in your husband—brains, wealth, or appearance," asked one.

"Appearance," snapped the other, "and the sooner the better."—*Georgia Highways*.

"Your teeth are in bad shape," said the dentist to a patient. "You should have a bridge put in at once."

"How much will a bridge cost?"

"About seventy-five dollars."

"Say, doc, can't I get along with a small culvert?"

—*The Highway Magazine*

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C. C. CARLETON, Chief

FRANK B. DURKEE, General Right of Way Agent

C. R. MONTGOMERY, General Right of Way Agent

**DIVISION OF PORTS**

Port of Eureka—William Clark, Sr., Surveyor

Port of San Jose—Not appointed

Port of San Diego—Edwin P. Sample

