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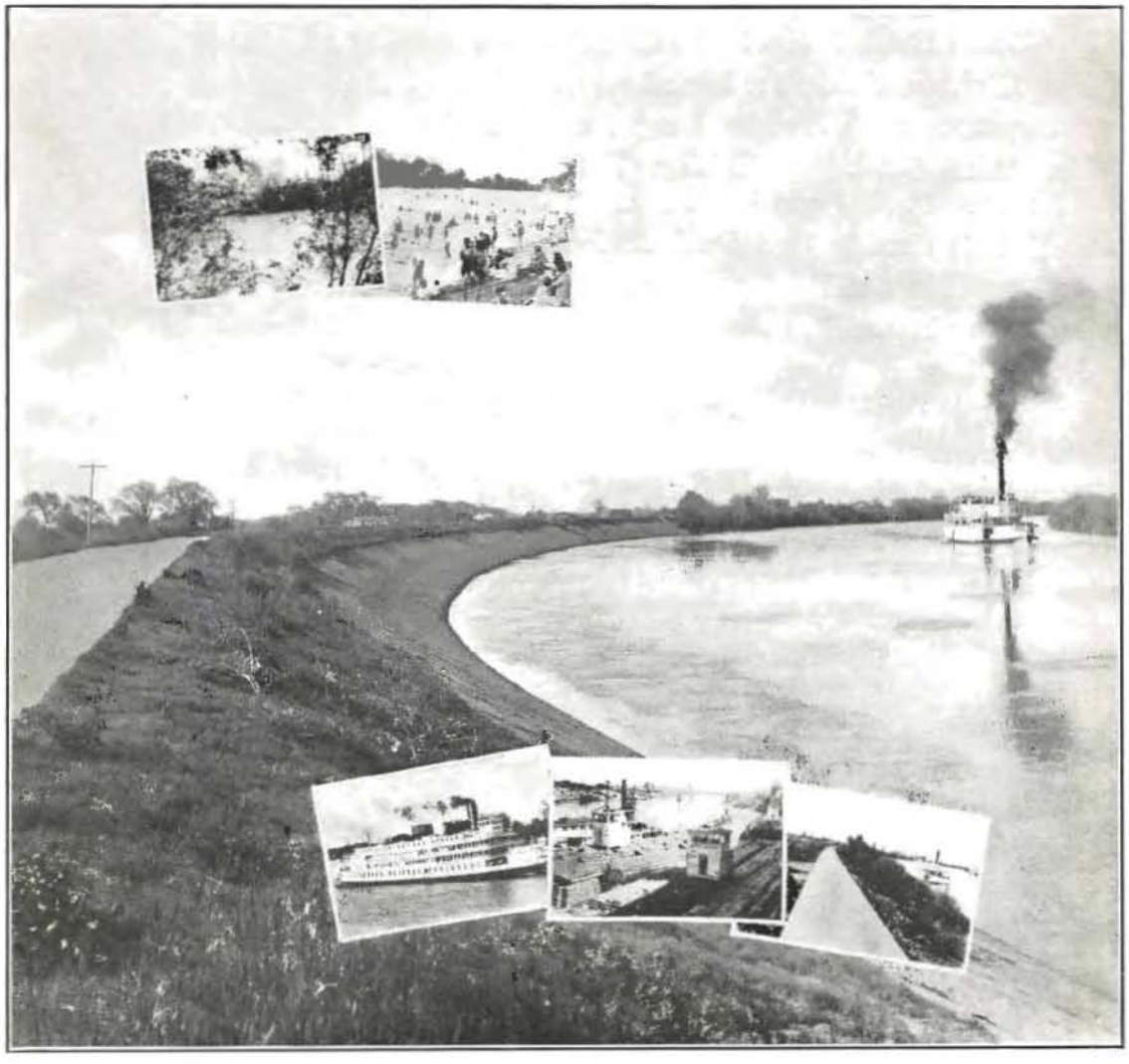

The Sacramento River at Sacramento

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Ruts Can Not Hold California

By M. B. HARRIS, Member of the California Highway Commission.

CALIFORNIA has about 6500 miles of State Highway in a more or less finished, or unfinished, condition. That is farther than from San Francisco to New York City and back again. It has about 70,000 miles of county and city highways, also in a more or less finished condition. Altogether it has over 75,000 miles of roadway, some of which is traversable with patience, and some of which is as good highway as can be found anywhere in the world. Our whole road system would reach around the earth at the equator three times, with something over. At the rate of three hundred miles a day, it would take two hundred and fifty days to go over it all. But more than half of this mileage is yet to be properly constructed, and from ten to fifteen years will be required for that purpose.

M. B. HARRIS.

REAL ROADS RATHER THAN PAPER ROADS

Sense and conscience both demand the completion of these roads before new ones are added; and especially so when one realizes that perfecting existing roads shortens distances and contributes to convenience much more effectively than do new roads on paper.

And as to adding to our revenue for road building by bond issues or other devices: Away with the thought! We have enough, but not too much, revenue now. What we have can be used to good purpose and economically. Let us have no orgy of road building.

PIONEER DEVELOPMENT

The pioneers in the development of our road system planned and built even better than they knew. One must travel by auto for weeks over this state to realize what it meant to plan a system of roads that should respond at all adequately to the longitude, latitude and altitude of this unique state, and at the same time accommodate itself to traffic conditions as they were and as they would probably develop. But they did it. And what is more, they experimented with sound judgment and clear insight in the matter of road construction, with all that means under the varying conditions of soil, climate, moisture and heat of a state that runs the gamut from tropical to boreal, and from desert to swamp.

They have contributed an admirable road plan and an experiment in road building which, augmented by that of road builders everywhere, should result in the construction of the very best roads to be found anywhere in the world. And that is exactly what is now being done. These roads have been planned so that it is easy to enter the state from both north and east, and so that whether it be commerce, scenery or climate one seeks, there is an easy way to it, or will be when these roads are completed. There is to be a uniform construction and improvement of roads throughout the state so that each part of the state shall have its just proportion.

In this article former State Senator M. B. Harris of Fresno tells of the relationship of California to world development and of the part that highways are playing and will play in making California the center of "commerce, and wealth, art, literature, culture and a civilization such as the world has never before known." Senator Harris points out that California's road system, including state and county highways, would reach around the earth at the equator three times and would take 250 days to travel its length at the rate of 300 miles a day. He urges the completion of the present roads before new highways are admitted into the state system but warns against any "orgy of road building." He also pleads for the preservation of the recreational areas of California, declaring that "our children will see a population in California so great that the thought of it appalls a lover of the great waste places and solitary mountain trails." Again Senator Harris says: "Undoubtedly there is a correspondence between visible things and human thought. Men think, act and live to some extent in harmony with the things they see."

CALIFORNIA IS UNIQUE

California is unique physically, climatically, geographically and historically. The

white man, trekking west from somewhere in Asia, has reached the end of the trail in California. Three hundred years ago (four long lives span it) he settled the Atlantic Coast of this continent. One hundred fifty years ago (two long lives span it) he introduced the United States into the family of nations. At that time the United States was a narrow strip along the Atlantic and had a population of about 3,500,000, or less than California has now. Today the continent is settled from Atlantic to Pacific. The 3,500,000 has become 110,000,000. This coast, the last to be reached, has just begun to develop. Seventy-five years ago (one long life spans it) California was admitted to statehood with a population of 93,000. Whether we like it or not, the millions are on their way, and will soon be here. Our children will see a population so great that the thought of it appalls a lover of the great waste spaces and solitary mountain trails.

California has an area equal to that of the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York and Pennslyvania, and natural resources and trading opportunities even greater. Its population is about five million. Theirs is more than thirty million.

SAVE THE RECREATIONAL AREAS

Thinking of thirty million people may suggest corner lots, but I am thinking of our beaches, the longest and most beautiful in the world; of our forests, unrivalled in the size and majesty of their trees; of our many natural parks, so much more desirable than man-made parks. Somehow, some of these at least, must be preserved in their beauty, and reserved for the use of the public. It is quite true that Jones, who owns the land, does not own the landscape, and that the beauty of it is for him who looks upon it. But Jones can devastate the beauty of the forests and fence the beach, or worse still, cover it with oil derricks.

California has all of the beauty and grandeur and variety of scenery of Greece, Italy and Switzerland. Undoubtedly, there is a correspondence between these visible things and human thought; there is a relation between mind and matter. Men think, act and live to some extent in harmony with the things they see.

Here, too, we have all the varieties of climate found in old world lands where the highest civilization has been developed. There is no climate about the Mediterranean, that birthplace of civilization, but has its counterpart here; and so has almost every other climate, for that matter, that can be found anywhere in the world. And there is a close relation between climate and civilization.

NO RUTS IN CALIFORNIA

There are no ruts in California, either in the roads or in our customs. We are new, very new. The habits and prejudices of the past (for there is no past here) do not forbid the installing of bathtubs in our houses, nor sewer systems in our cities.

Here we are developing an educational system, from kindergarten to university, which should be distinctive and individual, and will become so when we renounce the idea that scholastic institutions are measured by their registration.

THE OPPORTUNITY THAT IS OURS

What an opportunity! Here at the end of the white man's trail, in a new land, with all history to guide us, with no ruts to hold us, with all the favorable conditions of climate and land that produced the greatest civilizations of history, with transportation possibilities that annihilate distance, and give the experiences and contacts that prevent provincialism, here we should develop not only commerce and wealth, but an art, a literature, a culture and a civilization such as the world has never before known.

Wednesday has been selected by the State Department of Public Works as a uniform week day for the opening of bids on construction work. The selection was made by B. B. Meek, Director of the Department, at the request of the contractors of the state. It was stated by the latter that Monday, the day upon which bids have previously been opened, worked a hardship upon contractors in that it conflicted with county and city bid openings. It was also urged by contractors that it was sometimes difficult for them to make the required banking arrangements at the end of the week in readiness for Monday and on that account added several days bank interest.

The difficulty of securing material quotations at the end of the week was also given as a reason for making the change.

The construction of an elaborate system of superhighways, greatly enlarging the federal-aid highway program, which provides for 182,000 miles of federal-aid road, has been asked in a bill just introduced in congress by Senator George H. Moses of New Hampshire. The measure, actively supported by the American Motorists Association, provides for a highway as direct as practicable between the Atlantic and Pacific coasts and for cross highways, which would connect the entire United States.

The Six Legged Tetrahedron

Not a Prehistoric Animal, But an Effective Protector of Highways

This article, with photographs, covers a recently completed river bank protection job by the state in Ventura County. The type of protection work is very unique and has proved very successful.

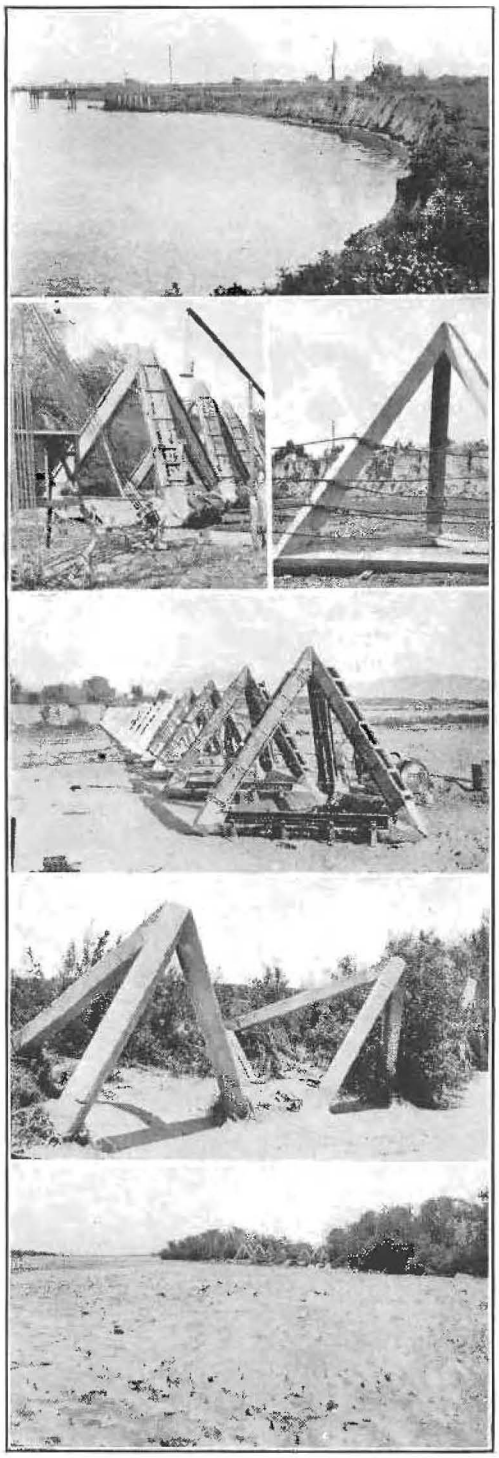
By E. T. SCOTT, Assistant District Maintenance Engineer.

If the Santa Clara River were allowed to choose its own course, it would flow some place other than under the present 2077-foot state highway bridge near Montalvo, on the Los Angeles-Ventura Highway. On several occasions during the last few years the river, swollen by flood waters, has swung sharply to the west, cutting away the 15-foot embankment on that side of the river, and destroying several acres of agricultural land.

During the storm of February, 1927, the river took another swing to the west at a point about 1200 feet upstream from the state highway bridge and continued to wash away the high river bank until it threatened to cut through the west approach to the bridge. Only the vigorous action on the part of the maintenance organization, the crew working night and day, prevented the highway from being washed out.

TETRAHEDRON ANSWER TO PROBLEM

The trees, cable and brush used successfully by the maintenance crew during the storm, in preventing the flood waters from cutting through the highway, offered but a scant barrier to further inroads from the stream during floods of the winters to follow. Studies were made to determine the best means of bank protection for the particular case. An inspection made of various types of bank protection work used in the Santa Clara River showed that the only type of permanent bank protection that had successfully withstood the floods was the concrete skeleton tetrahedron.



The accompanying pictures show an effective method of highway protection against flood that has been adopted on the Santa Clara River in Ventura County. The upper picture shows the damage done by high water eating into the bank, beneath it is a picture showing how a tetrahedron is anchored. Next below it, is a picture of a view of a line of tetrahedrons in place. The next picture shows the tetrahedron tilted by flood water but still in place. The lower picture shows brush and trees growing up behind the tetrahedron and reestablishing the natural bank.

SUCCESS PROVED

The use of concrete skeleton tetrahedrons to control the river was first employed by Dan Sheldon who has owned and operated for many years a 400-acre ranch immediately north of the state highway and located along the west bank of the river. Beginning back in 1912 Mr. Sheldon invented and constructed and placed at strategic points along the river, concrete tetrahedrons which have been most successful in controlling the flood waters of the Santa Clara River.

Standing thirteen feet high, composed of six 16-foot legs a foot square, well reinforced with steel, and weighing about seven tons each, the concrete tetrahedrons are capable of withstanding a tremendous force.

Should the tetrahedron be undermined or even toppled over by the flood, it still stands on a broad base always offering resistance to the on-rushing water. Several years ago one of the 7-ton tetrahedrons standing at the end of a row, and not cabled to the adjoining tetrahedrons, was washed a quarter of a mile down stream by the flood. It took hours for the heavy concrete figure to cover the quarter mile and each time it rolled to a new one of its four similar bases, it stood upright, always resisting the force of the river. After the storm the strayed tetrahedron was dragged back to its place with a tractor, having suffered no damage during the trip.

MAKES ITS OWN BARRIER

A large amount of driftwood and brush is carried by the Santa Clara River during flood times. Soon the drift begins to accumulate against the row of concrete tetrahedrons laced together with cables. As the tangle of brush increases, the swift current of the river is halted a little and the silt and sand carried by the water begins to drop and accumulate both upstream and downstream from the obstruction, and the river veers back to its old channel. In a very short time the row of tetrahedrons stops the flood with a wall of brush and sand that the river itself has built.

DETAILS OF JOB

In order to adequately protect the highway embankment and force the river over toward its old channel, a row of thirty concrete skeleton tetrahedrons placed approximately nineteen feet apart from the center of one to the center of the adjoining one, was constructed along the west bank of the river on the upstream side of the bridge.

The row of tetrahedrons, nearly six hundred feet in length, was constructed from the river bank at an angle swinging downstream, and completely crossing the newly cut low water channel of the river.

During the construction of the straight row of the thirty tetrahedrons, ranchers owning property along the east bank of the river, over 2000 feet away, objected to the continuation of the work as originally planned fearing that flood waters would be forced across the river to do damage to their property. In order to appease the fears of the complaining ranchers and at the same time without lessening the effectiveness of the protection work, an angle was thrown into the line and the six tetrahedrons furthest from the bank were constructed at a right angle to the direction of the bridge.

METHOD OF MAKING

The concrete skeleton tetrahedrons were made up of six legs, each 12 inches square and reinforced with eight ½-inch bars, the two outside corner bars of each leg being 17 feet 6 inches long, bent into and tied to the opposite corner bar of the adjacent legs, and six bars 14 feet long extending into adjacent legs, at the junction. A spiral reinforcement of a number 8 wire was wound with a 6-inch pitch, around the longitudinal reinforcing bars.

Each leg, measured from corner to corner, was 16 feet long, the height of the tetrahedron from the ground to the vertex being approximately 13 feet.

Steel reinforcement was assembled where the tetrahedron was to be constructed. Sheet iron corner forms were then slipped over the reinforcing bars at the three corners of the base and wooden forms for the legs set in place. A sheet iron corner form similar to those used on the base corners, but having a small opening at the top to admit concrete, was used at the vertex of the tetrahedron.

Concrete was poured into the lower part of the tetrahedron direct from wheelbarrows, and when it got too high for the wheelbarrows, it was shoveled into the forms, while the last few cubic feet of concrete to be placed at the top was elevated by a bucket attached to a portable swinging teeter beam.

HOW THEY WERE PLACED

The row of tetrahedrons was placed with the 16 feet sides lining up on the upstream side, with the points of the equilateral bases downstream. A space of three feet was left between the corners of adjoining tetrahedrons on the upstream side.

Six lines of old one-inch cable, secured from nearby oil fields, were stretched along the upstream side of the tetrahedrons, with one line along the downstream side of the row. The cables were fastened in place by wrapping around the legs and by the use of cable clamps, the purpose of the cable being to tie the whole row of tetrahedrons together so that they would act as a unit during a flood, and also to catch and hold the brush and trees carried down by the storm waters.

ANCHORED TO RIVER BANK

At the bank end of the protection work, the cables were cast into a large block of concrete which anchored them at a safe point to the river bank. Some brush was piled in near the bank to prevent any possible cutting in back of the protection work.

COST OF WORK

The reinforced concrete tetrahedrons were constructed at a cost of about $112 each, exclusive of the

(Continued on page 15.)

The Passing of "Passing-the-Buck"

By GEORGE C. MANSFIELD.

PASSING-THE-BUCK is fast becoming a thing of the past in the conduct of California's government.

Authority—Alexander R. Heron, Director of the Department of Finance of the State of California, an expert on both state finances and state government.

Reason—The Governor's Council.

Time was when passing-the-buck and politics were considered as synonymous terms. It was the most ancient of political practices, the most venerable of political rites. It was justified on the basis of political self-preservation. The slogan was:

Safety First. Do nothing, but don't get caught at it! Pass the buck!

But when the Governor's Council came in at the door, buck passing opened a window for its exit. The fact is already recognized in Sacramento. The state is now beginning to find it out.

MR. HERON TELLS STORY

This is the way Mr. Heron told the story in a recent address to which the writer had the pleasure of listening, and which he believes may be of interest to the readers of the journal.

"The directors of the nine major state departments into which Governor Young and the legislature consolidated the one hundred and more previously existing state agencies meet together each month with Governor Young. This is known as the Governor's Council.

"They all meet in the same room at the same time.

"All of the directors are appointed by the Governor, and are responsible to him for the conduct of the departments they respectively represent.

"Many, and in fact most, of the major activities of the state require action from more than one department. Before the reorganization and coordination of the state department, when over one hundred agencies of the state functioned independently of each other, joint action was difficult of attainment. The situation encouraged buck passing. It was easier to alibi than to act.

"The Governor's Council, however, has created a condition that reverses this. The reason is plain. It is extremely difficult to pass the buck when the person to whom you are passing it is in the same room with you and ready to pass it back.

"EASIER TO ACT THAN TO ALIBI"

"In other words it is easier now to act than it is to alibi."

Mr. Heron illustrated his point by describing a hypothetical meeting at the Governor's

ALEXANDER R. HERON.

Council, in which the following imaginary incident might have occurred:

The Director of Institutions reports that patients in a certain state hospital are sleeping on the floors and in the halls by reason of inadequate housing facilities.

The Director of Social Welfare corroborates this report, and states that this overcrowding has been noted at her last inspection of the hospital in question.

The Governor turns to the Director of Public Works, and calls attention to the fact that an appropriation was included in the budget for enlarging the accommodations at this

particular institution. It is up to the Director of Public Works to make some explanation.

The Director of Public Works states that the Director of Finance has not yet made the appropriation available for us. The Director of Finance must in his turn explain the failure of his department to function.

With all of responsible parties together in one room with the person to whom they are all responsible, situations between departments that it previously took months to unsnarl are untangled in a few moments.

PUTTING BUSINESS METHODS INTO GOVERNMENT

"The Governor's Council," continued Mr. Heron, "is bringing to the business of the state the same precision of procedure that a business corporation demands of its executives.

"The plan is proving as successful in practice as it was excellent in theory. In the five months that have passed since the organization of the Council, it has been very clearly shown that the percentage of uncompleted passes in state government has been very considerably reduced. This is the logical result of a system that makes it possible to readily determine where fault lies and to immediately fix responsibility."

HOW JUMBLE GREW

Of equal interest with Mr. Heron's statement of the value of the Governor's Council to the state was his explanation of how California's government grew into the jumbled mass of over-lapping and conflicting jurisdictional agents that existed before the coordination of departments took place.

Mr. Heron, in addition to the aid given Governor Young in Mellon-izing the financial affairs of the state through the institution of a complete state budget, also gave yeoman service in the difficult and involved task of helping the Governor to redepartmentalize the state government on a workable, efficient, and economical basis. He accordingly again speaks with the voice of authority.

"California's government, like all other state governments," Mr. Heron says, "was like Topsy. It just grew." He continued:

"The first function of government everywhere has been to protect life and property.

"This next expanded into the protection of certain civil and individual rights.

"These in turn gave birth to a new conception of the function of government, namely that the government should give to its citizens the opportunity for the highest development of their individual abilities.

"This latter conception of government is reflected in the free public schools and in a score or more of enlarged governmental activities.

"During the last twenty years, the same thought has found expression in laws for the regulation of housing conditions, hours of labor, rate and method of pay, child labor, sanitation, employment of immigrants, and a hundred other similar functions.

THE PRICE OF PROGRESS

"Each new service seemed to require the creation of a new governmental agency. The political thought of California has very possibly been more progressive and enlightened than elsewhere in the world. Accordingly these functions may have been added to state activities here more rapidly than elsewhere. At first there was little confusion between existing governmental agencies. But gradually the "set-up" in state affairs became more and more complicated and tangled.

"Finally, when Governor Young undertook to cut the Gordian knot, there were more than one hundred and forty state boards, commissions, and bureaus and other agecies in California, each created independent of the other, all jealous of their jurisdictional rights, all attempting to operate independently, and all more or less resentful of interference from other agencies, even where functions were allied and rights related.

"This confusion of governmental agencies was a penalty that California paid for the progressiveness of its political thought, and for rapidity in the development of a humanitarian program unequalled elsewhere in the world.

SAVING GOLD, ELIMINATING DROSS

"Governor Young's job was to save the gold of this program, and eliminate the dross. His long experience in Sacramento as assemblyman and lieutenant governor gave him an insight into conditions in the state government that a less experienced governor could only acquire after years in office. He immediately undertook two tasks, both of large proportions.

"The first of these was to give to the people of the State a complete accounting of state expenditures in advance of their actual disbursement. A real state budget, the first of its kind in the history of California, one without a deleted figure or a single activity of the state omitted, was the result. The second major undertaking was the reorganization of the state upon a business basis."

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Sacramento-San Joaquin Water Problems

By HARLOWE M. STAFFORD, Sacramento-San Joaquin Water Supervisor, Division of Water Rights.

APPROPRIATIVE and other vested water rights on the Sacramento River between the city of Sacramento and Red Bluff total approximately 6000 second-feet. Water requirements both for irrigation and salinity control in the great and fertile delta of the Sacramento and San Joaquin rivers approximate 3500 second-feet or more with a much greater flow required to maintain the desired fresh water along the industrial section downstream from Antioch and Pittsburg. An estimated flow of from 3000 to 3500 second-feet in the Sacramento River above Sacramento is needed to satisfy navigation requirements. Yet there was an actual available flow in the river at Red Bluff after July first of not more than 3500 second-feet in four of the last eight seasons and one only had more than 4500 second-feet. Similarly, there has been a summer flow of the San Joaquin River to the delta of considerably less than 1000 second feet in some of these years.

HARLOWE M. STAFFORD.

SITUATION ACUTE IN 1920

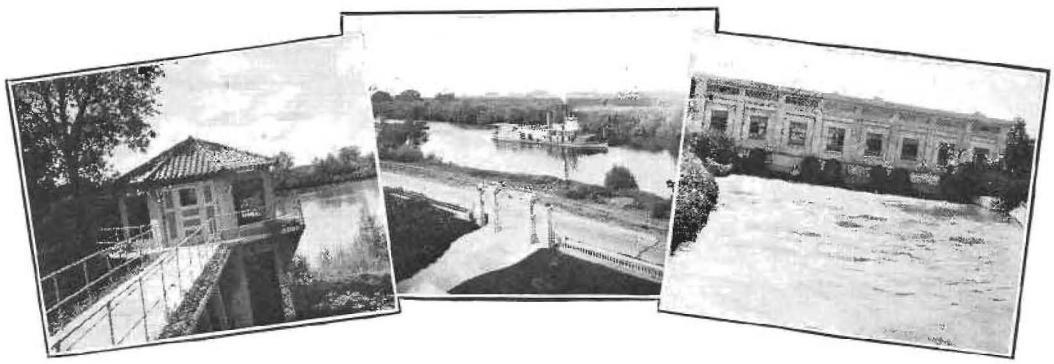
These problems are serious and are demanding the earnest thought and endeavor of the various interests involved and of the state, for an early solution. The first acute situation to arise was that in 1920. In that year, with the run-off of the San Francisco Bay drainage area only 48 per cent of normal and the largest rice planting in the Sacramento Valley in the history of the industry up to that time, the situation was saved through the Emergency Water Conservation Conference, a voluntary organization of water users and state officials, and a Water Master appointed by the conference to regulate the Sacramento River diversions of those signing a Water Users' Agreement prepared by the conference. It was in this year, however, that, as a result of the salinity encroachment in the delta, the famous Antioch suit was instituted. This cost the valley some hundreds of thousands of dollars but did not result in a solution or even a basis for a solution of the problem.

1924 EMERGENCY

Following years of more normal stream flow in 1921, 1922 and 1923 came the extremely dry year of 1924, when the run-off of the San Francisco Bay drainage area was only 27 per cent of normal. With the probability for a critical season evident as early as January in that year, a pressure for the initiation of a definite constructive program in the solution of the problems was felt on all sides. This found expression in the first Sacramento-San Joaquin River Problems Conference, which was held in Sacramento January 25 and 26, 1924, under the auspices of the Division of Water Rights and the Sacramento Chamber of Commerce.

Through the medium of authoritative papers presented by experts this conference brought out clearly for discussion the many angles to the problems from the standpoint of the up-river water users, the delta irrigators and the navigation, power and industrial interests. A committee known as the Permanent Committee of the Sacramento-San Joaquin River Problems Conference was appointed to "* * * prepare a program for the coordination, adjustment, and development of all irrigation, power and navigation interests, with a view to securing the utmost conservation and use of the waters of the Sacramento and San Joaquin rivers and their tributaries for the protection and benefit of all."

There is probably no other place in the United States where a problem of the complexity and diversity of the one discussed in this article can be found uniting irrigation, flood control, navigation and the control of salinity. In most cases in arid America the only problem encountered is that of getting an adequate supply of water to the land but here we have the several other phases. It is difficult in many cases to solve the problems because of inadequacy of the supply but it is gratifying to know that it is physically possible to care for and develop all interests in the Sacramento Valley to the utmost. The engineers and the committeemen who will have charge of the supervision of this development must indeed be men of super vision.



Views along the Sacramento River—To the left, the picturesque irrigation plant of Natomas-Elk Horn Mutual Water Company on the Sacramento River, a few miles up stream from Sacramento; average capacity about 65 cubic feet per second: Middle picture, scene in the delta of the Sacramento: To the right, is a view of the Tisdale Pumping Plant of the Sutter Basin Company near Grimes. This is one of the largest irrigation plants on the Sacramento River. Its average capacity is 600 cubic feet of water per second.

Since the first conference this committee has functioned actively and has proved to be a powerful influence in welding together the divergent interests involved, in bringing about constructive cooperative effort and in preventing litigation in the face of critical situations that have arisen.

Early in 1924 the Permanent Committee, in cooperation with the Division of Water Rights, instituted a definite plan of action to carry through the irrigation season. This called for an agreement among the water users and other interests to provide for a water supervisor to be appointed by and work under the direction of the division.

In specifying the functions of such an official there were certain considerations which should be clear. Basically, it may be stated that the ultimate objective of all water legislation and administrative effort is the distribution of the water itself to those having a valid claim upon it, and where the water titles on a stream have been definitely adjudicated, experience has demonstrated that this can be readily accomplished through a State Water Master. However, as indicated in a previous article,* in striving to consummate the prerequisite clearing of water titles, three courses are open: (1) litigation, (2) the code provisions of the Water Commission Act, and (3) mutual agreement based upon investigations and determination of physical fact.

In the case of the Sacramento-San Joaquin situation, with litigation and its destructive ramifications naturally repellent, and the second course inapplicable because of the many classes of water rights under which diversions are made, the third course becomes the one most practical and applicable. This is indicated in an analysis of the water diversions under the various classes of water rights, showing in 1926 for example:

For the Sacramento River and tributaries in the valley above Sacramento:

Old appropriative rights (initiated Prior to the Water Commission Act)	847,083 acre-feet
Appropriative rights under permit from the Division of Water Rights	721,442 acre-feet
Presumably riparian rights	76,447 acre-feet

For the Delta Uplands (from Lower San Joaquin River and Old River above the Delta):

Old appropriative rights	52,418 acre-feet
Appropriative rights under permit	84,619 acre-feet
Presumably riparian rights	9,869 acre-feet

For 265,000 acres irrigated in the Delta in 1926, a considerable portion is covered by appropriative filings before the Division and practically the entire delta area of more than 400,000 acres claims water under riparian rights.

With the facts of water supply, actual water requirements and use definitely established through engineering investigation, experience has proven it perfectly feasible to base thereon mutual agreements, either temporary to tide over an immediate crisis or more or less permanent, under which a water master or water supervisor may successfully distribute and conserve for the best interests of all a deficient water supply. The water supervisor's authority and benefits to be derived from its exercise will extend only so far as the water users' mutual agreements permit.

(Continued on page 30.)

*See November, 1927, issue of CALIFORNIA HIGHWAYS AND PUBLIC WORKS—article entitled "Putting the 'Right' into Water Rights," by Harold Conkling, Chief, Division of Water Rights.

Necessity for Adjudication of Existing Water Rights in California

By GORDON ZANDER, Hydraulic Engineer, Division of Water Rights, Department of Public Works.

THE IMPORTANT part which the water resources of California have played in development of this state to its present population of about five million people, and its present wealth as represented by a total assessed property valuation of about seven and one-half billion dollars, can hardly be overestimated.

GORDON ZANDER.

In pioneer days, when the mining industry was the chief factor which stimulated our remarkably rapid early growth, mining operations of every character were dependent upon a supply of water. The waters of our streams were used extensively for hydraulicking, sluicing, panning, stamping, etc. Later, as the more lucrative mining areas were worked out, the attention of our population was gradually diverted to the agricultural development of our great fertile valleys. The extent to which this agricultural development has now progressed is indicated by an estimate compiled by the United States Department of Agriculture, showing that the total value of all California farm products marketed in 1926 was 656 million dollars. For comparison, various sources of information indicate total values for our 1926 production in other classes of raw materials as follows: minerals (including oil), 450 million dollars; lumber, 73 million dollars; fishery products, 18 million dollars.

DRAFT ON WATER GROWS

It was eary recognized that in general most crops can not be successfully and profitably grown in California without irrigation, on account of our long summer dry season: consequently our remarkable agricultural development has been accompanied by a constantly increasing draft upon the waters of our streams for irrigation purposes. By the use of an extended curve plotted from the total irrigated areas in the state as shown by the various government censuses up to 1920, it is roughly estimated that there are at present approximately six million acres of land in the state that are under irrigation.

In more recent years hydroelectric power development, in which California has lead the entire world, has become a very important factor in the utilization of our water resources. According to information recently issued by the State Railroad Commission, hydroelectric plants having an aggregate capacity of nearly two million horsepower have already been installed in California.

Automatic recording device on Soldier Creek, Modoc County. By means of this device a continuous record of the flow of the stream was kept during an adjudication investigation.

And in addition to the utilization of our water resources for mining, agricultural and power purposes, there is the ever increasing demand for water for domestic use by our growing population, and for municipal and industrial uses within our rapidly expanding cities and towns. Only those in close touch with our water resources realize what a factor water is in the remarkable development that has taken place in California since it was admitted to the Union only seventy-eight years ago.

REMAINING UNAPPROPRIATED WATER RESOURCES LIMITED

Have we still unlimited unappropriated water resources for our population to draw upon for further development, in the comparatively unrestricted manner in which they

have been free to draw upon them in the past? The answer is clearly in the negative. This conclusion was first officially recognized by our legislature in 1913, when a complete code of water laws, known as the "Water Commission Act," was enacted. And it was again recognized by the legislature in 1921, when funds were appropriated for a comprehensive engineering study of our water resources to be made under the supervision of the State Engineer, for the purpose of formulating plans and policies under which a systematic, judicious and coordinated development of our remaining unappropriated water resources could proceed.

On many streams in the state development has already progressed to a stage where the aggregate of the quantities of water claimed

STREAM GAGING STATION ON HAT CREEK, SHASTA COUNTY.

Records of the stream flow at this station have been kept for the past five years as a basis for an adjudication of the water rights and for subsequent administration of the stream.

by the various water users exceeds the normal water supply. On most other streams developments have already been proposed that would utilize the balance of the water supplies, as evidenced by filings with the State Division of Water Rights. Under these conditions it is clear that the public welfare demands that as further development takes place, present water users must be protected in their rights already vested, and at the same time capital invested in new projects must be assured of the water supply filed upon for such projects in so far as unappropriated waters will permit, and protected against the possibility of expensive litigation caused by exorbitant claims on the part of owners of prior rights.

PROTECTION OF WATER USERS AN IMPORTANT DUTY OF THE STATE

The protection of a party in the enjoyment of a water right which he has legally acquired is just as much a function of government as is the protection of that party in the enjoyment of any property rights that he may possess. Furthermore, as it is a generally recognized principle that the state owns its water resources and merely allows the acquisition of rights to use the same under certain restrictions of law, it would appear that the state government is the proper agency to provide the necessary protection to water users. This duty on the part of the state has been recognized by the legislature by the inclusion in the Water Commission Act of complete provisions for the necessary machinery for state administration of our stream systems through the agency of "water masters."

ADJUDICATION NECESSARY BEFORE PROTECTION CAN BE AFFORDED

Before a stream system can be administered by the state, however, all water rights on the stream must be adjudicated in order that a definite basis for distribution may be established. In this connection it is pointed out that no definite control over the acquisition of rights by appropriation was exercised by the state prior to 1914, when the Water Commission Act went into effect; consequently most appropriative water rights initiated prior to that time are undetermined as to amount of water, and many are undetermined as to priority as well. In addition, there are the many undetermined riparian and prescriptive rights, of which in most cases there is not even any record.

COURT ADJUDICATIONS GENERALLY EXPENSIVE AND OFTEN INADEQUATE

Prior to the enactment of the Water Commission Act, an adjudication of water rights could only be accomplished through regular court procedure. Court proceedings have generally proved very expensive, however, and in many cases they have failed to bring about the desired results. Stream flow is one of the most difficult subjects of litigation because by its very nature it is extremely variant in quantity and difficult of measurement. A recent example of the extent to which water litigation can become involved occurred in the suit brought by the Santa Margarita Rancho involving water rights on the Santa Margarita River in San Diego County. Up to the present time that case has occupied 186 full court days, during which 22,000 pages of transcript have been taken, and the hearing has not yet been completed.

WATER COMMISSION ACT PROVIDES ADEQUATE ADJUDICATION PROCEDURE

With the passage of the Water Commission Act provisions were made available under which a complete adjudication of all water rights upon any stream system may be accomplished in a single proceeding, through the

(Continued on page 27.)

Caring for the Dangerous Insane

California Provides Home at Mendocino Hospital Designed for Deranged Patients of Anti-Social Delusions

By W. K. DANIELS, Deputy Chief, Division of Architecture.

AMONG the many different types of housing problems the Division of Architecture must meet and solve in connection with state institutions, one in particular stands out and requires studies involving new problems in state architectural studies.

The problem of housing and caring for the insane presents many obstacles, but the matter of housing and caring for insane of anti-social tendencies is indeed a major problem. The solution of this problem, however, is apparently near as the Division of Architecture is at the present time constructing a building at the Mendocino State Hospital which will function as a hospital for insane patients requiring special custodial care.

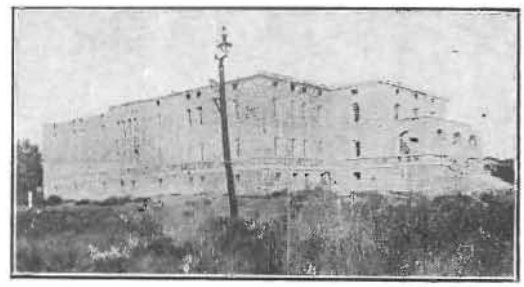
W. K. DANIELS.

As early as 1882 the suggestion was first made to erect a building to house what was then termed "criminal insane." The idea originated in the prisons whereby prisoners becoming insane could be properly segregated from other prisoners and be accorded medical attention of a nature the prison physicians were unable to give. After repeated requests from the Prison Board, the legislature appropriated a sum to erect such a structure and about 1905 a project was started at the Folsom State Prison. Besides costing a considerable sum of money, several years were consumed in its erection. The building as designed was of the jail type and built of granite stone quarried and prepared by the prisoners. Construction work was done by prison labor under the direction and supervision of the then State Engineer.

Construction was carried along to a point nearing completion, but when the biulding was about to be turned over to the prison authorities for operation, opposition arose to this method of caring for insane persons of the type described. Objection was based on the theory that it was wrong to consider the insane of any nature as criminals. It was asserted that their care should not be connected in any way with a penitentiary. The objections prevailed, and as a result, the structure was never used for the purpose originally planned. For a time some of the cells were used for solitary confinement cases. An attempted escape resulted in a killing, and since then the building has been abandoned.

The Division of Architecture has in the past made various surveys and estimates as to ways and means to utilize the material in the structure but nothing has developed from these studies. The building stands today, outside the prison walls battling the elements, defeated in its purpose of assisting society in the burden of caring for insane persons requiring special custodial attention.

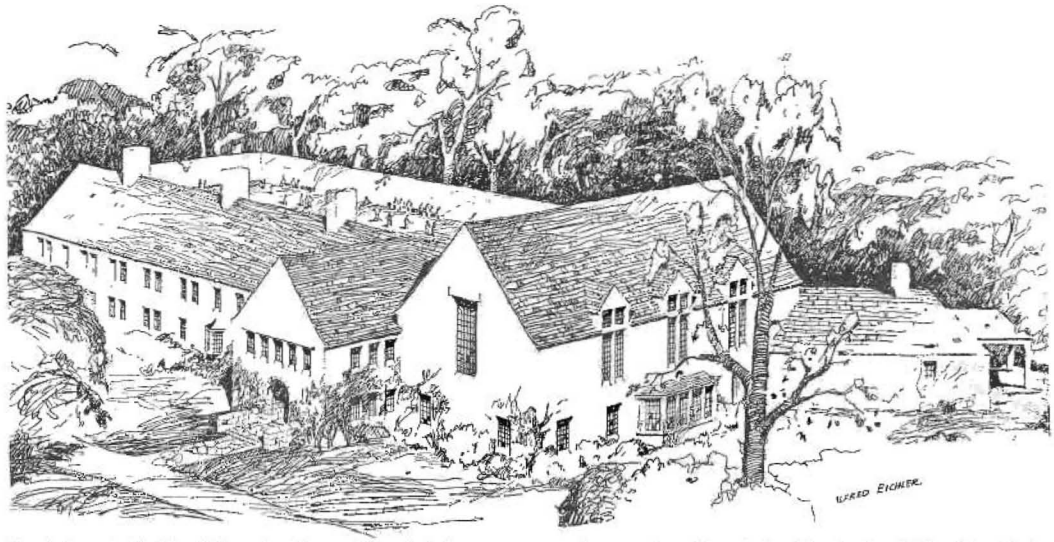
As a result of this failure the state institutions for insane were obliged to continue to care for this type of patient. They did this in the most satisfactory way possible under existing conditions. The hospitals for the insane were not controlled by armed guards as



Jail type building for the dangerous insane constructed at Folsom and later abandoned.

are the prisons, and it is not to be wondered that escapes took place.

It so happened a patient of this type escaped from one of the state hospitals on several different occasions and set fire to buildings in a nearby town. This situation brought about a protest from the community and a movement was started to remove the hazard. As a result an appropriation of $150,000 was



Special custodial building for the anti-social insane now under construction at the Mendocino State Hospital.

approved by the 1925 legislature to erect a Special Custodial Unit to care for this type of insane.

The problem of the location of this unit was submitted to each of the state hospitals for insane for recommendations as to the site, involving as it did the housing and responsibility of the most dangerous type of person the state has to care for. To Doctor Donald R. Smith, Medical Superintendent of the Mendocino State Hospital, goes the honor of being the medical superintendent in the state service to accept this burden by voluntary offer.

Practically all of the old main buildings at the state hospitals were designed and erected on the order of jails. They had iron bars at all openings and were from three to five stories in height. In late years, however, this plan was discontinued, now buildings of domestic type, and as a rule only two stories in height, are being erected, the purpose being the reduction of the fire hazard to a minimum and the creation of a pleasing environment for the insane. By making these surroundings resemble country estates instead of jails a long step towards helping in cures was made.

The problem confronted us as to how to construct a building to meet the requirements of housing safely these insane patients of anti-social tendencies and at the same time to continue to design a building of pleasing domestic suggestions and without the appearance of a jail. With the construction of the special custodial unit at the Mendocino State Hospital, now about 50 per cent complete, evidence is given of what California is trying to do in this matter. Without doubt the building will be second to none among structures in the United States serving the same purpose. It will be the first building of its kind and character to be erected and completed in the State of California.

The nature of the insane patients to be cared for in this building is such as to require their continued confinement there. It is accordingly necessary to care for and treat them within the buildings without transferring to other buildings for treatment or other purposes. Accordingly the building is practically a complete unit in itself.

Careful consideration in planning the arrangement inside the building was given as in all other insane hospital buildings, to reduce to a minimum the possibility of patients doing bodily harm to themselves or others. In this connection, however, the writer has been informed by Doctor Smith that this particular type of insane person is not altogether dangerous while confined. In a large percentage of cases no greater care is required than in average insane cases. Should an escape be made, however, this type of the insane becomes very dangerous. Accordingly only patients of this class are to be kept in this building. This does not mean that all these patients have at some time committed crime, or have been convicted of some crime, or have spent any portion of their time in a state penitentiary. It is true that some patients who have had anti-social records will be housed in this building, but there will be others who have not.

When such patients are received at the hospital from any source, they will be examined mentally, physically and neurologically. They will receive a course of hydrotherapeutic baths, be given some form of occupation, if possible. They will be permitted many amusements, such as books, music, games of various kinds, as well as card games, checkers, moving pictures once a week, and out-door exercise whenever the weather permits for a period of from four to six hours per day. They will be fed in the large dining room and will have the use, while in-doors, of the spacious day room.

Should any patient be found to be suffering from any definite or specific condition, this will be treated as required. These patients, of course, will have access to and care from the surgery or X-ray department should either of these measures be necessary. In other words, they will receive the same care and treatment, and be given the same opportunities for recreation and occupation, as other mentally sick persons in the hospital but, owing to their anti-social proclivities, must be kept within a building from which they can not escape.

(Continued on page 29.)

CALIFORNIA HIGHWAYS AND PUBLIC WORKS.

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

BERT B. MEEK.....Director
GEORGE C. MANSFIELD.....Editor

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TOLL ROADS AND BOND ISSUES ARE DISCUSSED

Two pronouncements of policy made by B. B. Meek, State Director of Public Works, at the January meeting of the Governor's Council have been widely and favorably commented upon by the press of the state.

The first has to do with the construction of toll roads and toll bridges. Mr. Meek's statement at the Governor's Council was made in connection with a proposal to make a contribution from the Joint Highway District Fund to a road which would connect a county road at one end with a toll road on the other. Meek declared that it was his opinion that the time had passed for toll roads or bridges in California, and that the state should not participate in any road project, travel over which was not free to the public. In this view Governor Young concurred.

Mr. Meek also expressed the view that bond issues for the construction of highway projects intended to be built by the Division of Highways or for ultimate inclusion in the state road system should be discouraged. Present revenues derived from taxes on gasoline he declared both to be adequate to carry on a sufficiently comprehensive state highway program, and to represent about as large a sum as the Division of Highways could spend with proper regard to efficiency and economy in construction.

Discussing the matter of the proposed bond issue of $10,000,000 for the elimination of grade crossings, Director Meek stated that a study of all the grade crossings the construction of which is contemplated during the present biennium is now being made with a view of reaching a financial arrangement with the railroads, by which a definite policy of allocating costs between the state and the railroads concerned would be agreed upon. Mr. Meek also stated that a study was being made to determine the extent to which grade crossings could be eliminated by realignment of the highway to avoid track crossings.

Are People Ready To Have Roads Routed Rightly? Rowell Says "No"; Examiner "Yes"

Chester Rowell has the following to say in his syndicated column:

"Will the people be willing to substitute traffic pressure for political pressure as a basis for framing road programs?" asks Governor Young. And the answer is that they certainly should, but they probably will not. The highway commission of course should, and doubtless will, base its program on traffic pressure. But it need have no illusions that it will not have to resist political pressure. The purpose of roads, from the standpoint of the commission, is to carry the people where they want to go; but the purpose, from the standpoint of the local boosters' club, is to carry them where it wants them diverted, to advertise the home town and patronize its merchants. No secretary of the local boosters could hold his job on any other terms. And no highway commissioner, of course, is worthy of his place who will not resist that pressure. * * * The budget, the Governor correctly says, is an "informed, fair, and unbiased attempt to develop the state's highway system." That is exactly what we want—except for the road in our own neighborhood. For that, a "fair and unbiased" decision is the last thing local pride will permit.

San Francisco Examiner Differs.

The San Francisco *Examiner* takes a different view. Editorially that paper says:

"Will the people be willing to substitute traffic pressure for political pressure as a basis for framing road programs?"

Governor C. C. Young asks that question in submitting to the state the budget for $47,169,512 for all highway projects, just announced by the California Highway Commission. Of this $15,000,000 is for new construction.

There is no question but that the answer will be "Yes."

For two years California "detoured" in its road-building program. Road construction stopped, and the state contented itself with merely patching existing highways.

With the induction of Governor Young in office a new program of road construction was adopted. The Governor strengthened the Highway Commission, and he set the new commission at work on devising a 10-year program that will give California the best system of roads in America. The Commission has not sprung a half-ripe policy on the public. Carefully it let the plans mature. A systematic study was made of road and traffic conditions, with a view not merely of constructing highways to meet present conditions, but to build for the future.

Governor Young has the wise policy of dealing candidly with the people of the state. Just as he issued the first complete budget for state expenditures, he now issues the first complete budget for road construction. He will find that the public will answer "Yes" to his question:

"Will the people be willing to substitute traffic pressure for political pressure as a basis for framing road programs?"

New Highway Chiefs Are Named

C. H. Purcell Appointed State Highway Engineer; C. C. Carleton Heads New Division of Contracts and Rights of Way

ANNOUNCEMENT of the appointment of C. H. Purcell, District Engineer of the U. S. Bureau of Public Roads, as State Highway Engineer, was made January 28th by B. B. Meek, Director of the Department of Public Works.

The announcement by Mr. Meek was made upon his completion of six months in the office of Public Works. During this six months Mr. Meek has devoted his time and attention to the intensive study of the organization and duties of the department.

The announcement also included a statement that the resignation of R. M. Morton, as State Highway Engineer, had been accepted. That in accordance with legislative authorization, a Division of Contracts and Rights of Way for the Department of Public Works had been created with C. C. Carleton of Los Angeles, for many years attorney for the California Highway Commission, as its chief; and that the proposed creation of the Division of Water Resources to include the present Divisions of Engineering and Irrigation, and that of Water Rights, had been postponed until further legislative sanction for their consolidation could be secured.

C. H. Purcell, newly appointed State Highway Engineer, is considered one of the foremost road engineers in the United States. He resided for a number of years in Los Angeles, attended Stanford University and later graduated from the University of Nebraska. He has had twenty-two years active experience in civil engineering. For the past fifteen years he has devoted himself exclusively to highway engineering, and for the past seven years has been connected with the U. S. Bureau of Public Roads of Washington, D. C., with assignment as District Engineer to the District comprising Oregon, Washington, Idaho and Montana, with headquarters at Portland. Prior to his connection with the U. S. Bureau of Public Roads, Mr. Purcell served as bridge engineer for the Columbia River Highway, Bridge Engineer for the Oregon State Highway Department, and Principal Assistant State Highway Engineer for the same department. An offer of appointment as State Highway Engineer of Oregon was declined by Mr. Purcell.

Mr. Purcell's experience also includes railroad construction and location, smelting and power developments, both in North and South America. He is an associate member of the American Society of Civil Engineers.

C. H. PURCELL.

Mr. Morton, whom Mr. Purcell will succeed, has been State Highway Engineer for the past five years. During this period, the highway organization has been concerned and has successfully dealt chiefly with maintenance problems.

Commenting upon the appointment of Mr. Purcell and Mr. Carleton, Director Meek of the Department of Public Works said: "Mr. Purcell is one of the outstanding figures in highway engineering in the United States today. His experience both in railroad and highway work will be invaluable in the new period of location and construction activities into which the California highway system is now entering.

"For six months I have been making an intensive study of the Department of Public Works both as to its organization and work. The Department covers a very wide field of activities of vital concern to every community in California. I felt that an intimate knowledge of the organization and the work was necessary before changes were contemplated either in personnel or policy. The highway budget announced this month has been the occasion of much study. Mr. Purcell, in my opinion, will bring to the Department an expert knowledge of road problems and highway methods that will be invaluable in the new era of road location and road building into which California has now entered.

C. C. CARLETON.

"I also feel that the appointment of Mr. Carleton as Chief of the Legal Division of the Department of Public Works is one that can not fail to please the people of California. The duties of the Division of Contracts and Rights of Way will be to supervise and coordinate the legal right of way, claims, legislative, and other related activities of the Department. Mr. Carleton's long experience with the state highway organization has made him one of the foremost authorities of the nation upon road contracts and highway practices. He has an intimate acquaintanceship with the affairs of the department of which its various divisions will be the beneficiary. I am extremely pleased that we have been able to again enlist him in the service of the state."

Redwood Grove In Del Norte County Saved by League

DESTRUCTION of a 20-acre tract of redwoods near Crescent City, California, has been halted and the preservation of this area as a public park has been assured through the efforts of the Save-the-Redwoods League in cooperation with the supervisors of Del Norte County and the Division of State Highways.

The grove in question, known as the Webber Tract, is the first piece of timber land reached on the new section of the Redwood Highway when traveling north of Crescent City, from which it is about four miles distant. A short while ago it was discovered that timber operators were rapidly destroying the trees in this tract and marring the beauty of the new highway. Mr. B. B. Meek, Director of the State Department of Public Works, and Mr. Ralph W. Bull, Chairman of the Division of State Highways, presented the matter to the League, which forthwith raised the sum of $3,000, the contribution of a member of the League in southern California. The supervisors of Del Norte County were asked to appropriate $2,500, which they did, thus completing the purchase price of $5,500 for the property.

The acquisition of this property is in accordance with the League's policy of preserving, in so far as possible, the scenic beauty of the Redwood Highway.

In the furtherance of its program the League is urging the passage of the $6,000,000 state park bond issue to go before the voters in November, 1928. It is hoped that by raising a fund to match dollar for dollar with a portion of the proceeds of this state park bond issue, the League will be able to save additional tracts of redwoods.

THE SIX LEGGED TETRAHEDRON

(Continued from page 4.)

cables, the construction of a temporary road into the river bottom, and a ditch which was necessary to deflect the river away from the construction work. The cost of the protection work, including all expenditures, was a little over $7 per lineal foot.

Work was performed by a day labor crew with Foreman Roy Stover in charge.

Mechanical Spreading, Raking, Finishing of Asphaltic Concrete Pavement

By C. S. POPE, Mem. Am. Soc. C. E., Construction Engineer, Division of Highways.

THE desirability of securing a machine which would mechanically spread, rake and finish asphaltic concrete has been evident for many years.

Objection has been made in the past that any machine used for spreading and finishing Portland cement concrete would not be suitable for asphaltic concrete, because the asphaltic concrete would stick to the spreading and leveling devices if they were not heated or oiled, and further, that such machines were not provided with suitable rakes which are essential in asphaltic concrete construction.

C. S. POPE.

It was the belief of the writer that the use of an ordinary spreading machine such as is used for spreading and kneading or tamping Portland cement concrete pavement would not give the results which were desired and, therefore, it was decided to remodel an Ord finishing machine by placing a rake in the machine in such a position that it would satisfactorily rake the material into longitudinal furrows. It was thought extremely important that the furrows should be longitudinal, since the material would then be raked in such a manner that if there was any incipient deformation, it will be through the formation of longitudinal ruts of slight elevation rather than through the formation of transverse waves which are the curse of pavements of this type.

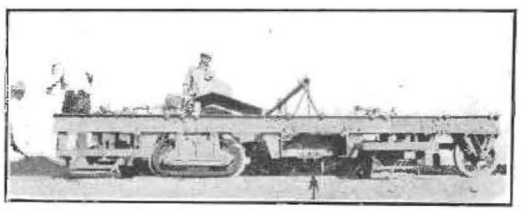
The machine described herein was placed on a contract for asphaltic concrete surfacing, some eight miles in length in Kern County, California, near the town of Delano. Its success was almost immediately evident and led, not only to the purchase of the machine by the contractor but also to the purchase of a similar machine for an adjoining contract of similar length.

DESCRIPTION

The machine consists essentially of a motor-driven steel framework running on flanged wheels resting on the side forms.

A spreading blade which is adjustable for height spans the width of the pavement at the front end of the machine.

Back of this blade, the raking teeth which are inclined to lift the mixture are arranged in rows attached to shafts or channels in such a manner that they may be lifted or given any desired inclination.



View showing rakes of new machine.

So far, the work indicates that two rows of teeth spaced six-inch centers are sufficient.

Such an arrangement forms the furrows three inches on centers and gives a sufficient loosening and distributing action.

Back of the raking teeth is a second strike-off and finishing plate also spanning the full width of the pavement.

Both strike-off plates are set vertical and have a sidewise motion which shears the material and permits the machine to advance with the use of a minimum of power. While the present rakes do not vibrate, it is planned that they shall be arranged to do so in subsequent machines.

The hand wheels, by means of which the strike-off blades are adjusted to the proper elevation, are shown in plate D.

The raking apparatus was, therefore, so arranged that the furrows should be made longitudinally and practically straight. Should a slight waviness of the furrows occur, due to the necessity of vibrating the teeth, it will probably not be found detrimental. The use of teeth is believed essential to secure uniform texture in the mixture upon the road.

In the practice it was found that in cases where the mixture was piled up in front of the screeds or strike-off blades to a greater extent near one end than

Highway Finance Puts on Long Pants

Deputy Director of Department Tells Meaning of Road Budget

By CORNING DE SAULES, Deputy Director, Department of Public Works.

THE ADVENT of the three-cent gasoline tax as the means of providing funds for state highway purposes happily coincides with the advent of complete and effective budgetary control of the state's finances inaugurated by Governor Young's budget to the legislature for the current biennium.

CORNING DE SAULES.

The principles of budgetary finance are much more effectively applicable to the continuous flow of income promised by the three-cent gasoline tax than to the former definite blocks of funds provided by periodic bond issues.

WHAT THE BUDGET MEANS

Administrative control of these current funds, through the medium of a budget, means that it will be possible to formulate plans covering a longer perior of time and according to determined state highway needs with assurance of their completion. By the budgeting of funds in accordance with such plans, the public may be assured that allotments for specific maintenance, construction and reconstruction projects may no longer be switched or diverted to other purposes in response to the pressure of localized ideas or influences.

It means that it may no longer be that the fastest fellow to the state treasury is the first to get completed roads. And that the day of the so-called political road is along with yesterday in the past.

EASIER TO CHANGE THAN TO CONVERT

It would be strange if such a radical change from the preexisting order of things did not elicit some opposition in quarters where the logical restrictions of any effective plan of financial control would be considered irksome. To these "Cant-be-doners" we have neither a message nor an appeal. It is easier to replace than to convert them.

The state highway budget for the current biennium aggregates $47,411,012. Each dollar of this sum is allocated to a definite project, purpose or function.

FIELD PROCEDURE UNCHANGED

The administration of the budget is, primarily, a headquarters function. There will be but little if any change of procedure in the field. The system of work orders and accounts recently devised and installed is designed to furnish the information and data necessary to the successful operation of a budget. It is expected, however, and required that district engineers will be always mindful of their responsibility for the holding of expenditures within the limitations set by approved work orders.

"WORK ORDER" ORDERS

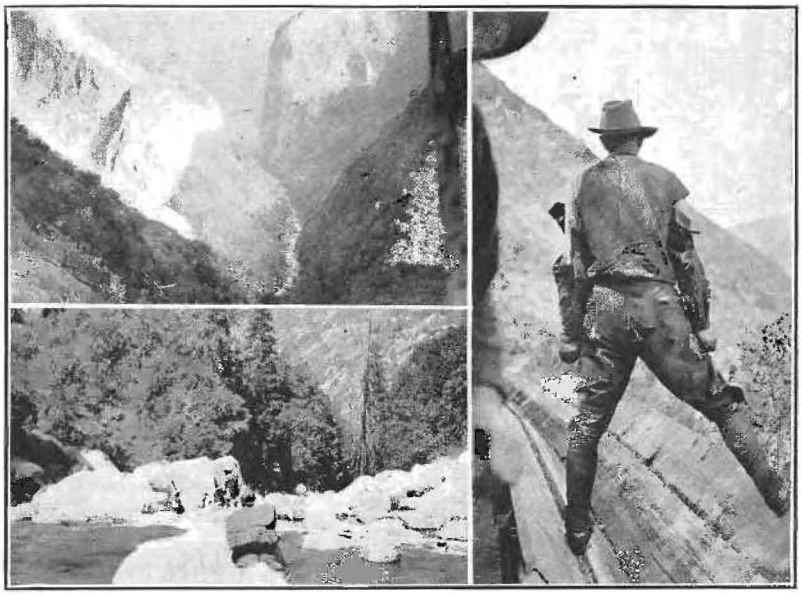
Because it will always be possible to obtain supplemental work orders in the event of actual and obvious need, it will never be necessary or permissible for expenditures to accrue in excess of approved work orders. The application of an unexpended balance of one work order to an overexpenditure of another will no longer under any circumstance be countenanced.

While the administration of the budget is essentially a headquarters task it, obviously, can be made difficult or easy in proportion to the measure of willing cooperation that comes from the staff in the field. It is to these "Builders of California" that we would convey an idea of the privilege that is theirs to have an active part in demonstrating the wisdom and advantage of the new and enlightened order of things pertaining to the completion and maintenance of the state highways.

The task is of sufficient magnitude and importance to test the mettle of all whose imagination is sufficiently alert to visualize the opportunity that is here and ours to discard for all time our former financial swaddling clothes for the long pants of modern maturity.

Surveying in the Kings River Canyon

A reconnaisance survey is in progress in the Kings River Canyon. Picture on the upper left shows the rugged nature of the country through which the survey is being made. Below, the view of members of the party roped together in the bed of the stream. The picture on the right shows the heavy maintenance that the survey requires.



THE PASSING OF "PASSING-THE-BUCK"

(Continued from page 6.)

UNDERLYING PRINCIPLES

Here is the way that Mr. Heron tells the story of a change in State government reorganization and practices which he declares will in time be recognized as of epochal importance to the people of this state:

"The principle underlying the reorganization was that all agencies having similar functions to perform should be grouped into one department under a responsible head. The importance of this will be realized when it is stated, for instance, that previous to the coordination of the various state departments no less than five individual agencies were dealing with the relations of employer and employee, with a resultant overlapping and duplication of activity to the great annoyance of both employer and employee, and to the general disturbance of business. All these agencies today constitute one single Department of Industrial Relations, under a director who is responsible to the general manager of public business affairs, the Governor of the state.

"The second principle underlying the reorganization of 1927 was that of bringing together the responsible heads of these executive departments. They in effect constitute a board of directors for the state. The Council meets with the Governor at least once every month to report for their respective departments, both as regards the policies and the problems of these departments, and to return to their work, each charged with the responsibility of securing results for the people of the state.

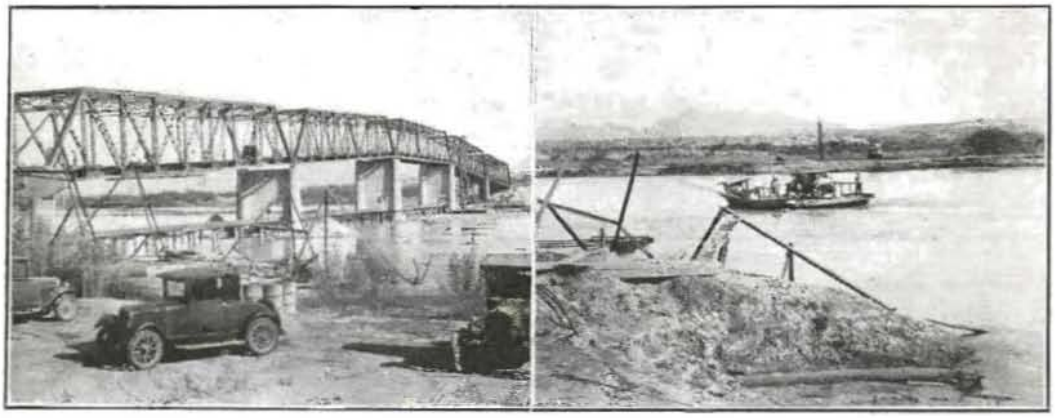
"For the first time in America, a state has a responsible board of executive directors, who meet monthly with the general manager of that great corporation which they represent, namely—the State of California. To this meeting, the stockholders and customers of that corporation are always welcome. The door of the chamber, where the meetings of the Governor's Council are held, is wide open. There are no star chamber sessions or secret discussions."

THE PEOPLE APPLAUD

Mr. Heron is right.

The Governor's Council has made buck-passing exceedingly difficult in the conduct of California's affairs.

And the people are already applauding; although as yet they may but vaguely understand the significance of the great change that has taken place in Sacramento.



The new bridge and the old ferry.

Huge Steel Bridge Replaces Cable Ferry Over the Colorado River

AS THIS issue of CALIFORNIA HIGHWAYS AND PUBLIC WORKS is going to press a new interstate highway connection is being completed in the form of a massive steel bridge across the Colorado River connecting the town of Blythe, California, with Arizona and replacing the cable ferry which has been in operation at this location for years. Although the new bridge is not, in reality, a portion of the California state highway system, it is an extension to Route 64 which terminates at Blythe. It is a Riverside County toll bridge project.

THIRD COLORADO CROSSING

This new bridge is the third crossing to be built over the 250-mile portion of the lower Colorado River forming the boundary between the states of California and Arizona, the two other bridges being at Yuma and at Topoc near Needles. Through its uncertainty of action during flood seasons, the river has been a formidable barrier to interstate travel requiring extensive construction work to bridge it. The cable ferries propelled by the current have had their time at each of the three main crossings but were uncertain and dangerous. With the increase of travel, they have given way to huge steel structures.

TELLS OF DEVELOPMENT

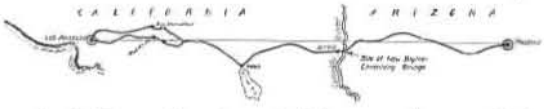
Mr. T. Mahncke, Secretary of the Palo Verde Valley Chamber of Commerce, who has courteously furnished the accompanying photographs writes as follows:

"The opening of the Blythe-Ehrenberg bridge about March 1st of this year marks the completion of another development that is of vast importance to the traveling public, and means the adequate improvement of the Sunkist Trail in both California and Arizona.

"The necessity of developing this short route between Los Angeles, California, and Phoenix, Arizona, has been recognized by economists and engineers for many years. The lack of engineering obstacles and low cost of future maintenance is what is prompting the activity on this short all-year route to Phoenix and the east.

OLD MINING TOWN

"In the early days, when the Butterfield stages crossed the continent, this route was in use to carry passengers, mails and expressage. Crossing the Colorado River near Blythe was made by ferry at the historic Arizona town of Ehrenberg, which about the year 1870 was a flourishing mining town of 5000 people. Ehrenberg was also at one time the county



seat of Yuma County and fate now decrees that the approach to this new bridge pass through the adobe ruins of what once was used as the county courthouse.

"The advent of the automobile has changed the old stage route of 1868 from a rough trail to a modern highway. The new bridge now replaces the cable and power ferries whose progress was often interfered with by torrential freshets and shifting sand bars."

DESCRIPTION OF BRIDGE

The new bridge has five steel truss spans each 190 feet long, a total length of 950 feet. The roadway width is 20 feet and the height

(Continued on page 26.)

Prehistoric Civilization Along the Lower Colorado

By E. Q. SULLIVAN, District Engineer, California Highway Commission.

THE Colorado River is now reached by three California highways all under state maintenance by the Division of Highways—the Yuma, Blythe and Needles routes. It may be of interest to cite evidences of migration of prehistoric people along the river.

Along the lower basin of this great river as far north as Topoc near Needles, certain markings have been found indicating that this region was once well known to the prehistoric races of Arizona and New Mexico who attained civilization far above that of any American Indian. Near Topoc is an area of approximately sixty acres known to us as the "Mystic maze." It is situated on the edge of the mesa overlooking the river. The loose rocks which once covered this area appear to have been raked into parallel rows about four feet apart, the direction of the rows varying in different portions of the area. The effect to the eye is similar to that of a California grape vineyard carefully laid out in rows for irrigating and cultivation.

Huge natural Indian head overlooking the Salton Sea. The ancient beach line can be seen on the rocks above and to the left indicating that the head was once below the surface of the inland sea.

The real occasion for the diligence and effort expended in arranging these rock ridges in straight and regular rows appears not to be known. It is believed by some, however, that this area was the scene of religious ceremonies.

The Topoc-Needles country appears to have been the northern limit of the migrations of these prehistoric people along the Colorado and it is gratifying and picturesque at least to think of these people holding annual meetings say in the summer time and pacing back and forth within the parallel lanes singing or chanting in rhythm with their antics. It is not unlikely that the river itself had a place among the religious beliefs. Its periodical rising, overflowing and receding through climatic changes in the great and remote upper basin could easily have been con-

Mystic maze near Topoc which is believed to have been the scene of prehistoric religious ceremonies.

Indian markings on rock.

(Continued on page 29.)

The January Traffic Count

On January 15th and 16th, a traffic count was taken at various stations on the California Highway System under the direction of T. H. Dennis, Acting Maintenance Engineer. In this article Mr. Dennis summarizes the result of the count. The count for particular stations will be found from pages 32 to 35, inclusive.

In March, 1909, when California's legislature enacted the "State Highways Act," there were some 28,600 vehicles registered within the state. Today, nineteen years later, our motor vehicle registration has reached the astounding total of 1,736,765, an increase of approximately 6100 per cent, or, expressed as a ratio in terms of population, where in 1909 there was one car to every 83 people, there is now one car to every 2½.

In view of this remarkable increase, obviously some assumption as to what the point of vehicle saturation will be and when reached, is necessary for any logical road planning. If we assume the point of saturation to be where there is one vehicle for every 1½ persons, that time can be predicted with reasonable accuracy, as there is a very definite relation between the rising trends of population and motor vehicle registration. The determination of where and to what extent this increase in traffic will affect our highways can likewise be predicted, as vehicles are registered by counties, and it is reasonable to assume present traffic at and between points where traffic is now counted will reflect that increase.

The necessity of determining this traffic became apparent in 1920, as naturally the heaviest traffic would dictate not only maintenance expenditures, but the widening and thickening of pavement surfaces as well.

The 103 stations selected at that time have gradually been increased until at present traffic is being counted biyearly at some 836 stations. In consequence, a measure of the usefulness of California's highways to its people, in terms of vehicle miles use, together with the necessity for their future improvement to meet traffic needs, is readily obtainable for any particular stretch of state highway.

Consecutive counts are taken over two-day periods biyearly, between the hours of 6 a.m. and 10 p.m. Sundays and Mondays are usually selected as typifying the daily variation, the seasonal being obtained by taking the counts during the mid-month periods of January and July.

In the count, vehicles are segregated in hourly periods, under the following classifications: passenger cars, light trucks (loaded and empty), heavy trucks (loaded and empty), horse-drawn vehicles, trailers, busses, and foreign cars; that is, cars registered outside the state.

As a matter of interest, certain salient points have been selected on the various routes for the purpose of comparing counts taken this year on January 15 and 16 with those taken in 1927 over a similar period.

The present census, based on the locations enumerated, show the following increases:

	For Sunday	For Monday
Main north and south routes	15%	7%
Laterals between inland and coast routes	30%	16%
Interstate connection routes	28%	20%
Recreational routes	51%	23%

Gain or loss in count for stations shown expressed as a percentage of similar count taken in 1927:

Route No.		Sunday Gain %	Sunday Loss %	Monday Gain %	Monday Loss %
1.	San Francisco to Oregon line	6			6
2.	San Francisco to San Diego	18		10	
3.	Sacramento to Oregon line via Marysville	6		10	
4.	Sacramento to Los Angeles (Valley Rt.)	11		7	
5.	Stockton to Santa Cruz via Oakland	21			5
6.	Sacramento to Woodland Junction	13		9	
7.	Tehama Junction to Benicia	17		0	0
8.	Ignacio to Cordelia via Napa	38		17	
9.	San Fernando to San Bernardino		7		3
10.	San Lucas to Sequoia National Park	15		1	
*11.	Sacramento to Riverton via Placerville	30			3
12.	San Diego to El Centro		32		18
13.	Salida to Sonora	50		14	
14.	Albany to Martinez	42		4	
15.	Route 1 near Calpella to Grass Valley	29		17	
16.	Hopland to Lakeport	40		34	
17.	Roseville to Nevada City	17		2	
18.	Merced to El Portal	22		2	
19.	Route 9 west of Claremont to Riverside	20		33	
20.	Redding to Route 1 near Arcata	32		12	
21.	Route 3 near Richvale to Quincy	28			2
22.	San Juan Bautista to Route 32 via Hollister	40			7
23.	Saugus to Bishop	24		14	
*24.	Route 4 near Lodi to Valley Springs	159		11	
25.	Nevada City to Downieville	78		59	
26.	San Bernardino to El Centro		2	4	
27.	El Centro to Yuma	13		25	
28.	Redding to Nevada line via Alturas	4			3
29.	Red Bluff to Nevada line via Susanville	1		0	
31.	San Bernardino to Jean	27		21	
32.	Route 4 near Califa to Rt. 2 at Gilroy	60		21	
33.	Route 4 near Bakersfield to Paso Robles	4		5	
34.	Route 4 near Arno to Pine Grove	46		14	
*37.	Auburn to Colfax	113		97	
43.	San Bernardino to Big Bear Lake	9		137	
44.	Boulder Creek to Redwood Park	41			32
47.	Orland to Chico	78		22	
48.	McDonalds to Wendling	31			9
49.	Calistoga to Lower Lake	109		43	
51.	Santa Rosa to Schellville	17		6	
52.	Alto to Tiburon	117		50	
53.	Fairfield to Lodi	15			12
55.	San Francisco to Spring Valley dam	70		23	
57.	Santa Maria to Bodfish via Bakersfield	9		143	
58.	Mojave to Topoc	91		63	
60.	El Rio to San Juan Capistrano		24		15
64.	Mecca to Blythe	98		42	
65.	Auburn to Sonora	55			2
68.	San Francisco to Burlingame	21		3	
71.	Crescent City to Oregon line		5		6

*Snow frolics occasion of high count.

(Continued on page 32.)

New President of Northern Club Sees Bright 1928 Outlook

H. J. Brunnier, San Francisco consulting structural engineer, is the new president of the California State Automobile Association. His selection to leadership of the 76,000 motorists of Northern and Central California members of the northern clubs was made by the Association's Board of Directors at the first meeting of 1928.

H. J. Brunnier.

Other officers of the Automobile Association elected for 1928 by the Board of Directors are: R. I. Bentley of San Francisco, president of the California Packing Corporation, first vice president; D. H. Lafferty of Santa Rosa, mortician and civic leader, second vice president; E. B. DeGolia of San Francisco, vice president of Marsh & McLennan, third vice president; George S. Forderer of San Francisco, president of the Forderer Cornice Works, treasurer. D. E. Watkins was again named secretary and general manager of the Association.

The new president of the Automobile Association has been a member of its Board of Directors for the past eight years. For the past seven years he has been continuously chairman of the Association's Highways Committee and in that capacity has directed the destinies of the organization's Highway Bureau. He has also been a member of the organization's executive and finance committees and has been a vice president of the Association for the past four years. President Brunnier succeeds Burton A. Towne of Lodi, who retires from the Association presidency after two successive terms.

Clear course ahead is the outlook for California motordom along the broad highway of 1928 is the statement made by Mr. Brunnier upon assuming office. Mr. Brunnier cited a few of the factors that promise to make 1928 a record year for motordom. He pointed out that the $47,000,000 two-year program of highway construction just launched by California returns this state to its premier position as the road-building state of the Union.

TIMELY AUTO ACCIDENT PROPERLY "STAGED" PROVES ROAD ARGUMENT

(From the Martinez *Gazette*.)

Crockett, Jan. 28—While Bert Meek, Director of the Bureau of Public Works, and State Highway Commissioner Fred S. Moody, with engineers of the Highway Department, were inspecting the dangerous intersection near the high school here, a passing auto stage was nearly wrecked in avoiding collision with another car at the blind right angle corner.

"That looks like a 'put up job,'" Meek laughingly remarked to Supervisor Oscar Olsson and County Engineer Ralph R. Arnold, who were endeavoring to impress on the state officials the necessity for safeguarding the dangerous intersection.

New York Holds Hot Dog Stand Beauty Contest; 700 Stands Enter Competition

(Associated Press Dispatch.)

NEW YORK, Jan. 20.—Add to the list of outmoded American institutions the hot dog stand, with its thick odor of onions and frying wieners, its greasy counter and its jar of encrusted mustard.

It is to be replaced, if Mrs. John D. Rockefeller, Jr., and the American Civic Association have their way, by the wayside refreshment parlor.

In the first national beauty contest for these roadside rendezvous of hungry motorists, a tiny white hut nestling beside the highway near Plainfield, N. J., has been selected as the best example of a wayside refreshment stand which gratifies the eye as well as the purse and the palate. The Art Center of New York conducted the contest.

Seven hundred proprietors of wayside stands submitted photographs and designs of their places of business to the Art Center in the competition of comeliness for which Mrs. Rockefeller offered $1,000 in prizes.

The Plainfield refreshment stand which won first place is Pinkie's Pantry, owned and run by Mrs. Laura M. Bamman. Built in colonial design under an old apple tree beside the concrete road, it was adjudged the best of the

(Continued on page 27.)

Feather River Lateral Route Decision

RECOMMENDATION that the North Fork of the Feather River be selected for the location of the state highway between Oroville and Quincy, with a proposed future extension of the road east to establish an interstate connection at the Nevada line was made February 17th to the members of the California Highway Commission by B. B. Meek, Director of the State Department of Public Works, and was officially adopted by vote of the Commission.

This road is expected, because of its freedom from snow, to become the major artery for winter travel into northern California.

Mr. Meek's recommendation that the North Fork routing be officially selected was based upon two premises:

1. An opinion by Attorney General Webb, concurred in by C. C. Carleton, Attorney for the Department of Public Works, that the State Highway Commission is obligated to the North Fork routing by the constitutional amendment of 1919. This was the act in which $40,000,000 of state highway bonds was voted. The road in question was included in that issue under the designation "The Feather River Route from Oroville to Quincy."

2. Reports by engineers of the Division of Highways that the North Fork would serve travel better than other suggested locations. The travel that would be more adequately served by a North Fork highway than by other proposed roads are classified as follows: recreational and commercial travel originating in California; travel between California and eastern Oregon, southern Idaho and northwestern Utah; tourist travel originating in the East and principally seeking recreational attractions.

The opinions of Attorney General Webb and Attorney C. C. Carleton that the constitutional amendment of 1919 obligated the State Highway Commission to the North Fork route was without proviso or qualification. The opinions held that all discretion in the matter had been withdrawn from the Commission by that act. Webb held that the act of 1919 substituted a definite North Fork routing for the provision of previous bond acts under which the construction of the Oroville-Quincy lateral had been authorized as a county seat connection. The present legal obligation to choose the North Fork route, Attorney General Webb declared, could not be avoided by reason of any ambiguity or vagueness in the description of the road as given in the $40,000,000 bond act. The intent of the act, he ruled, was capable of such easy and exact determination that there could be no uncertainty in the matter. This is the first time the Attorney General's formal opinion has been requested by highway officials.

Engineering reports relative to the routing centered about construction costs, mileage differences and the probable traffic use of the different routes proposed for suggested locations for this highway. Traffic, however, became the determining factor in the final recommendation of the Director. The conclusions as to traffic use were largely based upon studies as to points from which travel using the road would probably originate, and the probable destination of such traffic.

Engineering studies included the canyon of the North Fork of the Feather River; canyon of the Middle Fork of the same stream; and the so-called Ridge route, along which the present road between Oroville and Quincy is now situated, all of these routes being in the Feather River drainage area. The studies eliminated the latter route at an early stage and centered around the comparative advantages of the North Fork and Middle Fork.

Reports of the engineers assigned to these investigations showed that a road along the Middle Fork of the Feather River would be 24.6 miles less than the North Fork as between Oroville and the Nevada line, and 7.7 miles less between Oroville and Quincy. The following are the distances:

Oroville to the Nevada line: via the Middle Fork, 124.25 miles; via the North Fork, 148.85 miles.

Oroville to Quincy: via the Middle Fork, 73.3 miles; via the North Fork, 81 miles.

Cost estimates were given as follows: Oroville to Quincy via the Middle Fork, $6,359,-880; via the North Fork, $7,665,407.

The reports indicated that the presence of and cost of removing snow was not a serious problem on either location.

Against the lesser distance and lower construction cost of the Middle Fork, engineers reported that the North Fork offered a traffic

advantage that the Middle Fork did not possess.

A North Fork highway, the reports state, will serve recreational and commercial travel originating in California much better than a road along the Middle Fork. The chief recreational areas of the Feather River district, its larger industries and its principal settlements are situated, so the engineers report, to the north of the North Fork, and tributary to that stream rather than to the Middle Fork. It was predicted that this travel would constitute the bulk of traffic using the highway.

The North Fork was also declared to offer a shorter route between points in California and northern Nevada, southern Oregon and northwestern Utah than that of the Middle Fork.

The same reports held that transcontinental travel using the highway would be chiefly that of tourists to whom increased recreational attractions would be of greater importance than decreased road mileage.

It was the opinion that the advantages that the North Fork would afford to travel outweighed the advantage of lesser cost and lower mileage offered by the Middle Fork. Accordingly, Mr. Meek's recommendation was based both upon the traffic merit of the North Fork and the opinion of Attorney General Webb that the selection of the North Fork was obligatory upon the Highway Commission.

Mr. Meek's recommendation contemplates the construction, largely by convict labor, of a road with a minimum width of 20 feet, and with a minimum curve radius of 100 feet. Immediately upon the adoption of the route by the Highway Commission, engineers will begin final surveys and arrangements will be made for the installation of two convict camps upon the road. Pending completion of the road, the present Oroville-Quincy road will be maintained by state forces.

Announcement was also made that the new highway does not contemplate the utilization of the road built in the North Fork Canyon by combined efforts and joint funds of the Great Western Power Company and Butte and Plumas counties. The poor alignment of this road and its steep and adverse grades would require, to make it safe for traffic, an outlay of expenditure not warranted in the opinion of the engineers on a road later to be entirely abandoned. It is also stated that the location of this road is close to high power lines of the Great Western Power Company, and that its proximity to and location above the Western Pacific tracks offers building difficulties that make it inadvisable to attempt its use.

In general the new road will leave Oroville and proceed directly up the main Feather River and the North Fork to the West Branch of the North Fork. It will leave the North Fork there, cross over the top of Big Bend and descend into the North Fork again at a point near Pulga. From there on it will cross and recross the North Fork to secure a location on opposite bank of the river to that occupied by the Western Pacific. It will leave the North Fork at Howell's and proceed by the East Branch of the North Fork to Paxton. From there the route generally follows Indian Creek and Spanish Creek to Quincy.

The road will follow the river closely in order to afford travel opportunity of enjoying the beauty of the stream, and to make possible the maximum recreational development of the river.

The detailed routing is as follows: The highway will begin at the easterly limits of Oroville, traversing rolling foothills to the northeast for about five miles to the entrance of the Feather River canyon. It will cross both the Western Pacific tracks and the river at this point with one bridge. It will then follow the north bank of the river to the junction of the North Fork and Middle Fork, and thence along the west side of the North Fork to the mouth of the West Branch of the North Fork.

Continuing, the route follows the West Branch for half a mile, and then crosses Big Bend to Jarboe Gap, the elevation of which is 2400 feet. From there it again descends into the canyon of the North Fork to a point near Pulga, crossing both the railroad and the river at this place, and taking the opposite side of the river to that occupied by the Western Pacific. This bank of the river is followed to Tobin, where the river is again bridged to avoid the railroad, which at that point also crosses the stream. The road follows the north bank of the river to the junction of the North Fork and the East Branch of the North Fork at Howell's. Another crossing is made here. The East Branch is then followed to the junction of Indian Creek and Spanish Creek at Paxton. Thence the road follows Spanish Creek to Keddie. About a mile below Keddie the road leaves Spanish Creek and proceeds southerly over a low divide. Spanish Creek is again crossed just before the road enters Quincy.

Figures just compiled by the Department of Commerce show that the cost of travel by airplane per mile is 31.28 cents. Post Office Department figures during 1926 show that the average cost per mile, for carrying the mail, was $1,087.

COMMUNICATIONS

Motor Vehicle Department Helps

January 18, 1928.

Mr. F. C. Snook, Chief,
Division of Motor Vehicles,
Sacramento, California.

Dear Sir:

I wish to express our appreciation of the efforts of your forces in advising of pavement defects and dangerous conditions along the highway.

While the cooperation extended has been uniformly excellent and very beneficial, our Foreman Lauritzen in Sonoma County feels that your man in that district, Mr. E. Roberts, is particularly deserving of mention. I quote herewith comment of Foreman Lauritzen.

> "During the past few years the traffic officers in this section have cooperated with us in every way. They have been exceptionally prompt in reporting breaks in the pavement, slides and other dangerous conditions.
>
> I especially wish to mention Mr. E. Roberts as one who seems to take considerable interest in the upkeep of the roads. While off duty in the evenings he has carried lanterns in his car, so in case of any mishap he could immediately warn the public. On his days off duty he has regulated traffic for us while we were painting traffic stripes, phoned to us on nights when there was a possibility of any danger, removed obstacles from the traveled way, and in numerous other ways showed his courtesy and efficiency as a traffic officer."

Yours very truly,

T. H. DENNIS,
Acting Maintenance Engineer.

Bay Shore Commendation

San Francisco, January 27, 1928.

California State Highway Commission,
State Building, San Francisco.

Gentlemen: Tendering to your honorable body the compliments of this holiday season, the Down Town Association takes the opportunity to express its appreciation of the excellent service you have done in promoting the development of California's state highway system, especially in the bay district and more especially on the San Francisco peninsula.

As a steadfast advocate of a second main highway from San Francisco to San Jose this Association realizes your intelligent understanding of the urgent need of such an outlet and your prompt action toward extending the Bay Shore road. This feeling is intensified by knowledge of the many projects in all other parts of the state which are pressed upon your attention and demand your careful study.

With good reason for trusting that during 1928 there will be no cessation of the energy you have displayed in responding to the appeal of the peninsula communities for additional facilities to relieve their ever-growing volume of highway traffic, we are

Very truly yours,

CONSTANT J. AUGER,
President.

T. P. ANDREWS,
Chairman Highways Committee.

A copy of the letter was sent to Governor Young and brought the following response:

"Thanking you for the letter which the Down Town Association sent to our State Highway Commission, I believe that you will find this Commission very active and vigilant in its attention to the highway needs of our state, and I am naturally pleased when an organization such as yours sees fit to recognize the work the Commission is doing.

Yours very sincerely,

C. C. YOUNG, Governor.

WORLD RIDES PAST EL CAJON'S DOOR IN ITS MOTOR CARS

(From the El Cajon Valley *News*, January 20, 1928.

The State Highway Commission of California requires its employees to report about twice a year as to the number and variety of cars being used on the system throughout the state, and last Sunday and Monday, J. D. Reeve, who has charge of the maintenance station east of Bostonia, performed that duty, assisted by the employees of the station.

The observation took place on the state highway west of El Cajon and travel was checked from 6 a.m. until 10 p.m., vehicles of all kinds passing both ways being noted.

During that time Sunday, 5249 vehicles passed, only one being horse drawn. All the others were propelled by gasoline power.

Of the total Sunday, 266 cars bore license plates from other states and countries than California. Baja California was represented by four, British Columbia by 2, and the District of Columbia, Hawaii and New Zealand by one each.

Of the 48 states in the Union, 41 were represented in the procession.

On Monday, 3350 vehicles passed and only two of them were horse drawn. The proportion of trucks to pleasure cars was somewhat larger than on Sunday and of the total 115 bore license plates from other states and countries.

STEEL BRIDGE REPLACES CABLE FERRY OVER COLORADO RIVER

(Continued from page 20.)

of the floor above high water is 30 feet.

It will be of interest to note that a straight line drawn across the map between the cities of Los Angeles, California, and Phoenix, Arizona, passes through Beaumont and Banning in the San Gorgonia pass and follows closely the route of the Sunkist Trail passing only a few miles north of the new bridge. With the age of motor transportation and highway development now in progress this route bids fair to become one of the main thoroughfares as in the days of the Butterfield stages.

Automobile production in the United States during November was 133,202 passenger cars and trucks, compared with 256,300 cars and trucks produced in November of last year, according to monthly production figures of the Department of Commerce.

Story of Pioneer Mountain Springs Highway is Told

THE January issue of *Concrete Highways and Public Improvement* contains a most interesting article on the Mountain Springs grade on the San Diego-El Centro Highway, written by Sam S. Porter, chairman of the Good Roads Committee of the San Diego Chamber of Commerce. The article is of value to real estate and gives an interesting historical account of the road and its development. In part Mr. Porter writes:

In the bleak region between the Colorado River and the Pacific coast a modern highway of concrete has been cut through the mountains and deserts which in the days of the gold rush took heavy toll in hardship and death of the hardy pioneers who sought to traverse the then little known country. Today, the highway engineer has blazed easy routes for motor travelers and has gone farther and laid over the mountains a gigantic ribbon of concrete to make the way smooth, easy and safe.

The new section reaches from the summit of the divide which separates the drainage basins of the Pacific Ocean and the Colorado River to the foot of the east slope by way of the Mountain Springs Grade. The highway takes its name, Mountain Springs Road, from the old relay station which in early days furnished fresh horses and brief rest for stage coach travelers, but today serves gasoline and supplies to the motorists who speed by on their way to the Pacific.

The original road was cut in the rocks that cover the area through the cooperative efforts of San Diego and Imperial counties. From time to time, after it became a part of the stated highway system, money was allotted to improve the tortuous trail and to widen it. Maintenance of the unpaved surface was heavy and as soon as the final alignment was made and money available, the California State Highway Commission scheduled the section for additional betterment and paving. A 20-foot cement concrete pavement was selected for the improvement and contract was awarded in August, 1926, to the firm of Jahn and Bressi, Los Angeles contractors.

The Mountain Springs Grade road is a revelation in location and alignment, easy curves and grades, safety features of superelevation and curb provision on the canyon side. These, with the character of the paving built, reveal the progress the California Highway Commission has made.

Grading for the pavement on the Mountain Springs Grade presented some unusual difficulties. Due to the character of the ground, largely rock, surfacing dirt had to be hauled in and spread over the grade to provide an even, uniform sub-base. With superelevations and reduction of grades, lengthening curve radii and increasing sight distances, a tremendous amount of earth and rock was moved. In many cases the rock was blasted several times before the pieces were small enough to be handled by a gasoline shovel.

As the result of a ruling of the supreme court of North Carolina, automobile drivers arrested for drunkenness are sentenced to shoveling dirt and repairing highways in the state.

MINNESOTANS SNOWBALL SNOWPLOWERS; NEW WAY TO KEEP TRADE AT HOME

(From Minnesota Highway *News*.)

Snow plowing has many thrills, but a new experience was reported to the state highway department last week by one of the district maintenance superintendents in western Minnesota. One of his snow-plowing crews approaching a village midway between two larger towns was met by a crowd of about 150 business men and other residents of the village who bombarded the snow-plowers with snow balls until they were forced to turn around. The excuse was given that if the road were opened some of the trade would go to the larger towns nearby.

NEW YORK HOLDS HOT DOG STAND BEAUTY CONTEST

(Continued from page 23.)

lot in point of practical and sanitary arrangement of service space, sightly arrangement of its wares, attractiveness, method of advertising, and economical use of facilities.

Second prize went to the Beehive, near Troy, N. Y., a severely simple utilitarian stand; third place to Young's stand outside of Ontario, Cal., and fourth to another California stand, the Hut, near San Diego, a ground-hugging little nook with palm-leaf thatched roof which the judges said harmonized admirably with the surrounding scenery.

ADJUDICATING WATER RIGHTS IN CALIFORNIA

(Continued from page 10.)

agency of the State Division of Water Rights, which acts as a fact-finding body for the superior court. Where only appropriative rights are involved, the proceeding may be initiated directly by the division, but if riparian or prescriptive rights are involved the proceeding must first be initiated in the superior court and then transferred to the division for investigation as referee.

To date the division, and its predecessor, the State Water Commission, have undertaken twenty adjudication proceedings, of which nine have already been terminated, and four others have been finally submitted to the superior court and are pending decrees. The results have been uniformly successful in avoiding trouble.

Mountain Roads of Northern Counties Open Despite Snow

By S. W. Lowden, District Maintenance Engineer.

IN ORDER to facilitate the transportation of winter freight and passengers over the highways, the snow removal program of District Two is in full swing.

Modern machinery available the present season has added new zest to the crews, with the resulting improvement to the traveling conditions and reduced costs to the state. On the section between Dunsmuir and Weed, Route 3, has been stationed a rotary plow, powered by a 60 h.p. tractor. On the section between Westwood and Susanville, Route 29, a smaller rotary plow has been placed, powered by a 30 h.p. tractor.

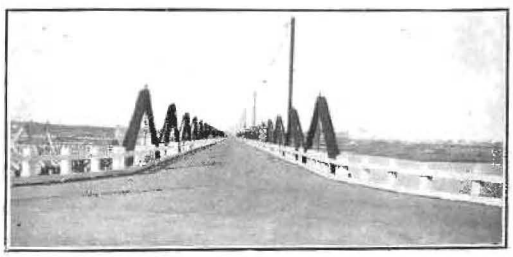
The rotary type has proven very effective. The rotors throw the snow from 30 to 40 feet laterally, and the snow cloud at times reaches a height of 20 feet. Fully 60 per cent of the snow picked up is thrown clear of the roadbed on the first trip. One noticeable advantage secured by this method of removal is the absence of an objectionable windrow of snow on the sides where, due to the concentration of the snow fall at this point and subsequent melting, trouble is likely to occur by reason of the excessive saturation of the subgrade. By the absence of a high snow bank, the formation of drifts has been retarded, as well as gutters and culverts being left in a condition to better handle the drainage, at a time when this is most urgently needed.

BEGIN WITH STORM

With the rotary type plow, as well as with the blade type, removal operations start with the storm, or as soon as the snowfall reaches a depth of two or three inches. The practice is to clear twelve to fourteen feet in the center of the roadway, by blade type plows, towing grader or truck plow, windrowing the snow on the side. This operation is followed immediately by the rotary, working on the banked snow, picking it up and throwing it clear of the roadbed. This method is economical, in that it permits the rotary to remove in one trip the snow it otherwise would require three or four trips to accomplish. Traffic is also better protected, as the greater speed of the lighter equipment allows a greater mileage to be covered on the preliminary removal. By keeping the heavier equipment on the side, an opening of reasonable width is maintained for passing traffic.

Rio Vista Bridge is Opened to Traffic

The approach to the Rio Vista Bridge on Route 53 built by special legislative appropriation of $80,000, has just been completed and opened to traffic.



View of Rio Vista Bridge.

The bridge consists of 41 forty-foot timber truss spans and a 30-foot flair approach span connecting to the levy road. The bridge provides a clear width of roadway of 24 feet. The trusses are supported by creosoted Douglas fir piles varying from 80 feet to 90 feet in length. Bracing on the piles at the deepest point in the stream bed was placed by divers. The deck and trusses were constructed of Douglas fir timber treated with two brush coats of creosote oil.

Conforming with the existing bridge, over the main channel of the river, which has a lighting system, the approach was lighted with General Electric highway lighting units spaced at 240-foot centers installed at a height of 30 feet above the roadway.

BLADE PLOWS

On the sections from Montgomery Creek to Burney, Route 28, and from Paynes Creek to Mineral, Route 29, regions of lighter snowfall, blade plows of the balancing type have been stationed. These plows are giving very satisfactory results, and no difficulties to the traveling public are being encountered in traveling over these sections of highway.

Blade plows of the nonbalancing type are stationed on Buckhorn Summit, Route 20, and Cedarville Pass, Route 29, together with the usual accompaniment of lighter equipment.

The snow removal work done by the state forces, toward the keeping of the highways open at all times, has been the occasion of many favorable comments recently, most notable of which is a letter from the Westwood Auto Club, in appreciation of the effective work being done on Fredonia Summit, between Westwood and Susanville, by the state forces under Maintenance Superintendent E. J. Gribble.

CARING FOR THE DANGEROUS INSANE

(Continued from page 12.)

There is for instance, the case of one patient who, while confined to a particular ward, performs his duties with a high rating of efficiency. This man labors under the impression that he is being detained to satisfy the desire of others. Should this man escape, he no doubt would have but one thought in mind, that of assassinating certain persons whom he believes are responsible for his detention. This includes members of his own family.

One can realize from the above instance the problem involved in the housing of this type of insane person. Its solution as far as the housing problem is concerned has been accomplished as follows:

On the first floor is an entrance lobby, office, visitors' room, dining room, pantry, shoe room, clothes room, wash room, shower room, dressing room, general toilet room and 29 single rooms.

The second floor contains a hydriatic room for the hydrotherapy treatments which are the major treatments, wash room, general toilet rooms, an assembly and day room and 37 single rooms, all single rooms being approximately 7 feet 6 inches by 11 feet 6 inches.

Both floors of the building have necessary storage rooms and closets, night watch quarters and wide 8-foot corridors. The whole building has an abundance of natural light and ventilation and represents the last word in sanitation. Food is prepared in the institution's main kitchen and brought to this unit in containers where it is served from the pantry.

One of the many features of this building is the window opening arrangement. Windows are enclosed with steel sash and frames divided into small panels of wire glass. This makes it impossible to shatter the glass area or to make an exit should a glass panel be removed. The area of the window to open is constructed of double frame and muntins. The exterior section is glazed and the interior section unglazed and stationary, thus making a guarded opening after the exterior section is swung open. Metal rolling screens cover the openings. This style of window opening does away with the old method of installing steel bars, but still maintains an adequate degree of safety.

The capacity of the building for the present is 66 patients. However it is designed and constructed so that additions may be built later, the ultimate planned capacity being 300 patients. As the assembly and day room, dining room and pantry are centrally located it was necessary to build them of a size to meet the future capacity.

The assembly and day room has a projection room in connection, which enables the showing of films.

Four of the single rooms on the second floor are arranged to detain a patient in one room while under special observation.

The wash rooms, general toilets and shower rooms have tile floors and walls. The hydriatic room includes a continuous bath, ice pack sink, electric cabinet, sitz bath and showers, all being controlled by a series of Leonard control valves operated by an attendant which regulate the temperature of water to be used. The floors, walls and ceilings are covered with tile. All other floors of the building are covered with linoleum.

In the rear of the building is a yard enclosed with a masonry wall to permit sunning and exercise. The yard is provided with seats, shelters, walks and toilets. A heater room is located in the basement where a steam control valve is placed which functions in the capacity of distributing steam from the high pressure line which is supplied from the institution's central boiler plant. A hot water storage tank and the main electric switchboard of the building are also located in the heater room.

The structure will be practically fireproof. It is built of reinforced concrete construction, having on the exterior a brick veneer base, stucco finished walls and clay tile roof of variegated colors. The design of the building is of rambling English style. The site of the building on the grounds of the Mendocino institution with its large spreading trees and natural shrubbery makes a pleasing and harmonious setting. Walks and drives are being constructed which will bring the building within easy access from the main institution's executive section. The Division of Architecture feels it will have accomplished a project and a purpose heretofore unsolved in the west with the completion of the special custodial unit at the Mendocino State Hospital, providing as it will for the confinement of all anti-social cases of insanity within the State of California.

PREHISTORIC CIVILIZATION ALONG THE LOWER COLORADO

(Continued from page 21.)

strued as supernatural phenomena. Hence the location of the "Mystic maze" on a site overlooking the river.

On the banks of the river between Yuma and Blythe are numerous markings on rocks which are beyond all question the work of human hands. The work involved in carving these figures with the crude tools known to have been in use by the prehistoric people would indicate that the story thus written was well worth writing. With this story is an unwritten and long forgotten story, perhaps equally significant and interesting, the story of the author, who he was, when he lived, and the motive for his work.

The Colorado River can be reached in about one day's drive from Los Angeles by three partially improved highways. Yuma, Arizona, can be reached via the Los Angeles and Imperial Valley and Borderland highways; Blythe can be reached by the Los Angeles to Imperial Valley highway and the Sunkist Trail via Thermal and Mecca; and Needles and Topoc can be reached via the Old Trails highway. The season for touring in this district is now at its best and will continue until about the first of May, providing a splendid opportunity for winter outing.

A total of 342,201 automobiles from the United States entered the Province of Ontario during the season of 1927, spending $40,696,650, and represents an increase of 48.01 per cent over 1925, according to announcement by the American Motorists Association headquarters at Washington.

MECHANICAL SPREADING, RAKING, FINISHING OF ASPHALTIC CONCRETE PAVEMENT

(Continued from page 17.)

Ordinarily, the spreading of surface course 1½ inch in thickness is a difficult matter but with this machine, it presents no difficulty whatever.

With asphalt concrete running from 1200 to 1800 tons per mile on 20-foot resurface at about $5.50 per ton, the possible economy is readily apparent.

The immediate decrease in hand labor is not at once apparent though on one contract the labor crew is reduced to nine men including the foreman and machine operator for the spreading of 400 tons of mixture per 8-hour day. It is probable that future work will show a further reduction in labor so that the ultimate saving in men will be sufficient to influence a reduction in the prices bid for paving.

On asphaltic concrete spread by hand methods, tests made under the direction of the author indicate that an average smoothness of 18 units of roughness per mile, as shown by a roughometer, such as is used by the Bureau of Public Roads, was about the low limit that could be expected. This was about three times the roughness obtained on the best Portland cement concrete pavement on its completion.

The first few days' use of the asphalt concrete finish machine indicated that a roughness of not more than 10 units per mile could readily be obtained and that side sway of motor cars due to uneven cross-section was greatly reduced.

Since it is necessary to move the machine back on the job for the construction of surface after having laid base, means must be provided for its rapid transportation.

It is the opinion of the writer that the development of this machine presents a distinct advance in the art of paving as applied to asphaltic concrete and one that will have a far-reaching effect on the use of this material.

While the original idea of a mechanical finisher and its general details originated with and was pushed to a conclusion by the author, credit is due to many others for thoughts and ideas contributed during the construction and operation of the trial machine.

During May, 1927, W. F. Herin, Assistant Resident Engineer, and H. B. LaForge, Resident Engineer, in discussing the matter of more efficient spreading, advanced the idea that material might be spread by the use of strike-off blades drawn by hand. The author felt that it would be necessary to include a rake for the experimental work and that eventually the whole operation should be done by machine.

The first experiments were carried out by Mr. Earl Withycombe, Assistant Construction Engineer, on work near Merced and near Larkspur. These were so successful that arrangements were made with the Edward R. Bacon Company to secure an Ord tamper which was remodeled for the more extensive experiment. This machine was put in use as stated before during the latter part of September or early in October. Many points had to be worked out in the field for which great credit is due to Mr. Withycombe and also the contractors, Force, Currigan & McLeod who assisted in putting the machine on a sound working basis. There seems little doubt that the small expense to which the state has been subjected in the development of this machine will be repaid many times over in the better and more economical pavements which can be laid with this method.

SACRAMENTO-SAN JOAQUIN WATER PROBLEMS

(Continued from page 8.)

MUTUAL AGREEMENT WORKS

In the 1924 agreement adopted by the Permanent Committee and signed by the water users, provision to meet the immediate season's crisis was made in specifying the duties of and delegating certain authority to the Water Supervisor as respecting conservation measures and waste prevention. Looking more to the future, however, and to the ultimate solution of the problems it was specified that the Water Supervisor should commence the engineering investigation, the collection and recording of the hydrographic facts, most essential to an intelligent and permanent settlement in water difficulties of this nature.

The success attendant upon the 1924 conservation efforts was most noteworthy. The water users acceded readily to requested measures and accomplished much in the way of waste prevention and a careful use of water. After June there was not sufficient flow in the Sacramento River above Sacramento to maintain navigation, and, taking a lenient attitude, no attempt was made on the part of the U. S. War Department officers, charged with the maintenance of navigation, arbitrarily to enforce the superior legal rights of the federal government in this respect by enjoining water diversions. This confined the problem chiefly to the irrigationists and the pressing necessity of keeping fresh water flowing to the delta to save great areas of valuable crops there from the salt water encroachment.

WORTH WHILE SAVING

Through appeals made to the up-river water users by delta owners, members of the Permanent Committee and others at a meeting of water users called at Colusa by the committee at the time of the crisis in the last of July, the river flow was decidedly increased, and the salinity actually driven back many miles in the Sacramento Delta. The estimated saving to the delta resultant therefrom was decidedly worth while.

MEASUREMENTS AND RECORDS

The engineering and investigation commenced in 1924 and continued to date has included the following: Measurements and records of all diversions of water from the Sacramento, Feather, Yuba, American and Lower San Joaquin rivers within the valley floor and above the delta; stream flow

measurements throughout the territory, partially in cooperation with the Water Resources Branch, U. S. Geological Survey; measurement and record of waters returned to the Sacramento and San Joaquin rivers; intensive studies of the duty of water on peat and sedimentary lands in the delta region in cooperation with the U. S. Department of Agriculture, Division of Agricultural Engineering; yearly census of irrigated areas and crops under all diversions recorded and throughout the delta; and investigation and study of the advance and retreat of salinity in the delta channels.

PUMP DIVERSIONS PREVAIL

With the exception of four large gravity systems, all of the diversions recorded are by pumping. The diversion records obtained in 1926 included 211 on the Sacramento River above Sacramento, 35 on the Feather River, 6 on the Yuba, 29 on the American and 34 on San Joaquin River channels diverting to the delta uplands. The Sacramento River records show that there was a draft above Sacramento amounting to 953,000 acre-feet in 1924, 842,000 in 1925 and 1,104,000 in 1926. A considerable portion of this draft is returned to the river, however, and the return water is available for use in the lower river and delta. The flow of all channels carrying this return water to the river is measured and recorded. The 1924 measurements indicated a return above Sacramento for the four months, June to September, equal to 33 per cent of the draft. The 1925 figures showed a corresponding return for July to October equal to 40 per cent, and the 1926 return was 31 per cent. Each season three complete series of return water measurements have been made on the San Joaquin River and tributaries.

RIVER FLOW AND DRAFT COMPARED

It is interesting to note the relation between river flow, irrigation draft and return waters in the section of the Sacramento River between Red Bluff and Sacramento. In the month of July, 1926, there was an average draft of 3850 cubic feet of water per second, yet with a flow of only 3190 cubic feet per second at Red Bluff and a combined inflow of 660 cubic feet per second from the Feather and American rivers, there was a flow of 1880 cubic feet per second passing Sacramento. The return water, therefore, between Red Bluff and Sacramento amounted to 1880 cubic feet per second. Of this amount, however, 330 cubic feet per second was water reaching the river as return from lands irrigated by Feather River diversions.

DATA DIFFICULT TO GET

Within the delta it is not feasible nor practical to measure and record the countless number of diversions by siphon, gravity and pumping as well as the concurrent drainage pumping, which is considerable. Here the consumptive use of water must be estimated by applying the best "duty of water" figures obtainable to the various areas irrigated and cropped as shown by the yearly census. The proper determination of the "duty of water" data for peat and sedimentary soils, for different crops, etc., is the somewhat difficult task here involved. The detailed and intensive investigations along this line to date have been conducted on Medford and King Islands near Stockton for the peat soils, and on Reclamation District 999 near Sacramento for sedimentary soils. This work required the installation and use of many different water measuring devices and calls for a considerable amount of ingenuity and skill upon the part of engineers in getting reliable results.

THE SALINITY PROBLEM

The encroachment into the delta channels of salt water from San Francisco Bay when in dry seasons there is insufficient flow of fresh water in the rivers to hold it back is a serious problem. Each season investigations have been carried on to determine, by means of testing water samples taken at two- or four-day intervals at stations throughout the delta, the movements and behavior of the salinity. Chief of the objectives in this work is the determination of the relation existing between the advance and retreat of the salt at various delta points and the discharge of the rivers to the delta. With records of the Sacramento River flow at Sacramento and the San Joaquin River flow near Vernalis, available since 1924, the work to date has demonstrated this relation within somewhat wide limits. Should reservoir storage become available at some future time as a means of controlling the salinity, the value of a knowledge of the required discharge and proper time for storage release is obvious. As an aid to the delta irrigators in avoiding the use of water with too high a salt content, bulletins showing the results of tests are mailed throughout the delta once a week during critical periods.

1926 AND 1927 HIGHLIGHTS

The run-off of the San Francisco Bay drainage for the year 1926–1927 was 108 per cent of normal and in the 1927 irrigation season there were no difficulties encountered except in the maintenance of a sufficient flow for navigation in the vicinity of Colusa. Here

the flow dropped to a minimum of 2000 cubic feet per second. Salinity to the extent of 100 parts chlorine per 100,000 (roughly, the danger mark in irrigation) did not reach higher than a short distance above Antioch and Collinsville. The run-off for 1925–1926 was only 55 per cent of normal and during the season of 1926 both irrigation and navigation difficulties required considerable work in the way of conservation and waste prevention. Excellent response from the water users was received and all that could be accomplished through waste prevention and voluntary diversion reductions was done. In spite of this, however, it was not possible to maintain navigation throughout the season and this could only have been accomplished by more drastic measures eliminating some of the areas watered. Salinity of 100 parts per 100,000 encroached above Rio Vista and as far as Bouldin Island and Palm Tract in 1926.

SECOND CONFERENCE CALLED

At the close of the 1924 season's work which, it should be noted, was almost entirely financed by the water users themselves to the extent of some $17,000, a second River Problems Conference was called. This was held at Sacramento on December 12, 1924. The season's work was reviewed and the Permanent Committee presented its report and recommendations. This conference voted to continue the committee and recommended that the state legislature be asked to appropriate funds to continue the work of the Water Supervisor. This the legislature did and the last appropriation insures the continuation of the work until July 1, 1929.

PROGRESS REVIEWED

With the completion of the fourth season's operation under the methods and plans initiated by the 1924 Water Users Agreement, an outcome of the First River Problems Conference, an opportunity is presented to review such progress as may have been made in dealing with Sacramento-San Joaquin water problems.

Of prime importance, the efforts to date have come as a result of, and have strengthened, the spirit of cooperation, welding together the various diverse interests so as to make the best of the situation and avoid expensive and extended litigation. Following the Antioch suit, one of much greater proportions was filed. The loss in time, money and retarded development which would be entailed by the trial of this suit is fearful to contemplate. But with the action of the River Problems Conference, the Permanent Committee and the state for a constructive solution of the difficulties this suit has not been pressed.

In the Permanent Committee and River Problems Conference there has been created a most fortunate medium for dealing with the problems involved; and at present, the committee, influential and representative, stands ready as the proper body to forward all constructive plans for bettering the river conditions.

In the collection of the four years' records of the use of water and other fundamental physical facts and data, a necessary and important step has been taken leading to the ultimate adjudication, mutual agreement or other adjustment which may be consummated as a basis for water distribution.

The procedure to date has been to make the best of the situation through conservation. This includes water supervision or water master service which is essentially a conservation feature. Until such time as additional water supplies are made available through storage or otherwise, this will undoubtedly continue to be the best and only reasonable procedure.

TRAFFIC CENSUS

(Continued from page 22.)

Route 1. San Francisco to Oregon Line.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
San Rafael, north of city at top of hill	3,383	1,972	4,299	1,609
Petaluma north of city	3,866	4,096	4,945	3,871
Santa Rosa, south of city. Triangle service station	2,467	1,902	2,798	1,821
Santa Rosa, north of city at railroad crossing	2,812	2,395	3,079	2,472
Healdsburg, south of city at railroad crossing	1,894	1,511	1,797	1,231
Ukiah, south of city, junction route 70	932	794	797	980
Ukiah, north of city, junction route 15 to Colusa	741	674	885	616
Willits, north of city, junction road to Ft. Bragg	355	342	370	268
Eureka, south of city limits	3,268	1,997	2,753	1,813
Arcata, north of city at junction route 20	1,806	1,051	1,222	893
Crescent City, junction of road	578	376	460	434
At Oregon line	43	37	70	63

Route 2. San Francisco to San Diego.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Colma, junction road to South San Francisco	15,626	6,365	18,497	8,767
San Bruno Junction Bay Shore Road	16,544	8,648	20,561	8,444
San Mateo, south of city at 16th Ave.	15,722	8,800	19,231	9,461
Redwood City, north of city limits	13,107	9,883	16,122	8,513
Palo Alto, at road to Federal Tel. Sta.	10,539	5,968	11,512	5,834
San Jose, north of city at lumber yard	14,250	18,905	16,289	17,159
San Jose, south of city limits	4,187	4,136	6,098	5,464
Gilroy, north of city, junction road to Watsonville	3,542	3,104	4,861	3,353
Salinas, south of city limits	1,513	1,551	1,995	1,701
Paso Robles, north of city limits	951	838	1,028	880
Paso Robles, south of city limits	1,458	1,197	1,631	1,229
San Luis Obispo, north of city limits	1,580	1,235	1,777	1,268
San Luis Obispo, south of city limits at railroad crossing	2,451	1,686	2,791	1,910
Santa Maria, north of city junction Route 57 to Bakersfield	1,658	996	1,671	1,178

Station				
Santa Barbara, west of city, junction San Marcos road	1,490	611	2,865	1,884
Santa Barbara, 300 feet east of city limits	4,448	2,995	5,836	4,928
Ventura, west of city at bridge	4,419	2,166	6,106	4,466
Ventura, west of city limits	5,288	3,442	5,208	3,710
Los Ageles, east at Indiana St.	19,469	17,103	21,462	19,330
Whittier, at junction with Hadley St.	9,365	7,069	13,001	9,687
Anaheim, north of city limits	9,966	7,393	11,315	8,362
Santa Ana, north of city at junction county road to Orange	8,767	6,177	8,976	6,659
San Juan Capistrano, north of city	3,731	2,061	3,392	1,955
Oceanside, near south city limits	4,701	2,872	4,701	3,147
Delmar, at Santa Fe Railroad crossing	4,401	2,988	4,086	2,409

Route 3. Sacramento to Oregon Line, via Marysville.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Sacramento, north at junction with Garden Highway	8,782	8,823	9,095	9,689
Marysville, south of city at junction Hamilton road	1,768	1,906	1,550	1,360
Yuba City, north of city at junction route 15	1,886	1,934	2,105	2,231
Chico, at junction county road to De Sabla	1,736	1,739	2,431	2,039
Chico, north of city, junction county road east	804	679	1,650	1,267
Red Bluff, at junction route 29 to Susanville	838	850	894	909
Redding, south of city, junction route 28 to Alturas	1,304	1,224	1,213	1,280
Dunsmuir, north of city limits at bridge	1,658	1,314	1,258	1,207
Yreka, south city limits	1,029	899	985	889
At Oregon line	508	307	462	356

Route 4. Sacramento to Los Angeles (Valley Route).

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Sacramento, south of city limits	4,845	4,429	6,164	5,725
Lodi, junction route 24 to San Andreas	2,444	2,146	2,724	2,058
Stockton, north of city, junction county road to Lockeford	4,194	3,952	5,097	4,007
Modesto, north of city	4,884	4,041	5,130	4,212
Modesto, south of city	4,256	3,869	5,208	4,974
Turlock, north of city	3,064	2,565	3,326	2,580
Turlock, south of city	3,038	2,346	2,523	1,991
Atwater, north of city	2,271	2,112	2,342	1,827
Merced, north of city at bridge	2,949	2,607	3,388	3,073
Merced, south of city at bridge	2,053	1,837	2,382	2,196
Fresno, south at maintenance yard	7,179	6,896	7,036	6,752
Kingsburg, south of city near Kings River bridge	2,092	1,667	2,172	1,665
Tulare, south city limits	2,187	1,981	2,350	2,078
Bakersfield, north of city, junction county road to Oil Center	5,252	4,441	5,297	4,923
Castaic, junction county road to Santa Paula	3,225	2,062	3,277	1,863
Saugus, juntion route 32 to Mojave	5,688	2,658	6,746	2,644
Newhall, end of section L. A.—4—E.	8,128	3,011	9,730	3,493

Route 5. Stockton to Santa Cruz via Oakland.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Tracy, west of city, junction county road to Byron	2,906	1,804	2,702	1,491
Livermore, east of city, junction county road to Livermore	1,524	1,147	1,786	1,123
Hayward, junction with Castro Valley road	2,682	2,031	1,418	1,104
Niles, junction Niles Canyon road	3,869	2,474	4,457	2,317
Nine miles north of San Jose, junction county road to Centerville	5,175	2,316	6,509	2,351
Five miles north of San Jose	6,082	3,043	8,330	3,662
San Jose, at north city limits	4,750	2,934	5,697	3,437
San Jose, west of city at sanitarium	5,864	7,686	6,722	6,180
Los Gates, northeast of city	1,934	1,794	3,267	1,929
Santa Cruz, north of city	1,319	893	2,168	897

Route 6. Sacramento to Woodland Junction.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
West of Sacramento, at underpass	3,755	2,697	4,114	3,008
Davis, east of city, at underpass	2,915	2,397	3,383	2,563

Route 7. Tehama Junction to Benicia.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Benicia, north of city	502	275	681	258
Fairfield, east of city	2,270	1,635	2,778	1,804
Dixon, south of city	1,007	1,389	2,354	1,484
Woodland, south of city	2,012	1,862	2,189	1,670
Williams, south of city	924	720	1,054	769
Willows, south of city	864	1,025	1,055	950
Orland, at junction route 47 to Chico	784	1,070	892	865
Red Bluff, south of city at Reed Creek bridge	856	803	795	964

Route 9. San Fernando to San Bernardino.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
San Fernando, 1 mile east	3,049	1,183	3,290	1,290
La Crescenta, west of Pennsylvania Ave.	6,759	3,841	6,354	2,945
Pasadena, east of city limits	12,493	6,723	11,174	6,714
Azusa, west of city limits	12,905	4,792	11,507	4,603
Upland, east of city at junction county road to Upland	4,748	1,483	4,331	1,717
San Bernardino, west of city	5,731	3,145	5,908	3,369

Route 10. San Lucas to Sequoia National Park.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
San Lucas, south of city at junction route 2	140	131	43	70
Coalinga, west of city	438	333	372	234
Hanford, west of city limits	1,277	1,547	1,379	1,432
Hanford, east of city, intersection county road to Kingsburg and south to Corcoran	1,851	1,796	2,182	2,087
Visalia, east of city at Exeter Junction	1,065	858	1,362	870

Route 11. Sacramento to Nevada Line via Placerville.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Sacramento, east of city limits	2,960	2,090	3,304	2,223
Folsom, west of city at junction with Pratts road	965	654	1,187	723
Placerville, west of city	932	724	1,318	536
Placerville, east of city	537	506	1,177	591
Between Riverton and Kyburz	50	15	112	22

Route 12. San Diego to El Centro.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
San Diego, east of city, Euclid Ave. at Cajon Ave.	5,791	3,923	2,519	2,370
El Cajon, west of city limits	6,011	2,896	5,249	3,330
Jacumba, at junction county road to El Campo	349	389	652	385
El Centro, west of city at junction route 26 to San Bernardino	2,560	2,504	1,744	1,774

Route 13. Salida to Sonora.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
East of Salida, at McHenry's Ave. to Modesto	1,036	744	1,229	827
Oakdale, west of city	1,123	931	1,417	909
Sonora, south of city	1,118	845	1,938	1,231
Sonora, east of city	741	645	1475	660

Route 14. Albany to Martinez.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Albany, at county line	13,254	11,149	17,748	11,402
Junction county road to Richmond	9,854	7,579	14,008	8,000
Junction Franklin Canyon road	3,533	2,331	5,607	2,763
Crockett, 1 mile south of city, junction county road to Crockett	948	1,184	1,606	1,182
Martinez, west of city limits	564	474	974	408

Route 15. From Route 1 Near Calpella to Grass Valley.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Ukiah, north at junction route 1	631	388	416	319
Mendocino and Lake County line	104	80	351	278
Near Venada, junction county road to Bartlett Springs	7	24	34	103
Williams, west of city	331	339	293	444
Williams, east of city	484	545	554	553
Colusa, east of city	611	811	788	778
Marysville, east of city	223	229	522	432
Grass Valley, west of city	147	161	311	196

Route 16. Hopland to Lakeport.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Hopland, at junction route 1	328	283	371	337
Lakeport, south of town	414	371	663	541

Route 17. Roseville to Nevada City.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Roseville, east of city	1,926	1,339	2,042	1,312
Auburn, south of city at S. P. R. R. crossing	1,374	1,075	1,725	1,309
Auburn, north of city at junction Country Club road	752	490	897	508
Grass Valley, south of city	660	499	771	421
Nevada City, south of city	852	878	1,074	843

Route 18. Merced to El Portal.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Merced, at intersection county road and 21st street	849	1,375	1,485	1,193
Merced, 12 miles east at junction county road to Le Grand	1,067	159	862	192
Mormon Bar, at junction county road to Mormon Bar	805	257	996	322
Briceburg, Bear Creek bridge	735	135	889	263

Route 19. From Route 9 West of Claremont to Riverside.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Between Pomona and Ontario, at Chino cross roads	6,972	2,889	12,023	6,551
Los Angeles County line, east limits of Pomona	12,788	6,364	12,337	6,510
Riverside, west of city near Santa Ana River bridge	6,609	4,495	7,373	5,226

Route 20. Route 1 Near Arcata to Redding.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Arcata, north of city at junction Rt. 1	675	441	848	423
Weaverville, 3 miles south	34	35	38	40
Between Redding and Tower House	60	93	136	176

Route 21. Route 3 Near Richvale to Quincy.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Oroville, east of city	458	443	576	457
Quincy	51	74	54	51

Route 22. San Juan Bautista to Route 32 via Hollister.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
San Juan Bautista, south of city at junction route 2	1,085	1,001	1,470	907
Hollister, junction route 32	479	296	708	303

Route 23. Saugus to Bishop.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Saugus, junction with route 4	4,069	1,252	5,157	1,513
Lancaster, junction with route 39 to Neenach	897	645	1,464	899
Freeman, 1 mile north, junction to route 57	117	94	130	93
Lone Pine	549	575	489	534
Bishop, half mile north junction county road north and county road easterly	426	376	302	321

Route 24. Route 4 Near Lodi to Valley Springs.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Lodi, junction route 4	1,012	1,005	1,363	1,103
Bet. San Andreas and Valley Springs	256	212	1,925	248

Route 25. Nevada City to Downieville.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Nevada City, north of city	77	83	102	148
Comptonville, north of city	44	50	54	73

Route 26. San Bernardino to El Centro.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
San Bernardino, S. of city at N. end of Santa Ana Br. county rd. to Colton	3,418	2,267	3,066	2,503
At intersection Mt. View Ave., west of Redlands	2,363	1,406	2,988	1,946
Beaumont, junction Jack Rabbit Trail	2,436	1,212	1,771	1,173
Coachella, south of city at junction county road to Thermal and Mecca	1,611	1,349	1,434	915
Westmorland at railroad crossing	1,584	1,499	2,023	1,715
Brawley Junction, southwest of city	2,979	2,482	2,843	2,641
El Centro, west of city, junction Rt. 12	4,495	4,123	4,306	3,985

Route 27. El Centro to Yuma.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
El Centro, east of city at junction county road north to Brawley and south to Calexico	2,065	2,333	2,484	3,131
East of Holtville	1,367	1,288	1,572	1,585
Sand Hills maintenance station	764	372	792	518
Yuma, at S. D. A. plant quarantine station	2,446	1,820	2,658	2,031

Route 28. Redding to Nevada Line via Alturas.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Redding, south of city at junction with route 3	429	508	445	479
Four miles east of Pittville at maintenance station	81	88	103	87
Canby	71	49	65	76
Twelve miles east of Alturas at maintenance station	46	60	43	39

Route 29. Red Bluff to Nevada Line via Susanville.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Red Bluff, east at junction route 3	200	207	261	269
Susanville, 1 mile west of town	256	142	314	186
Susanville, 1 mile east of town	883	539	743	503
Five miles south of Constantia	64	40	53	50

Route 31. San Bernardino to Jean.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
San Bernardino, north of city at junction Mt. Vernon and Highland Aves.	2,715	755	3,669	1,031
South of town limits of Victorville	1,065	648	1,084	635
Southwest town limits of Barstow	311	262	457	350
Nevada state line	60	68	96	94

Route 32. Route 2 Near Gilroy to Route 4 Near Califa.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Hollister, junction with route 22	493	330	802	374
Pacheco Pass at Merced-Santa Clara County line	637	274	973	371
East of Los Banos at junction county road to Dos Palos	400	275	447	376
Califa	524	325	1,068	439

Route 33. Paso Robles to Route 4 Near Bakersfield.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Paso Robles, east of city	949	841	1,005	914
Paso Robles, ½ mile east of city	482	458	618	488
Lost Hills, intersection of Main street	315	213	218	233

Route 34. From Route 4 Near Arno to Pine Grove.

Station	January, 1927 Sun. 16	January, 1927 Mon. 17	January, 1928 Sun. 15	January, 1928 Mon. 16
Twin Cities, junction route 4	284	216	304	282
West of Ione, junction county road to Michigan Bar	153	130	188	119
North of Jackson, junction route 65 to Placerville	459	434	634	461
Pine Grove, east of town	57	82	239	120

Route 37. Auburn to Nevada Line Near Verdi.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Auburn, east of city	704	562	1,370	1,155
Colfax, east of city, junction Nevada City road	121	125	392	200
Truckee, east of city, junction route 38 to Nevada	106	50	119	48

Route 43. San Bernardino to Big Bear Lake.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Foot of Waterman grade	842	144	966	350
Pinecrest, junction county road to Arrowhead Lake	251	13	175	30
Running Springs Park, junction City Creek road	55	18	57	No count
West end of bridge over Big Bear dam	14	7	58	18
One mile from end of route 43, junction county road to Pine Knot	75	25	89	30

Route 44. Boulder Creek to Redwood Park.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Boulder Creek at park line	264	353	373	239

Route 47. Orland to Chico.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Orland, junction with route 7	315	398	565	490
Chico, west of city	371	367	1,077	834
Hamilton City, at Union High School	446	459	376	179

Route 48. McDonalds to Wendling.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
McDonald, junction route 1	65	92	113	104
Wendling, 3 miles west of town	198	196	233	158

Route 49. Calistoga to Lower Lake.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
North of Calistoga at foot of grade	207	153	363	237
Lower Lake, junction Kelseyville and Lower Lake road	79	100	321	345
Middletown, junction Cobb Mtn. road	277	437	493	408

Route 51. Santa Rosa to Schellville.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Santa Rosa, east of city	2,212	1,680	2,461	1,762
Schellville, junction route 8	487	302	712	342

Route 52. Alto to Tiburon.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Belvedere, junction	663	575	1,439	862

Route 53. Fairfield to Lodi.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Denverton, at overhead crossing	208	177	345	152
Rio Vista bridge	779	869	996	895
Walnut Creek bridge	169	246	246	252
Thornton, intersection county road	642	650	755	558
Lodi, north of city	1,041	1,143	931	860

Route 55. San Francisco to Spring Valley Dam.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
At swimming pool	7,292	1,557	10,101	1,866
Junction with county road to Colma	3,696	777	7,182	977
Junction with county road to Belmont at earth dam	1,391	324	3,740	427

Route 57. Santa Maria to Freeman via Bakersfield.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Santa Maria, north of city at junction route 2	132	80	108	61
At San Luis Obispo-Kern County line	114	44	106	284
Maricopa, west of city	393	205	423	247
Bakersfield, 1 mile east of city limits	1,093	548	2,827	1,931
Bakersfield, 10 miles east at Country Club road	531	166	1,040	130
Bodfish, at intersection route 57 with county road to Caliente	96	76	77	75

Route 58. Mojave to Topoc.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Barstow, north of city at junction county road	189	198	207	209
Daggett, junction Arrowhead trail	146	129	285	267
Vicinity Amboy	79	72	128	148
Needles, west of city limits	127	108	416	206

Route 60. El Rio to San Juan Capistrano.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Santa Monica, 500 feet west of Santa Monica Canyon	11,792	3,900	10,035	2,940
Lomita	9,683	4,668	6,997	5,717
Seal Beach, at Los Angeles-Orange County line	12,743	8,048	10,182	5,714

Route 63. Big Pine to Oasis.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Big Pine, junction route 23	65	59		

Route 64. Mecca to Blythe.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Desert Center	93	83	97	85
Blythe, S. D. A. quarantine station	125	82	336	150

Route 65. Auburn to Sonora (Mother Lode Highway).

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Auburn to wire bridge	91	95	156	88
Placerville, northwest of city, junction Georgetown road	53	60	97	78
El Dorado, south of city	80	122	203	106
Central House	204	247	357	258
North of Jackson, junction route 34	593	661	748	630
South of San Andreas, at Sheep Camp	355	349	1,962	418
West of Sonora, junction county road south to Jamestown	73	111	219	135

Route 66. Manteca to Route 5 Near Mossdale School.

Mossdale, junction route 5	1,736	1,176	1,728	988

Route 68. San Francisco to Burlingame.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
San Bruno, junction with route 2 to San Francisco	5,005	3,589	5,866	3,372
North city limits of South San Francisco	5,000	4,113	6,292	4,603

Route 71. Crescent City to Oregon Line.

Station	January, 1927 Sun. 16	Mon. 17	January, 1928 Sun. 15	Mon. 16
Crescent City, N. of maintenance yard	575	502	526	480
At Oregon-California line	157	87	179	71

Route 8. Ignacio to Cordelia via Napa.

	1928		1927	
Petaluma Creek bridge	1,113	290	Not taken	
Schellville, junction route 51 to Santa Rosa	878	756	709	382
Napa, junction county road to Vallejo	3,675	1,608	2,515	1,565
Cordelia, junction route 7	2,742	1,433	2,066	1,285

PROGRESS REPORTS FROM THE FIELD

BUTTE COUNTY—A preliminary report of studies and investigations was completed the latter part of December, 1927, of practicable routes of a state highway location between Oroville and Quincy, District III, known as the Feather River Route. The report covers the investigations of three distinct routes and their several alternates, and are described as the North Fork Route, the Ridge Route and the Middle Fork Route. To facilitate final selection of an all-year interstate connection between Sacramento and Reno, there is being prepared, in connection with these studies, comparative profile and map of the routes.

DEL NORTE COUNTY—The contract for the grading and surfacing of a new roadway between the southerly Del Norte County line and the head of Richardson Creek, a distance of 3½ miles, is now under contract to J. E. Johnston of Stockton. During the past month he has been moving his equipment in on the job and has been clearing the right of way and constructing the culverts. A great deal of this work being in rock, it will probably be possible for the contractor to continue his work throughout the winter.

Along that portion of the state highway on the rock cliffs south of Crescent City, state forces have been widening the roadway and taking off some of the sharpest turns at the various points. This work is making a great improvement in the alignment and making it possible for the safer passage of the traffic over this dangerous piece of roadway.

During the last month a large slide occurred approximately six miles north of Patricks Creek. This slide was not caused by reason of the highway construction. It was merely a large slice of rock off the mountain side which slipped into the river, taking over 200 feet of the roadway with it. The roadway which slid out still exists intact about 50 feet below the grade and 50 feet out towards the river. The slide dammed up the river for a short while.

State maintenance forces quickly constructed a temporary roadway over the slide and now have a power shovel at work constructing a wider and more permanent road through it. Before this slide is removed, it will probably require from 35,000 to 50,000 cubic yards of excavation.

FRESNO COUNTY—Work on extending of all of the culverts on the Golden State Highway, through Fresno County, has been started. These culverts will be extended to the right of way line, thus eliminating the last of the narrow, dangerous places on this section of the highway.

GLENN COUNTY—One mile of bituminous macadam pavement with rock borders between Four Corners and Butte City, road III Gle-45A, was completed December 3, 1927. C. K. Buchanan was the contractor.

HUMBOLDT COUNTY—The Hauser contract and the Engelhart contract for grading and surfacing between Orick and the northerly county line, a distance of 15 miles, are practically at a standstill, due to the winter rains.

State forces under day labor work are making a great improvement in the alignment on the roadway just south of Orick, cutting off the sharpest turns and widening the roadway on fills, which will make this a much safer road in the future.

INYO COUNTY—The contract of F. C. Payton, Coso Junction to Olancha, 21 miles grading, will be completed March 1, 1928. On this section, surfacing by day labor of sandy portions is under way. Permission has been granted by the Railroad Commission to the Division of Highways for changing two crossings of Southern Pacific tracks at grade to the relocation.

Near the Black Springs, between Lone Pine and Cottonwood Creek, the timber bridge carrying the spillway flow from the aqueduct is, with the cooperation of the city of Los Angeles, being replaced by a 6-foot by 8-foot reinforced concrete culvert.

Plans and estimates submitted for advertising, for grading, surfacing and oiling, Alabama Gate to Diaz Lake, 8.5 miles.

Surveys completed for relocation, Olancha to Diaz Lake, 21 miles. Plans under way.

KERN COUNTY—Construction work on Route 10, Sierra-to-the-Sea Lateral west of Coalinga, is being started. The construction of several short-span bridges will take the road out of the creek bed and place it above danger of high water. Several changes in line are also proposed.

A gas shovel outfit and some tractors are starting work in the Kern River Canyon east of Bakersfield. This road will be widened and straightened to care for the increasingly heavy travel.

Contracts in Kern County, between Lerdo and Delano, consisting of 20-foot asphalt concrete widening and resurfacing, are rapidly nearing completion. The asphalt concrete work is all completed and contractors' forces are now engaged in finishing roadway slopes and placing rock borders.

Improvement of the new maintenance yard site in the city of Delano is now in progress. When improvements have been completed, it is expected to sell the old site and either move the present foreman's cottage to the new site or build a new one.

On the Bakersfield-Freeman Highway, Weldon to the Walker Pass, 20 miles widening and alignment improvements are in progress, with a day-labor force of four 60- and 30-horsepower tractors with 8-foot and 12-foot graders and rotary scrapers. Preparations are being made for extending this work, Walker Pass to Freeman Junction, Route 23, distance 11 miles. Surveys nearly completed. These improvements will greatly add to the convenience of travel over the San Joaquin and Owens Valley cutoff. Preparations are in progress for the installation of a maintenance yard at Mojave including truck and oil sheds.

LAKE COUNTY—Two survey parties are now on location between Upper Lake and Williams. One party, located at Upper Lake, has been in the field for the past two months and is working between Upper Lake and Sweet Hollow Summit. The other was recently established at Wilbur Springs and will be on location east toward Williams.

LOS ANGELES COUNTY—In preparation for the reconstruction of a portion of Foothill boulevard, between Monrovia and Azusa, a contract has been let and is now nearly completed for the moving back of buildings to clear the way for the new hundred-foot boulevard.

The Southern California Edison Company has already moved back its power line, and work has been commenced on the moving back of private irrigation lines.

Work is nearly completed on the laying of over 21 miles of pipe line along the coast highway from the Los Angeles city limits west of Santa Monica to Nicolas Creek on the Malibu Ranch. The pipe line will carry water to be used for highway construction and maintenance work on the section of highway through the ranch.

At various points along the coast highway westerly from Santa Monica, the maintenance crew with trucks

equipped with hoists, is placing hundreds of tons of heavy rip rap rock to protect the highway embankment from the ocean waves.

Between Mariposa and Briceburg, reconstruction of existing roadway is being performed by convict labor. An average population of eighty convicts is being maintained in camp and two power shovels are being operated, a gas and steam. The construction force is now located about 3½ miles north of Mariposa.

On the Yosemite lateral, the work of placing 6500 feet of standard laminated guard rail under contract is practically completed, the only remaining work being completion of painting.

MERCED COUNTY—The rock borders contract awarded to Larsen Bros. on the Pacheco Pass road from Los Banos to the easterly boundary is about 50 per cent complete. On this section, the Pacheco Pass route, approximately one mile east of the San Joaquin River, a multiple box culvert, consisting of six 10-foot spans was recently completed. This is for the purpose of by-passing flood waters which accumulate during the spring of each year and are prevented, with difficulty, from washing out the embankment and pavement.

Improvement of new maintenance yard site at Merced consisting of fencing, construction of warehouse, grading and graveling driveways, etc., is nearing completion.

MONO COUNTY—With the exception of installation of standard guard rail at dangerous points and maintenance patrol, there is no work under way in Mono County owing to below zero weather and periodical snow storms with attending cessation of travel. The snow fall on the "high Sierras" is much less than for many years past.

MONTEREY COUNTY—Work has been progressing steadily on the laying of a 20-foot concrete pavement from the northerly city limits of Salinas to the Santa Rita Junction, 1.9 miles north of the town. The pavement is being laid in half-sections, the east half having been completed and the west half started before the end of January.

Repair work is under way on the Carmel River bridge which is located on the highway to Big Sur just south of the town of Carmel. This work includes the reflooring of a considerable portion of the bridge.

ORANGE COUNTY—All concrete pavement has been completed and open to traffic on the 5.7-mile reconstruction job between Galivan and Irvine. Work is in progress on the rock borders along the new concrete pavement, with good progress being made.

The installation of pumps and a drainage system for the two new under-grade crossings of the Santa Fe Railroad tracks at Serra has been completed. Grading work is still in progress on the stretch of new highway which will connect the coast highway through Huntington Beach and Laguna with the Los Angeles to San Diego highway.

A special maintenance crew recently completed the construction of 2200 lineal feet of pipe and woven wire and brush bank protection work in the Santa Ana River, where flood waters threatened to cut away the approach to the highway bridge on the state highway between Anaheim and Santa Ana.

SAN LUIS OBISPO COUNTY—In connection with the program of curve betterment and minor line changes throughout San Luis Obispo County, a line change is being completed at a point about three miles north of San Luis Obispo, which will eliminate two of the sharper curves between San Luis Obispo and Cuesta Grade.

Work on the J. F. Knapp contract for reconstruction from Pismo to San Luis Obispo has thus far been confined principally to culvert work and grading, which work is nearly completed on the south half of the job. On the Ontario Hill (located where the highway first reaches the Pacific Ocean) a considerable slide developed near the summit of the hill, where a heavy layer of shale rock is found to lie on a mass of very hard rock the upper surface of which was coated with a thin layer of asphalt and dirt, making a naturally lubricated surface for the upper material to slide upon.

One of the most dangerous curves on the Cholame lateral, located at the east end of the Cholame Creek bridge at Shandon pumping station, is being greatly improved by superelevating the curve and placing warning lights.

Two old wooden bridges near San Simeon, on the road which extends from Cambria toward Carmel, are being replaced by more adequate structures.

SANTA BARBARA COUNTY—The paving of the new highway through Summerland and over Ortega hill has recently been completed as an extension to the Sam Hunter contract. This highway, which was graded along a new line two years ago, as described in the February, 1926, issue of CALIFORNIA HIGHWAYS, has now been paved with a Portland cement concrete pavement 30 feet wide, joining continuously with the similar pavement recently completed by Contractor Hunter, from Carpinteria to Summerland.

Contractor Collins is installing rock borders between Orcutt and Zaca on the coast highway in the northern part of Santa Barbara County. The shoulder installation commenced at Orcutt and is now completed for a distance of about 6 miles to the south thereof.

SACRAMENTO COUNTY—The paving on the reconstruction work between Sylvan school and Roseville has been completed. Grades and lines were improved, the roadway widened and a 20-foot asphaltic concrete pavement six inches thick was placed as a reconstruction job. Where the old grade was followed the pavement was widened and thickened to conform to the new work. Rock shoulders and two-feet by four-inch rock borders are also being constructed. This latter work is well under way and will complete the job.

SAN DIEGO COUNTY—San Diego County is reconstructing a portion of the state highway between East San Diego and La Mesa, under state inspection. The cost of the work is to be shared by the county and the state.

Several narrow cuts on the highway in the vicinity of Jacumba were recently widened by the maintenance crew working under a special allotment, in order to make the highway safer for children going to and from school.

VENTURA COUNTY—The construction of nearly 600 feet of bank protection in the Santa Clara River, to prevent the washing away of the approach to the state highway bridge near Montalvo, has been completed.

A special maintenance crew working along the coast highway near Point Mugu is quarrying and placing thousands of tons of heavy rip rap rock to prevent the washing away of the highway embankment by the ocean waves.

Reckless driving, speeding and driving while intoxicated constituted 82½ per cent of the offenses out of a total of 85,145 reported violations of the California Vehicle Act during 1927. The total number of these three offenses was 67,662 according to records of the State Motor Vehicle Division. Approximately 135,000 persons were fined, jailed or otherwise punished for motor vehicle violations during the year, the division estimates.

ROUGH GOING

STEP ON IT!

(An English auto racer in a specially designed sunbeam has recently hung up a world's record of 207 miles an hour. It took him four miles to stop his car. At the present rate of progress, may we hope for something like the following in 1975?):

"Mother, George and I are going out to a dance."

"All right, dear. Don't be late, will you?"

"No, Mother. The party's in San Francisco. We'll be back early."

(The Modern Girl of 1975 kisses her mother good-night and steps into her boy friend's 1200 horsepower runabout. He puts the car in low, and they thread through the traffic of lower New York at 40 miles an hour. Once in the country, George shifts to second speed and they ramble along at a comfortable 138 per.)

"Hadn't we better slow up, George? That sign back there said 'Danger: Sharp curve five miles ahead.'"

"That's all right, Joan. We have eight-wheel brakes. Well, here we are in Chicago!"

(He quickly adjusts the armor plate about his car, and they dash through the great city at 200 miles an hour, Joan manipulating the machine gun to ward off possible attacks.)

"Someone's trying to pass, George. He's been following us all through Iowa."

"Trying to pass, huh? Just let's see him do it!"

(With a whir of gears, George shifts into fifth speed and shoots ahead like a comet. The other car follows suit. Milestones whiz past in a confused blur as the Juggernauts skim over the countryside, wheels scarcely touching the road.)

"George! Look out! Here's a railroad crossing."

"Good gosh! The fool engineer! He's trying to beat me across."

(George jams on his brakes, but it is too late. There is a terrific smash. On the far side of the track, George finally comes to a stop and turns around. The wrecked Pacific Coast Flyer lies in a tangled mass across the rails, cars telescoped and splintered by the frightful impact. Beside the track, by the grim irony of fate, stands the warning signal which would have prevented this terrible accident: "Stop, Look and Listen; Look Out for the Automobiles!")—*Badger Highways.*

"Where are you going, my pretty maid?"
"I'm going a-courtin, sir," she said.
"For yesterday morning on my way to school,
I slipped and broke my traffic rule."

"There are four requisites to a good short story," explained the English teacher to the class. "Brevity, a reference to religion, some association with royalty and an illustration of modesty. Now, with these four things in mind, I will give you thirty minutes to write a story."

Ten minutes later the hand of Sandy went up.

"That is fine, Sandy," she complimented, "and now read your story to the class."

Sandy read: "'My Gawd,' said the countess, 'take your hand off my knee.'"

The News and Critic, Laconia, prints this regarding a roadside notice posted in New Hampshire:

"By order of the selectmen, cows grazing by the roadside or riding bicycles on the sidewalks is hereby forbidden."

An arm protruding from the car ahead means that the driver is:

1. Knocking ashes off a cigarette.
2. Going to turn to the left.
3. Telling a small boy to shut up, he won't buy any red pop.
4. Going to turn to the right.
5. Pointing out a scenic spot.
6. Going to back up.
7. Feeling for rain.
8. Saluting a passing motorist, or going to stop.

—*Hardware Age*

January Record of Bids and Awards

DIVISION OF HIGHWAYS

AMADOR COUNTY—Timber bridge across Dry Creek about 2.3 miles west of Ione. Dist. III, Rt. 34, Sec. A. Engineer's est. $7,896.70. Bids opened as follows: Holdener Construction Co., Sacramento, $8,854.71; M. B. McGowan, San Francisco, $12.517; M. A. Jenkins, Sacramento, $10,107. Contract awarded to Holdener Const. Co.

ORANGE COUNTY—Building reinforced concrete girder bridge, 40-foot roadway, across Aliso Creek about 8 miles north of San Juan Capistrano; and widening existing reinforced concrete bridge 2 miles south of Tustin, to 40-foot roadway, Dist. VII, Rt. 2, Sec. B-C. Engineer's est. $25,269.50. Bids opened Jan. 3d, as follows: A. R. Bishop, Long Beach, $23,747.50; Allen Brothers, Inc., Los Angeles, $24,-811.20; Warren & Warren, Los Angeles, $24,425.75; California Air Construction Co., Inc., Los Angeles, $23,442.80; Oberg Bros., Los Angeles, $27,002; R. L. Oakley, Palo Alto, $23,972; Paul M. White, Santa Monica, $21,971.30; R. Johnson, Glendale, $23,380; Ignace P. Lipp, Hollywood, $24,232. Contract awarded to Paul M. White, Santa Monica, $21,971.30.

SAN LUIS OBISPO COUNTY—Foreman's maintenance cottage. Dist. V, Rt. 33, Sec. B. Engineer's est. $3,150. Bids opened as follows: L. H. Carpenter of Paso Robles, $3,089; E. D. Jarvis, Atascadero, $3,575; James Jepson, San Luis Obispo, $3,892; Peter Sorensen, San Francisco, $3,283. Contract awarded to L. H. Carpenter.

DIVISION OF ARCHITECTURE

MENDOCINO STATE HOSPITAL—Tile roofing work. Bids opened Jan. 19th as follows: C. L. Frost, Monterey, $3,084; W. H. Saxby, Oakland, $3,100; R. E. Fraser & Co., Stockton, $3,191; W. J. Porter, San Jose, $3,298; Eckhardt & Ferrabee, Oakland, $3,325; Homer H. Sosso, San Francisco, $3,445; Malott & Peterson, San Francisco, $3,675. Contract awarded to C. L. Frost, Monterey, $3,084.

PACIFIC COLONY (Spadra)—Plumbing and heating work on employees' buildings and garages. Bids opened Jan. 24th as follows: Office estimate, $10,617; Jones Heating Co., Pasadena, $8,812; W. P. McArthur, Los Angeles, $9,508; Hickman Bros., Inc., San Pedro, $9,576; Latourrette-Fical Co., Sacramento, $9,816; Walter H. Smith, Long Beach, $9,950;

Thomas Haverty Co., Los Angeles, $11,467. Contract awarded to Jones Heating Co., Pasadena, $8,812.

For electrical work on employees' buildings and garages. Bids opened Jan. 24th as follows: Office estimate, $1,875. Moore Electrical Co., Los Angeles, $1,830; American Electrical Construction Co., Los Angeles, $1,879; R. R. Jones Electric Co., South Pasadena, $2,066; R. B. Winder, Covina, $2,079; Walter H. Smith, Long Beach, $2,385. Contract awarded to Moore Electric Co., $1,830.

For general work on employee's building and garages. Bids opened Jan. 24th as follows: Office estimate, $47,054. Campbell Construction Co., Ontario, $36,250; A. A. Laisy & Co., Los Angeles, $38,770; Gene B. Foster, Los Angeles, $39,611; Johnson Construction Co., Los Angeles, $39,690; Pozzo Construction Co., Los Angeles, $41,492; Wm. Rohrbacher, Santa Ana, $41,685; MacDonald & Driver, Los Angeles, $41,989; J. F. Kobler, Los Angeles, $41,989; Geo. Herz Co., San Bernardino, 42,100; V. Ray Gould, Los Angeles, $42,146; John Strona, Pomona, $42,250; Blue Ribbon Builders, Ontario, $42,808; John H. Kuhl, Jr., Beverly Hills, $42,962; Nance & Strauser, Sawtelle, $44,857; Louis A. Geisler, Huntington Park, $45,778; Fred F. Greenfield, Los Angeles, $45,918; Walter Slater Co., Los Angeles, $51,133; Witt & Chute, Los Angeles, $42,988. Contract awarded to Campbell Construction Co., Ontario, $36,250.

WATER PERMITS AND APPLICATIONS

Permits

Permits to appropriate water issued by the Department of Public Works, Division of Water Rights, during the month of January, 1928:

EL DORADO COUNTY—Permit 2950, Application 5659: issued to Carl W. Schmidt, Piedmont, January 16, 1928, for 0.001 c.f.s. from Celeste Creek in section 22, T. 12 N., R. 17 E., for domestic purposes in section 4. Estimated cost $150.

Permit 2946, Application 5682; issued to U. S. Forest Service, Placerville, January 12, 1928, for 0.005 c.f.s. from Alder Creek in section 35, T. 11 N., R. 14 E., for domestic purposes. Estimated cost $250.

LAKE COUNTY—Permit 2953, Application 4788; issued to Snow Mountain Water and Power Corporation, San Francisco, January 20, 1928, for 400 c.f.s. and 214,813 acre-feet per annum from South Eel River in section 14, T. 18 N., R. 10 W., for power purposes, 21681 t.h.p. to be developed. Estimated cost $3,200,000.

Permit 2954, Application 5661; issued to Snow Mountain Water and Power Corporation, San Francisco, January 20, 1928, for 4500 acre-feet per annum from South Eel River in section 14, T. 18 N., R. 10 W., for irrigation of 4905.9 acres within Potter Valley Irrigation District. Estimated cost $100,000.

LOS ANGELES COUNTY—Permit 2949, Application 5544; issued to Chas. A. Caldwell, Llano, January 16, 1928, for 0.007 c.f.s. from unnamed spring in section 25, T. 4 N., R. 9 W., S. B. M., for domestic purposes in section 24. Estimated cost $1,000.

Permit 2958, Application 5558; issued to Frank A. Hickman, San Dimas, January 30, 1928, for 0.12 c.f.s. from waste and seepage water from headwaters of Walnut Creek in section 2, T. 1 S., R. 9 W., for irrigation of 10 acres in section 2.

PLACER COUNTY—Permit 2955, Application 5413; issued to T. M. Navas, Auburn, January 21, 1928, for 0.19 c.f.s. from Buckeye Ravine in section 36, T. 12 N., R. 7 E., for domestic purposes and irrigation on 15 acres in section 36. Estimated cost $800.

RIVERSIDE COUNTY—Permit 2951, Application 5477; issued to U. S. Forest Service, San Bernardino, January 19, 1928, for 0.025 c.f.s. from unnamed spring in section 26, T. 4 S., R. 2 E., for domestic purposes in section 26. Estimated cost $500.

Permit 2952, Application 5758; issued to U. S. Forest Service, San Bernardino, January 19, 1928, for 0.016 c.f.s. from two unnamed springs in section 18, T. 5 S., R. 3 E., for domestic purposes in section 18. Estimated cost $1,600.

SAN BERNARDINO COUNTY—Permit 2945, Application 4483; issued to U. S. Forest Service, San Bernardino, January 12, 1928, for 0.11 c.f.s. from two unnamed springs and two wells in sections 29, 30, 19, T. 2 N., R. 3 W., for domestic purposes. Estimated cost $30,000.

Permit 2947, Application 5709; issued to H. P. Martin, Los Angeles, January 13, 1928, for 0.22 c.f.s. from a tunnel in section 28, T. 8 N., R. 18 E., for mining and domestic purposes near point of diversion. Estimated cost $500.

Permit 2948, Application 5436; issued to Isaac M. McAllister, Phelan, January 13, 1928, for 1.81 c.f.s. from Wild Horse Canyon in section 26, T. 4 N., R. 7 W., for irrigation and domestic purposes on 145 acres. Estimated cost $20,000.

SANTA CRUZ COUNTY—Permit 2944, Application 5689; issued to C. A. Doss, trustee for Bracken Brea Country Club, Oakland, January 11, 1928, for 0.025 c.f.s. from West Fork Sand Creek in section 24, T. 9 S., R. 3 W., M. D., for domestic purposes. Estimated cost $500.

SISKIYOU COUNTY—Permit 2956, Application 5476: issued to B. F. Whitton, Berkeley, January 21, 1928, for 1 c.f.s. from unnamed spring in section 15, T. 39 N., R. 8 W., for power purposes in section 15. 68 t.h.p. to be developed. Estimated cost $500.

TULARE COUNTY—Permit 2943, Application 5546; issued to R. Linder, Tulare, January 11, 1928, for 0.035 c.f.s. from Nelson Creek in section 28, T. 20 S., R. 31 E., for domestic purposes in section 33. Estimated cost $1,250.

TUOLUMNE COUNTY—Permit 2957, Application 5414; issued to Emma Rose and Hobart Estate Co., San Francisco, January 24, 1928, for 4656 acre-feet per annum from Highland Creek in section 9, T. 6 N., R. 18 E., for power purposes. 3294 t.h.p. to be developed.

Applications

Applications for permit to appropriate water filed with the State Department of Public Works, Division of Water Rights, during the month of January, 1928.

ALAMEDA COUNTY—Application 5811; The West Oakland Home, Oakland, for 0.3 c.f.s. from Crow Canyon Surface and underflow tributary to San Lorenzo Creek, to be diverted in section 25, T. 2 S., R. 2 W., M. D. M., for domestic and recreational purposes. Estimated cost $2,500.

CALAVERAS COUNTY—Application 5803; Pioneer Chief Gold Mines Co., San Andreas, for 0.625 c.f.s. from South Fork of Calaveras River tributary to Calaveras River, to be diverted in section 32, T. 4 N., R. 12 E., M. D. M., for mining purposes near point of diversion. Estimated cost $2,000.

DEL NORTE COUNTY—Application 5808; Wm. F. Cook and Frank Pitts, Crescent City, for 0.5 c.f.s. from unnamed spring tributary to Middle Fork of Smith River, to be diverted in section 28, T. 17 N., R. 2 E., H. M., for domestic purposes. Estimated cost $500.

FRESNO COUNTY—Application 5788; Miller & Lux, Inc., San Francisco, for 735 c.f.s. from San Joaquin River, to be diverted in section 19, T. 13 S., R. 15 E., M. D. M., for irrigation purposes on 58,796 acres. Estimated cost $294,000.

KERN COUNTY—Application 5797; Trona Railway Co., Trona, for 0.01 c.f.s. from Searles Tunnel, to be diverted in section 21, T. 28 S., R. 40 E., M. D. M., for industrial and domestic purposes. Estimated cost $11,269.

LAKE COUNTY—Application 5798; Mirabel Park Association, Oakland, for 3 c.f.s. from St Helena, Grizzly and Plymouth creeks tributary to Putah Creek, to be diverted in section 23, T. 10 N., R. 7 W., M. D. M., for mining purposes in section 23. Estimated cost $4,000.

Application 5799; Mirabel Park Association, Oakland, for 3 c.f.s. and 200 acre-feet from Bradford Creek tributary to Putah Creek, to be diverted in section 27, T. 10 N., R. 7 W., for power purposes in section 27. 10 t.h.p. to be developed. Estimated cost $15,000.

Application 5800; Mirabel Park Association, Oakland, for 0.20 c.f.s. and 200 acre-feet per annum from Bradford Creek tributary to Putah Creek, to be diverted in section 27, T. 10 N., R. 7 W., M. D. M., for domestic, irrigation and recreational purposes in sections 14 and 23 on 100 acres. Estimated cost $5,000.

LASSEN COUNTY—Application 5812; G. L. Kramer, Bieber, for 6.75 c.f.s. and 350 acre-feet from Widow Valley Creek tributary to Pit River, to be diverted in section 31, T. 39 N., R. 7 E., section 31, T. 38 N., R. 7 E., for irrigation purposes on 540 acres. Estimated cost $3,000.

LOS ANGELES COUNTY—Application 5802; Wm. E. Daly, Newhall, for 0.25 c.f.s. from unnamed spring in Canton Canyon tributary to Piru Creek, to be diverted in section 21, T. 6 N., R. 17 W., S. B. M., for domestic purposes at service station. Estimated cost $600.

Application 5813; Grand P. Ealy, Los Angeles, for 0.025 c.f.s. from springs at head of Breakneck Canyon, to be diverted in section 1, T. 2 N., R. 13 W., for domestic purposes.

Application 5805; Joseph Reynier, Newhall, for 0.25 c.f.s. from a spring known as Reynier Spring tributary to Santa Clara River, to be diverted in section 11, T. 3 N., R. 15 W., S. B. M., for domestic purposes. Estimated cost $2,500.

MADERA COUNTY—Application 5789; Miller & Lux, Inc., San Francisco, for 277 c.f.s. from San Joaquin River, to be diverted in section 22, T. 13 S., R. 16 E., M. D. M., for irrigation purposes on 22,170 acres. Estimated cost $75,000.

Application 5790; Miller & Lux, Inc., San Francisco, for 175 c.f.s. from San Joaquin River to be diverted in section 8, T. 13 S., R. 17 E., M. D. M., for irrigation purposes on 14,238 acres. Estimated cost $131,750.

MODOC COUNTY—Application 5792; Red River Lumber Co., Westwood, for 55 c.f.s. from Ash Creek tributary to Pit River, to be diverted in section 4, T. 38 N., R. 10 E., M. D. M., for power purposes in section 19, T. 39 N., R. 10 E. 3435 t.h.p. to be developed. Estimated cost $250,000.

Application 5804; A. R. Conklin, Alturas, for 0.625 c.f.s. from Dry Creek tributary to Parker Creek, to be diverted in section 2, T. 42 N., R. 14 E., M. D. M., for irrigation and domestic purposes on 72 acres.

Application 5795; John P. Booth, San Jose, for 30 c.f.s. and 5500 acre-feet per annum from Mill Creek and South Fork of Pit River tributary to Pit River, to be diverted in section 28, T. 40 N., R. 15 E., section 10, T. 39 N., R. 14 E., M. D. M., for power purposes. 1085 t.h.p. to be developed.

PLACER COUNTY—Application 5806; F. C. Bock, Loomis, for 0.62 c.f.s. from Antelope Creek tributary to Linda Creek, to be diverted in section 5, T. 11 N., R. 7 E., M. D. M., for irrigation and domestic purposes on 50 acres. Estimated cost $225.

SACRAMENTO COUNTY—Application 5801; T. Giraud, Rio Linda, for 0.19 c.f.s. from Dry Creek tributary to Sacramento River, to be diverted in section 33, T. 10 N., R. 5 E., for irrigation purposes on 15 acres.

SAN BERNARDINO COUNTY—Application 5791; U. S. Forest Service, San Bernardino, for 0.01 c.f.s. from unnamed spring tributary to Coldwater Creek and North Fork Lytle Creek, to be diverted in NW¼ NE¼ section 10, T. 2 N., R. 7 W., S. B. M., for domestic purposes on Pine Flats Resort Site. Estimated cost $200.

Application 5792; Horace M. Dobbins, Los Angeles, for 0.25 c.f.s. from an unnamed branch of Lone Pine Canyon tributary to Cajon Creek, to be diverted in section 10, T. 2 N., R. 6 W., S. B. M., for irrigation and domestic purposes on 90 acres. Estimated cost $2,000.

SAN DIEGO COUNTY—Application 5794; Chas. E. Ingraham, Buena Park, for 0.5 c.f.s. from two springs tributary to Mountain Springs, to be diverted in section 25, T. 9 S., R. 3 W., S. B. M., for domestic and irrigation purposes on 80 acres.

SAN JOAQUIN COUNTY—Application 5807; Woodbridge Irrigation District, Stockton, for 500 c.f.s. from Mokelumne River tributary to San Joaquin River to be diverted in section 34, T. 4 N., R. 6 E., M. D. M., for irrigation purposes on 35,000 acres. Estimated cost 325,000.

SAN LUIS OBISPO COUNTY—Application 5815; Marland Oil Co., Los Angeles, for 0.078 c.f.s. from Nacimiento River tributary to Salinas River, to be diverted in section 4, T. 25 S., R. 11 E., M. D. M., for mining purposes for boiler plant drilling for crude petroleum oil and domestic use. Estimated cost $3,200.

SHASTA COUNTY—Application 5796; Chas. F. Dougherty, Hazel Creek, for 0.019 c.f.s. from unnamed mineral spring tributary to Big Salt Creek, to be diverted in section 22, T. 35 N., R. 4 W., M. D. M., for medicinal, recreational and industrial purposes. Estimated cost $500.

SISKIYOU COUNTY—Application 5814; Herman Hageborn, Montague, for 2 c.f.s. from Trout Creek, to be diverted in section 32, T. 42 N., R. 1 E., for irrigation and domestic purposes on 100 acres. Estimated cost $150.

TRINITY COUNTY—Application 5810; Buckeye Placer Mines, Inc., Woodland, for 15 c.f.s. from Buckeye Creek tributary to Trinity River, to be diverted in section 24, T. 37 N., R. 8 W., M. D. M., for hydraulic mining purposes. Estimated cost $6,000.

VENTURA COUNTY—Application 5809; Otto G. Wilhelm, Los Angeles, for 0.5 c.f.s. from Santa Ana Creek tributary to Ventura River, to be diverted in section 7, T. 4 N., R. 23 W., S. B. M., for irrigation and domestic purposes on 170 acres. Estimated cost $38,000.

ROSTER
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STATE OF CALIFORNIA

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CALIFORNIA

1. Cuesta Grade, San Luis Obispo County.
2. Fifty-six-foot pavement on state highway near Tustin, Orange County.
3. Bridge across Crystal Dam, Skyline boulevard, San Mateo County.
4. State highway between San Juan and Hollister, San Benito County.
5. Pacheco Pass road near old Gilroy, Santa Clara County.
6. Shepards bridge, foot of Mountain Springs grade, Imperial County.
7. State highway near San Jose, Santa Clara County.
8. Pedestrian bridge over state highway, Coast road, north of Santa Monica, Los Angeles County.
9. State highway near Bear Canyon, Santa Cruz road, Santa Cruz County.
10. Rincon sea wall, Coast road, Ventura County.

HIGHWAYS