

DEPARTMENT OF THE INTERIOR

JOHN BARTON PAYNE, Secretary

UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, Director

WATER-SUPPLY PAPER 490-B

ROUTES TO DESERT WATERING PLACES IN THE
MOHAVE DESERT REGION, CALIFORNIA

BY

DAVID G. THOMPSON

Prepared in cooperation with the
Department of Engineering of the State of California



WASHINGTON
GOVERNMENT PRINTING OFFICE
1921

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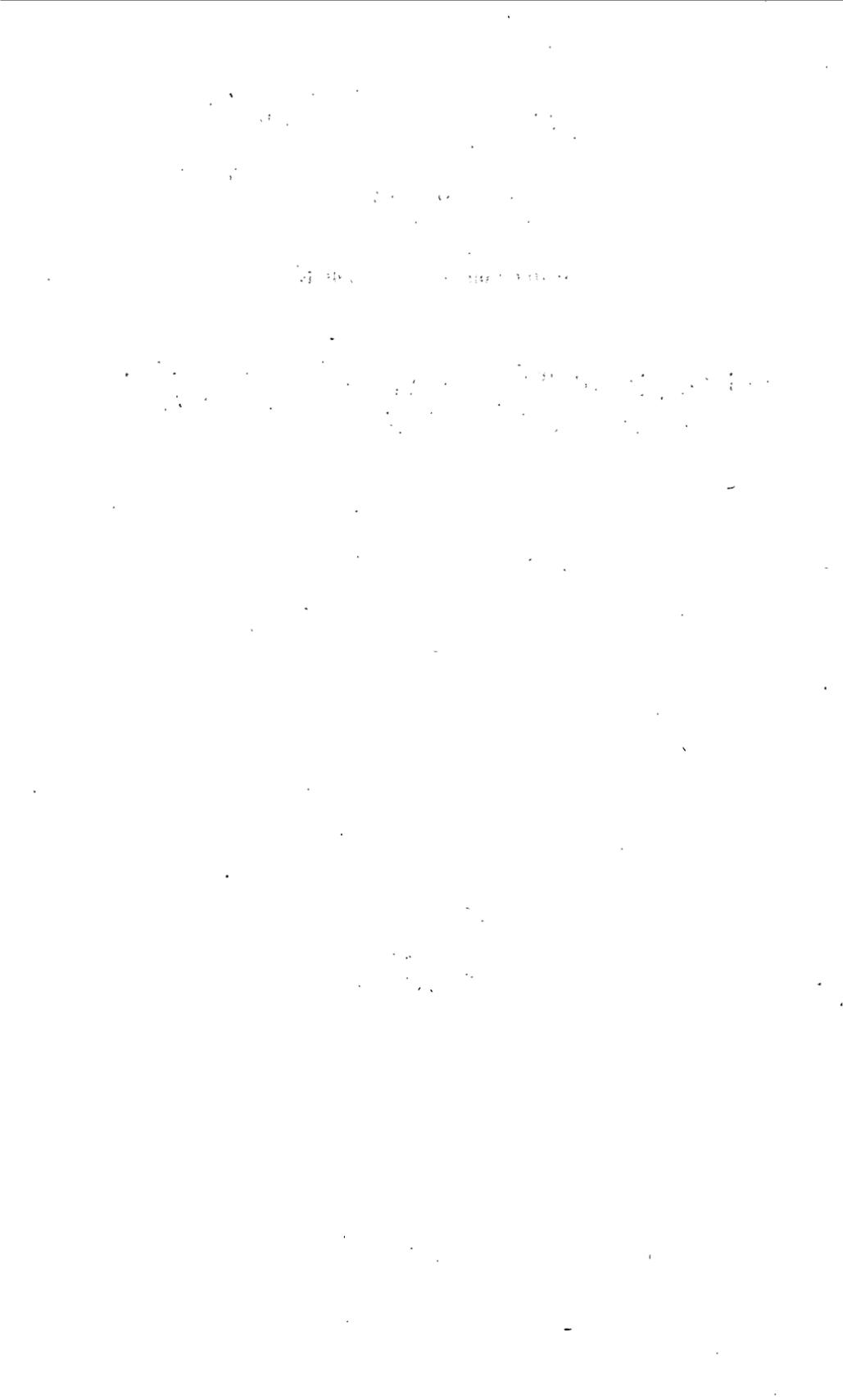
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1914-15

The first part of the year was spent in the field, collecting specimens and making notes on the habits of the various birds and mammals. The weather was generally favorable, though there were some periods of heavy rain and high winds. The birds were very active, and many nests were found. The mammals were also abundant, and several specimens were secured.

In the second part of the year, the specimens were prepared and the notes were written up. The birds were mounted and the mammals were skinned and preserved. The notes were arranged in chronological order and the specimens were labeled accordingly. The year was a very successful one, and many new specimens were added to the collection.

The following table gives a list of the specimens collected during the year, with their dates and the names of the collectors. The specimens are arranged in alphabetical order of the species names.

Species	Date	Collector
Alouatta palliata	Jan 15	J. S. Miller
Alouatta palliata	Jan 20	J. S. Miller
Alouatta palliata	Jan 25	J. S. Miller
Alouatta palliata	Jan 30	J. S. Miller
Alouatta palliata	Feb 5	J. S. Miller
Alouatta palliata	Feb 10	J. S. Miller
Alouatta palliata	Feb 15	J. S. Miller
Alouatta palliata	Feb 20	J. S. Miller
Alouatta palliata	Feb 25	J. S. Miller
Alouatta palliata	Feb 30	J. S. Miller
Alouatta palliata	Mar 5	J. S. Miller
Alouatta palliata	Mar 10	J. S. Miller
Alouatta palliata	Mar 15	J. S. Miller
Alouatta palliata	Mar 20	J. S. Miller
Alouatta palliata	Mar 25	J. S. Miller
Alouatta palliata	Mar 30	J. S. Miller
Alouatta palliata	Apr 5	J. S. Miller
Alouatta palliata	Apr 10	J. S. Miller
Alouatta palliata	Apr 15	J. S. Miller
Alouatta palliata	Apr 20	J. S. Miller
Alouatta palliata	Apr 25	J. S. Miller
Alouatta palliata	Apr 30	J. S. Miller
Alouatta palliata	May 5	J. S. Miller
Alouatta palliata	May 10	J. S. Miller
Alouatta palliata	May 15	J. S. Miller
Alouatta palliata	May 20	J. S. Miller
Alouatta palliata	May 25	J. S. Miller
Alouatta palliata	May 30	J. S. Miller
Alouatta palliata	Jun 5	J. S. Miller
Alouatta palliata	Jun 10	J. S. Miller
Alouatta palliata	Jun 15	J. S. Miller
Alouatta palliata	Jun 20	J. S. Miller
Alouatta palliata	Jun 25	J. S. Miller
Alouatta palliata	Jun 30	J. S. Miller
Alouatta palliata	Jul 5	J. S. Miller
Alouatta palliata	Jul 10	J. S. Miller
Alouatta palliata	Jul 15	J. S. Miller
Alouatta palliata	Jul 20	J. S. Miller
Alouatta palliata	Jul 25	J. S. Miller
Alouatta palliata	Jul 30	J. S. Miller
Alouatta palliata	Aug 5	J. S. Miller
Alouatta palliata	Aug 10	J. S. Miller
Alouatta palliata	Aug 15	J. S. Miller
Alouatta palliata	Aug 20	J. S. Miller
Alouatta palliata	Aug 25	J. S. Miller
Alouatta palliata	Aug 30	J. S. Miller
Alouatta palliata	Sep 5	J. S. Miller
Alouatta palliata	Sep 10	J. S. Miller
Alouatta palliata	Sep 15	J. S. Miller
Alouatta palliata	Sep 20	J. S. Miller
Alouatta palliata	Sep 25	J. S. Miller
Alouatta palliata	Sep 30	J. S. Miller
Alouatta palliata	Oct 5	J. S. Miller
Alouatta palliata	Oct 10	J. S. Miller
Alouatta palliata	Oct 15	J. S. Miller
Alouatta palliata	Oct 20	J. S. Miller
Alouatta palliata	Oct 25	J. S. Miller
Alouatta palliata	Oct 30	J. S. Miller
Alouatta palliata	Nov 5	J. S. Miller
Alouatta palliata	Nov 10	J. S. Miller
Alouatta palliata	Nov 15	J. S. Miller
Alouatta palliata	Nov 20	J. S. Miller
Alouatta palliata	Nov 25	J. S. Miller
Alouatta palliata	Nov 30	J. S. Miller
Alouatta palliata	Dec 5	J. S. Miller
Alouatta palliata	Dec 10	J. S. Miller
Alouatta palliata	Dec 15	J. S. Miller
Alouatta palliata	Dec 20	J. S. Miller
Alouatta palliata	Dec 25	J. S. Miller
Alouatta palliata	Dec 30	J. S. Miller

ROUTES TO DESERT WATERING PLACES IN CALIFORNIA AND ARIZONA.

PREFACE.

By O. E. MEINZER.

The desert region of the United States forms a great triangle whose base, 800 miles long, is the Mexican border from the Peninsular Mountains, in southern California, to the mouth of Pecos River, in Texas, and whose apex is in north-central Oregon. The west side of this huge desert triangle is the mountain wall formed by the Peninsular Mountains, the Sierra Nevada, and the Cascade Range; the east or northeast side is a less definite line extending from north-central Oregon, through Salt Lake City and Santa Fe, to the mouth of Pecos River. (See Pl. I.) It covers about 500,000 square miles, or very nearly one-sixth of the area of the United States.

This region is by no means devoid of natural resources or human activity. It contains prosperous cities, fertile agricultural districts, forest-clad mountains, a large aggregate number of watering places, many rich mines, and an unknown wealth of mineral deposits. But the localities that have water supplies are widely separated oases in a vast expanse of silent, changeless, unproductive desert whose most impressive feature is its great distances and whose chief evidences of human occupation are the long, long roads that lead from one watering place to another.

In the future existing oases will be enlarged, many new ones will be created, and the mineral and agricultural product of the region will be greatly increased. But in spite of all that man can do this large region will remain essentially a desert.

Travelers in this region must depend for their existence on the desert water holes (springs, wells, or natural tanks), many of which are separated from one another by a hard day's journey with team and wagon. For most of the region the water holes have never been accurately mapped or described, no systematic provision has been made for maintaining them, and the roads leading to them have not been marked with substantial and reliable signs. Hence, travel in the remote parts of the region has been a precarious and sometimes a dangerous undertaking.

The need of a systematic program for making the desert safe and accessible by mapping, marking, and improving its watering places has long been appreciated by public-spirited men who know its conditions. It has also been recognized that because of the great extent of the region and because most of it still belongs to the public domain the Federal Government can best do this work. For nearly 20 years Mr. George W. Parsons, of Los Angeles, has ardently advocated such a program.

Data on desert watering places were compiled some years ago by Gilbert E. Bailey, who was obliged to traverse repeatedly many of the main desert roads and trails, and these data were made available by him for use in a guide to watering places throughout a large desert area in California and Nevada published by the United States Geological Survey in 1909.¹

Considerable other work has been done by the United States Geological Survey in making maps of parts of the region and in publishing data on its water resources. (See Pl. I.) Signposts have been erected by States, counties, automobile associations, and other agencies, the Automobile Club of Southern California having been especially active in the southwestern part of the region. However, definite and precise information in regard to watering places, except those along the main roads, has not been available for most of the region, and most travelers in the desert have been obliged to grope their way through it by means of hearsay information.

A systematic program for the survey, marking, and protection of desert watering places was authorized by an act of Congress approved August 21, 1916, which reads as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior be, and he is hereby, authorized and empowered, in his discretion, in so far as the authorization made herein will permit, to discover, develop, protect, and render more accessible for the benefit of the general public springs, streams, and water holes on arid public lands of the United States; and in connection therewith to erect and maintain suitable and durable monuments and signboards at proper places and intervals along and near the accustomed lines of travel and over the general area of said desert lands, containing information and directions as to the location and nature of said springs, streams, and water holes, to the end that the same may be more readily traced and found by persons in search or need thereof; also to provide convenient and ready means, apparatus, and appliances by which water may be brought to the earth's surface at said water holes for the use of such persons; also to prepare and distribute suitable maps, reports, and general information relating to said springs, streams, and water holes and their specific location with reference to lines of travel.

An appropriation of \$10,000 became available for this purpose July 1, 1917. With this appropriation, supplemented with some other

¹ Mendenhall, W. C., Some desert watering places in southeastern California and southwestern Nevada: U. S. Geol. Survey Water-Supply Paper 224, 1909.



EXPLANATION

 Boundary of arid region requiring guides to watering places

 Area covered by guides to desert watering places. Published as Water-Supply Paper 490 and in four separate reports, namely, 490-A, 490-B, 490-C, and 490-D

 240
Area covered by water-supply paper
(The number is the serial number of the paper. Only principal water-supply papers are shown. A complete list of publications relating to water resources and information as to areas covered by topographic maps can be obtained by writing to the U. S. Geological Survey, Washington, D. C.)

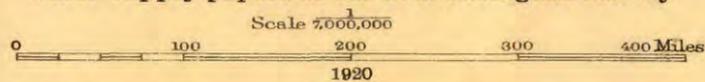
 Principal road

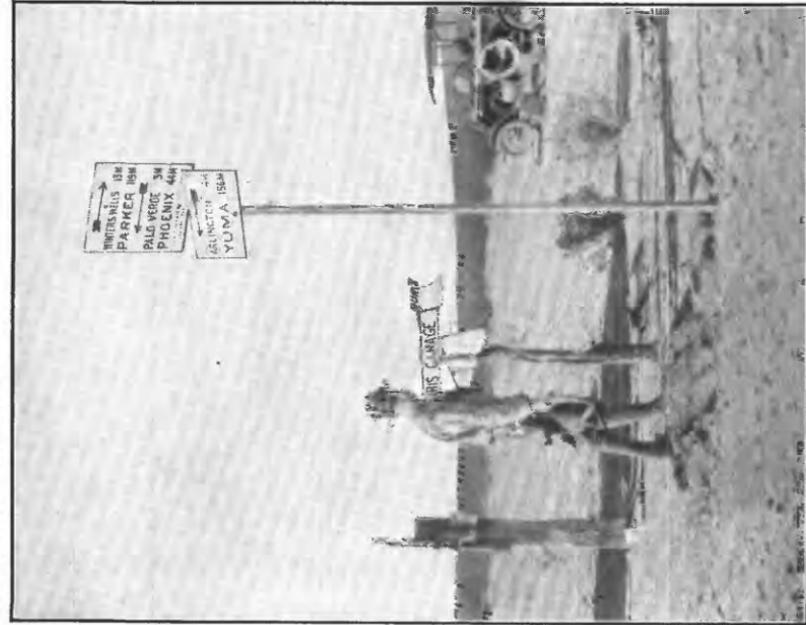
 Other important road

MAP OF THE ARID REGION OF THE UNITED STATES

Showing areas covered by guides to watering places and other water-supply papers of the U. S. Geological Survey

Compiled by O. E. Meinzer





4. FIRST DESERT WATERING PLACE SIGNPOST ERECTED BY THE UNITED STATES GEOLOGICAL SURVEY.

Photograph by C. P. Ross.



5. BAD ROAD TRAVERSED IN DESERT WATERING PLACE SURVEY.

Photograph by C. P. Ross.



TYPICAL DESERT WATERING PLACE SIGNPOST ERECTED BY THE UNITED STATES GEOLOGICAL SURVEY.

Photograph by D. G. Thompson.

funds that could be used for the purpose, a survey was made in 1917 and 1918 of the driest, hottest, and least explored part of the desert region, comprising 60,000 square miles in southeastern California and southwestern Arizona. (See Pl. I.) It includes the southern part of Death Valley and the region between this valley and the Mexican border in California, and the region west of Tucson and Phoenix and south of Wickenburg and Parker in Arizona. The field work was done by four parties, each consisting of one geologist and one nontechnical assistant, and each provided with an automobile and light camping equipment. The mapping was done with the plane table, on a scale of 1:125,000. Most of the watering places in the region were examined; about 200 samples of water were collected and shipped to the water-resources laboratory of the United States Geological Survey for analysis; and a general exploration was made of the region to determine its geography and geology and its ground-water conditions.

Signs directing travelers to water were erected at 167 localities in California and 138 in Arizona. (See Pls. II, A, and III.) The signposts are galvanized iron, 1.9 inches in outside diameter and 12 feet long. Each post is anchored to the ground with two redwood blocks. The signs are 18-gage steel, enameled, are white, with dark-blue letters, and are substantially bolted to the posts. They are of two sizes, 18 by 20 inches and 9 by 20 inches. Most of the larger signs, 470 of which were erected, give the names, distances, and directions to four watering places; most of the smaller signs, 165 of which were erected, give the names, distances, and directions to two watering places. Through the courtesy of the Board of Supervisors of San Bernardino County, Calif., signs were placed on 26 iron posts previously erected by the county.

The area covered is the part of the desert region where such work was most needed, not only because, on the whole, it has remained the least explored, but also because it is the hottest and most arid area and the one having the worst roads. (See Pl. II, B.) The work was, however, undertaken as a part of a larger plan, which contemplates—to the extent that funds are available—a similar survey and erection of signposts for the entire arid region, as outlined on Plate I. To make the work permanently effective it will be necessary from time to time to revise the maps and guides and to repair and supplement the signposts. The Federal Government is also under obligation to maintain the desert watering places that have been withdrawn from entry and are held as public water reserves.

Soon after the field work was completed three of the four geologists who made the survey entered the Army and the other one was assigned to work on water supplies for military establishments.

Consequently the preparation of the maps and guides to desert watering places had to be postponed until after the war. Reports are now being prepared which will give detailed information about the watering places in the region and will contain more comprehensive and accurate descriptions of its geography, geology, and hydrology than have hitherto been published. The four abbreviated guides comprising the present series (Water-Supply Paper 490) are published in advance of the complete reports for the use of those who do not need the more general information which the complete reports contain. These abbreviated guides consist essentially of the maps, the road logs (which constitute concise guides to watering places), and very brief descriptions of the watering places.



A. VIEW IN MOHAVE DESERT, CALIF.

The only water within 10 miles is a spring hidden under brush in this view.



B. NEAR VIEW OF THE HIDDEN SPRING IN THE AREA SHOWN IN A.

All photographs by D. G. Thompson.



C. UNITED STATES GEOLOGICAL SURVEY SIGNPOST DIRECTING TO THE SPRING SHOWN IN B.

The top sign reads "Indian Spring 2/10 M. Fifty feet north of road in wash."

ROUTES TO DESERT WATERING PLACES IN THE MOHAVE DESERT REGION, CALIFORNIA.

By **DAVID G. THOMPSON.**

INTRODUCTION.

SCOPE OF REPORT.

The present report consists principally of logs of the usual routes of travel in the desert part of San Bernardino County, Calif., and adjoining parts of Los Angeles and Kern counties. These logs give the distances between towns, watering places, and easily recognized points on the roads. They also contain brief statements in regard to points where supplies can be obtained, choice of routes, character of roads, and the quality of water of most of the springs and wells as shown by analyses. The list of watering places at the end is an index of those mentioned in the road logs and includes also brief notes on the watering places shown on the maps that are not near any of the roads described in the logs. A few suggestions in regard to desert travel are given for the benefit of those entering the region for the first time. The detailed maps (Pls. IX, X, XI, XII, and XIII, in pocket) are considered to be one of the most valuable parts of the report. The relative position of the areas shown on the different maps is indicated on the index map, Plate VIII.

LOCATION AND EXTENT OF AREA.

The area covered by this report includes all of the desert portion of San Bernardino, Los Angeles, and Kern counties, a narrow strip across the north side of Riverside County, and a somewhat wider strip of the southern part of Inyo County. A part of Clark County, Nev., is shown on the maps, but very little information is included about that region. In addition, nearly all of the better-watered part of San Bernardino County and small portions of Riverside and Los Angeles counties south of the San Bernardino and San Gabriel mountains are shown on the map. This region south of the mountains, which forms part of the famous citrus belt of southern California, has many paved roads well marked by signposts, and no data are given concerning it. Only important roads in this thickly settled region are shown on the map (Pl. X).

The total area represented by the maps is nearly 30,000 square miles, of which more than 25,000 square miles may be considered as strictly desert country. Because of the large area to be covered it was not possible to travel every road and visit every spring, but detailed logs of all the important routes were made, all the better-known watering places were visited, and water samples were collected from most of them and later analyzed in the laboratory of the Geological Survey.

Certain portions of the area were not visited. The largest of these portions is a nearly square area bounded approximately by meridians $117^{\circ} 30'$ and $118^{\circ} 00'$ and parallels $34^{\circ} 30'$ to $35^{\circ} 00'$. A trip was made completely around this area, but none of the roads passing through it were traveled. Many homesteaders have taken up land in the southern part of it, and that part is crossed by a number of roads, mostly along section lines.

SOURCES OF INFORMATION.

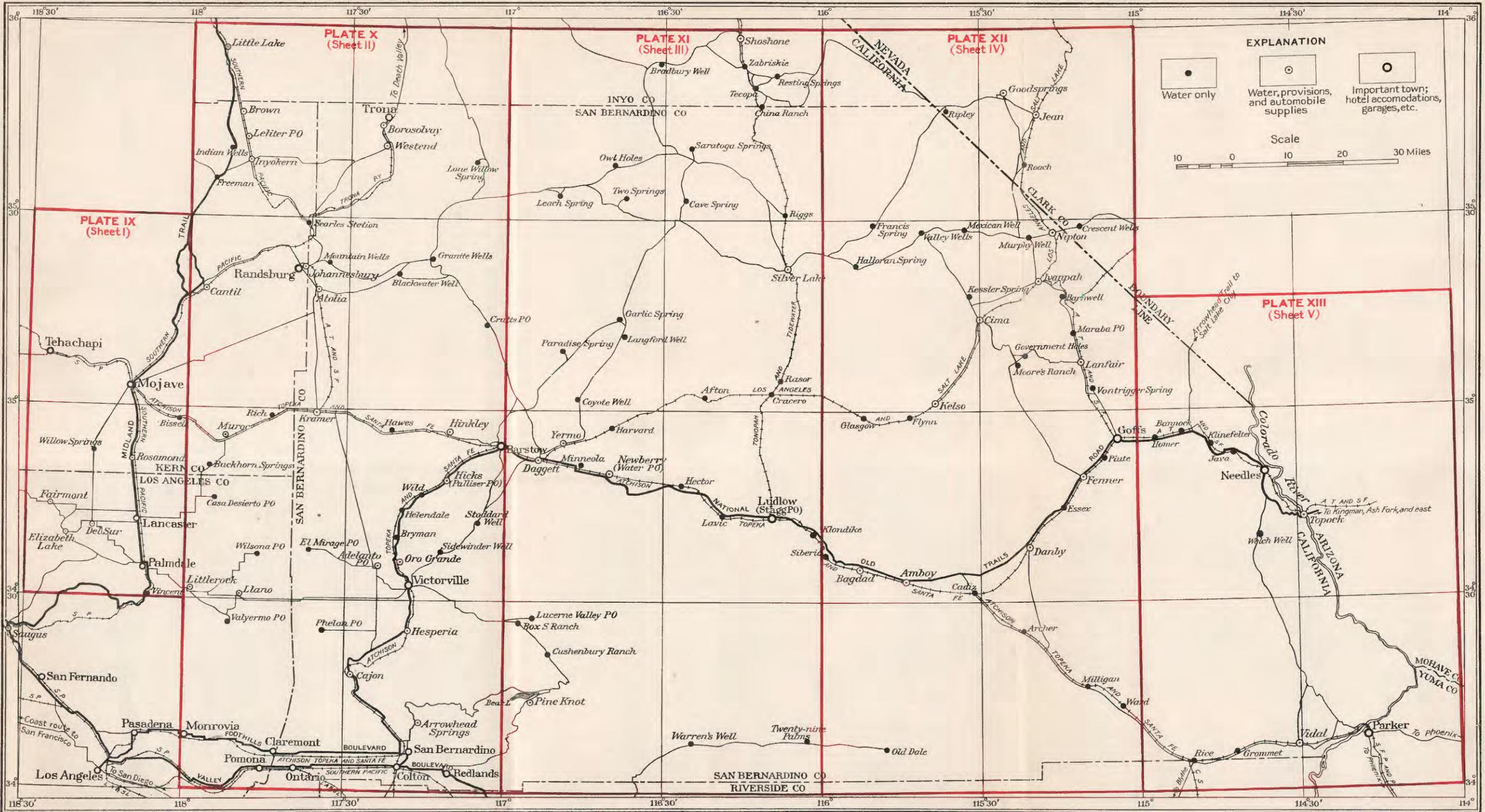
The greater part of the information presented in this report was collected in the field by the writer during the months from September 1, 1917, to March 1, 1918. Additional information was collected in the field from October 20, 1919, to February 1, 1920, in connection with a detailed study of ground-water conditions in certain parts of the region. The data on a small area at the south end of the region mapped on Plates XI and XII, from The Pipes and Warren's ranch eastward to Dale, were collected by John S. Brown, and the notes on that area have been prepared by him.

As reliable information as possible regarding roads that were not traveled and watering places that could not be visited was procured by inquiry from prospectors, homesteaders, and others, and it has been the policy in writing this report to distinguish between information that is first hand or known to be reliable and that which was obtained from others and hence is largely hearsay. The maps have been corrected, as far as possible, up to April 1, 1920, so that important changes in roads that are known to have taken place since the field work was done are incorporated in them.

THE MAPS.

The detailed maps (Pls. IX, X, XI, XII, and XIII, in pocket) have been compiled from many sources. Topographic maps published by the United States Geological Survey were used so far as they were available, necessary changes and additions in roads being made.² In areas for which such maps did not exist the principal

² An index map showing parts of the area covered by this report for which topographic maps have been published may be obtained free from the Director, U. S. Geological Survey, Washington, D. C.



INDEX MAP OF THE MOHAVE DESERT REGION, CALIFORNIA
 SHOWING AREAS COVERED BY PLATES IX-XIII

ENGRAVED AND PRINTED BY THE U.S. GEOLOGICAL SURVEY

roads were mapped in the field. A plane table was used, and locations were made either by triangulation or by a compass traverse. The traverse was tied at short intervals to definitely located points.

For parts of the region that were not visited several sources of information have been used in the compilation of the base map, such as maps prepared by the Automobile Club of Southern California, the county surveyors of San Bernardino County and Los Angeles County, the California Highway Commission, and the California State Mining Bureau, and maps accompanying published and unpublished reports of the United States Geological Survey. The relief shading of the maps is the work of J. H. Renshawe, of the Survey, and the data for it were obtained from many sources. Different depths of shading have been used to indicate the relative altitude of different parts of the area, the degree of shading being the same in two separated regions lying at the same altitude. The details of topography and the accuracy of the relief shading necessarily vary from one part of the map to another, according to the information available. In regions that are covered by topographic maps the topography is shown in sufficient detail to permit the identification of many comparatively insignificant features. The mapping of the northeastern part of the area shown on Plate XI, including about half a degree of latitude and longitude, is based on an incomplete topographic field sheet and is comparable in accuracy to that of the parts of the area covered by published topographic maps. The topography for several miles on either side of the main line of the Atchison, Topeka & Santa Fe Railway is based on topographic maps published in a bulletin of the Geological Survey.³ In parts of the area that were mapped in the field an attempt was made to indicate accurately the border of the mountains and the location of the divides and to show the most prominent embayments, the mountain passes that are crossed by roads, and other features that should aid the traveler in locating himself. Because of the necessary haste these features could not be mapped in as great detail nor as accurately as they would be shown on the topographic maps.

The relief shown for the region that was not entered by the writer is least accurate and detailed. It has been based on several sources of varying degrees of reliability. For some parts of this region the data were obtained from maps of the United States Geographical Survey West of the One Hundredth Meridian, published between 1875 and 1880. For other parts recent township plats of the General Land Office give a fair idea of the relief, but for still other parts only the

³ Darton, N. H., and others, *Guidebook of the western United States, Part C, The Santa Fe Route*: U. S. Geol. Survey Bull. 613, 1916.

old township plats were available, and these indicate only the mountain boundaries, and some of them not even that much. The part of Plate XI showing the region around Crucero and Cronise Valley was taken largely from a map prepared by H. D. Bradley, of Riverside, Calif., which is the most accurate map of that region the writer has seen. Altitudes have been obtained from railroad profiles and from barometric readings from a number of sources.

In the compilation of the maps the relative value of data from different sources was carefully compared, with a view of determining what was most accurate. It is realized that the maps contain errors, but it is believed that they are the best available for the region at the present time. Previously published maps have been very much more generalized, both as to the course of the roads and as to the character of the physical features. On the present maps the noticeable changes of road direction are usually indicated, and the relation of the roads to mountain features is shown as correctly as possible. Most of the maps of the area that have been published recently by private companies or official organizations have been compiled, in part at least, from older maps, and certain errors existing on the older maps have persisted in the newer ones. A number of these inaccuracies have been corrected in the maps accompanying the present report.

Township lines are shown upon the maps, but they are not necessarily located correctly with respect to springs, railroad stations, and other definite geographic points, because very few land corners were found that would permit the land net to be properly tied to points shown on the base map. Most of the townships were surveyed more than 60 years ago. Recent resurveys by the General Land Office in certain parts of the area show that in places great differences exist between the supposed location and the true location of township lines. In one locality, for instance, north of Goffs (Pls. XII and XIII), original township corners have been found almost 3 miles from the points where they were supposed to be. There is reason to believe that great errors exist in other parts of the area. The township lines were indicated on the map principally for convenience in giving the approximate location of springs, wells, etc., in the descriptions of watering places.

ACKNOWLEDGMENTS.

The present report contains data that have been gathered from many sources, and it is obviously impossible to mention individually everyone who has given information. The writer desires to express his obligations to the many postmasters, merchants, mine officials, ranchers, and prospectors who have given data of one sort or another. He is especially indebted to Mrs. A. Gilham, postmistress

at Barstow, and to the late Mr. E. T. Hillis, of the same town, and their associates, for many favors and aid in various ways.

The officials of the railroads that pass through the area—the Atchison, Topeka & Santa Fe, the Southern Pacific, the Los Angeles & Salt Lake, and the Tonopah & Tidewater—gave valuable information about sources of water supply along their lines and data in regard to alignments and elevations at many points. The county surveyors of San Bernardino and Los Angeles counties cooperated in bringing the map of that part of the area south of the San Bernardino and San Gabriel mountains up to date. The writer is under obligation to the officials of the Automobile Club of Southern California for cooperation in many ways, particularly for permission to use data from their copyrighted maps for parts of the area where field work was not done.

The work was done under the direction of O. E. Meinzer, chief of the division of ground waters of the United States Geological Survey, and he and the other members of that division have given many helpful suggestions. A number of other members of the Geological Survey have furnished data that have enabled the maps to be made more accurate. L. F. Noble made a compass traverse of the road from Saratoga Springs to Shoshone, by way of Death Valley, and furnished information in regard to watering places on that route, as well as in regard to other parts of the desert with which he is familiar. W. C. Cauthen and C. H. Conoway acted as field assistants at different times and with their knowledge of automobiles helped the party out of difficulties that arose in the course of travel of several thousand miles over desert roads.

GENERAL DESCRIPTION OF THE REGION.

Only a brief description of the general features of the region will be given here. A somewhat detailed description of the geography, geology, and hydrology of the Mohave Desert region will be given in a later report.

NAME.

The region that is covered by this report is generally called the Mohave Desert. That name, however, has not always been used to designate the same territory. By some authors it has been applied to an area that is bounded approximately on the east by Mohave River between Barstow and Cajon Pass, on the north by mountains that lie north of the Atchison, Topeka & Santa Fe Railway between Barstow and the town of Mojave,⁴ and on the south and west by the

⁴ By a decision of the United States Geographic Board the Indian name applied to the desert and river in San Bernardino County is spelled Mohave. The name of the post office in Kern County is spelled Mojave.

San Gabriel and Tehachapi mountains and the Sierra Nevada. By other authors the Mohave Desert has been considered as covering a much larger territory, extending as far north as the Quail and Owl-head mountains and the south end of Death Valley and as far east as Colorado River. One author has applied the name to an even more extensive region. The name has been used by all authors more or less vaguely to designate a physiographic province, but its value has suffered by the variation in popular use, and there is doubt as to whether it should be any longer considered as having any physiographic or geologic significance. It is not necessary to discuss in this place appropriate names to describe the large physiographic features of the region, as this question will be taken up in a later report. It is desirable, however, to have a term by which the entire desert region covered by this report can be designated. For convenience, therefore, the term "Mohave Desert region" will be used as applying to the entire region shown on the large maps (Pls. IX, X, XI, XII, and XIII) except the settled region south of the San Gabriel and San Bernardino mountains. The term is used only in a general locational sense, like such names as "southern California" and "the Southwest." Certain small areas may thus be included that have not previously been considered as being strictly part of the Mohave Desert—as, for instance, the southern part of Death Valley and part of California that is drained by Colorado River.

PHYSIOGRAPHY.

The greater part of the Mohave Desert region has generally been regarded as a part of the Great Basin. In a report by a committee of the Association of American Geographers, however, most of the area here mapped is assigned to the Basin and Range Province, which is more extensive than the Great Basin as previously interpreted more or less indefinitely by various authors. Whether or not the region is considered a part of this physiographic province, it is characterized by basins that have no external outlet and are separated by higher areas ranging from hills to mountains.

The region, except for a small strip along the east side that is tributary to Colorado River, is one of interior drainage—that is, it contains no streams that reach the ocean or that join other streams that reach the ocean, the run-off from rainfall being carried to the bottoms of numerous closed basins, where any excess over that which sinks into the ground is disposed of by evaporation. It is separated on the southwest and west from regions that drain to the Pacific Ocean by high mountains—the San Bernardino, San Gabriel, and Tehachapi ranges and the Sierra Nevada—which act as effectual barriers to travel, the adjoining region being accessible only through

four or five passes that are many miles apart. On the north the desert, with interior drainage, continues with slight variations far beyond the Mohave Desert region. On the east a strip with a maximum width of about 50 miles is tributary to Colorado River, but in this strip the conditions are essentially similar to those in the rest of the region except that there are no closed basins. East of longitude $116^{\circ} 30'$ the conditions of interior drainage extend southward for a considerable distance beyond the Mohave Desert region.

The region contains many large areas of unconsolidated sand, gravel, and clay washed down from the mountain slopes, each generally separated from other areas of similar character by rugged mountains. The bottoms of the closed basins into which this material is washed are usually occupied by one or more playas, or "dry lakes," as they are commonly called. The large maps in this report show more than 50 playas, ranging in diameter from half a mile to 10 miles or more.

In each of the typical desert basins three prominent parts may be recognized—the playa, the alluvial slope, and the mountain. The playa, or "dry lake," which occupies the bottom of the basin, is a nearly flat-surfaced deposit of clay or silt. In dry weather the surface of many of the playas is hard and smooth (see Pl. XV, *B*), but in very wet weather it may become soft and muddy. In other playas the surface is always soft and mushy and is frequently covered with alkali. From the playa the land rises gradually toward the mountains that inclose the basin, becoming steeper as the foot of the mountains is approached. The part of the basin between the playa and the mountain is characteristically composed of alluvial material—sand and gravel—which near the foot of the mountains is coarse, in places containing huge boulders, and which increases in fineness toward the bottom of the basin. From the upper limit of the alluvial slope the mountains rise very steeply, and their sides are generally rough and rocky. The change from the distinctly alluvial slope to the mountain slope may occur within a few hundred feet.

The Mohave Desert region lacks large, permanent streams; in fact, it contains practically no permanent streams except a few in the highest mountains. The mountains are dissected by steep-sided canyons that usually contain streams only after heavy rains. As the streams emerge from the canyons onto the alluvial slope the water sinks into the porous gravel that forms the slope, and a short distance from the mountains there are to be seen only dry, sandy, or gravelly channels (washes), which have been formed by the streams during the very heaviest rains. It is very seldom that water runs on the surface from the mountains to the playa in the lowest part of a basin, but after a heavy storm water may accumulate in the center

of the basin, forming a "playa lake." When this disappears by evaporation or absorption it leaves a fine layer of mud or clay.

Only two streams of any considerable size exist in the Mohave Desert region, and both of these are dry for much of their length during the greater part of the average year. Mohave River rises in the San Bernardino Mountains, in the south-central part of the region, and takes a northerly course to Barstow and thence north-easterly along the line of the Los Angeles & Salt Lake Railroad. Near Baxter station the river emerges from a canyon and spreads out over a large alluvial fan. Some of the flood waters, as they emerge from the canyon run northward to Cronise Lake (a playa), and some continue eastward to the playa of Soda Lake, frequently called "the sink of the Mohave." The water that collects on these playas disappears by evaporation or by sinking slowly into the soil. In extreme floods some of the water may flow from Soda Lake into Silver Lake. In the San Bernardino Mountains Mohave River and its several branches are permanent streams, but as the river emerges onto the alluvial slope north of the mountains its waters are quickly absorbed by the gravel and disappear from view. It reappears a few miles south of Victorville and continues at the surface as a sluggish, shallow stream as far north as Oro Grande, where it disappears again because of the porous nature of the river bed. Between Oro Grande and Soda Lake small streams flow in the channel for short distances at several places where local features, such as buried rock ledges or impervious clay beds, cause the water table to rise to the surface. In winter, when the evaporation is less, the water will flow farther at the surface than in summer, and pools of water will stand in many places that in summer are bone-dry. After very heavy rains the usually dry channel is filled from bank to bank with a roaring, muddy torrent.

The only other stream of any importance in this region is the Amargosa (Spanish for "bitter;" sometimes mispronounced as if it were spelled "armagosa"). This river rises near latitude 37° and longitude $116^{\circ} 45'$, nearly 100 miles north of the northwest edge of the area shown on Plate XI, and flows southeastward through a valley that lies east of Death Valley, from which it is separated by high mountains. Near latitude $35^{\circ} 45'$ the river bends west and then northwest, and it enters the south end of Death Valley near Saratoga Springs. (See Pl. XI.) The Amargosa is even less a true river than the Mohave, for so far as is shown on the topographic map there is for part of its course not even a distinct channel. It is usually dry for most of its length, although there are some parts of it which always contain water, or at least in which water exists within a few inches of the surface.

GEOLOGY.

Comparatively little geologic work has been done in the Mohave Desert region. The principal published reports describing the geology of the region have been of a reconnaissance nature or have described only a few very small areas, and for a large part of it practically nothing is known about the rocks or their structure.

The following are some of the principal reports describing the geology of parts of the region. The reader who is interested may obtain additional references from them:

- BAKER, C. L., Notes on the later Cenzoic history of the Mohave Desert region in southeastern California: California Univ. Dept. Geology Bull., vol. 6, No. 15, pp. 333-383, December 2, 1911. This report treats principally of the southwestern part of the region. It contains a bibliography of other papers.
- DARTON, N. H., and others, Guidebook of the western United States, Part C, The Santa Fe Route; U. S. Geol. Survey Bull. 613, pp. 143-169, 1916. This book describes the geology of the region lying along the Atchison, Topeka & Santa Fe Railway from Colorado River to San Bernardino.
- SPURR, J. E., Descriptive geology of Nevada south of the fortieth parallel and adjacent portions of California: U. S. Geol. Survey Bull. 208, 1903. This paper describes the part of the region north of latitude $115^{\circ} 30'$.
- SMITH, J. P., The geologic formations of California: California State Min. Bur. Bull. 86, 1916. This bulletin is of value principally for the geologic map that accompanies it. The map shows fairly accurately the general distribution of geologic formations in the desert region, but locally the details are very inaccurate, the principal errors being that Quaternary alluvium is shown in several areas where there are large mountains composed of rocks of Tertiary age or older. The map is not to be depended on so far as the roads and watering places in the desert are concerned. In view of the meagerness of the data from which the map was compiled, its accuracy is as great as could be expected.

The following very brief summary will serve to outline the geology of the region.

Pre-Cambrian: Granite, schist, and gneiss occurring in parts of the region have been assigned to the pre-Cambrian. Some of the schist or gneiss may possibly be of Paleozoic age, and some of the granite may be Mesozoic.

Paleozoic: Sedimentary rocks of Paleozoic age, including sandstone, limestone, and slate, have been found at several localities, principally in the eastern and northeastern parts of the region. Most of them have been assigned to the Cambrian or the Carboniferous. Comparatively few fossils have been found, and many of these have been so poorly preserved that they give slight clue to the age of the rocks. It is believed that as the region is studied in greater detail more sedimentary rocks will be found than are now known, and their position in the geologic column will be more accurately determined.

Mesozoic: The Mesozoic era is represented in this region principally by granitic rocks. Many of the mountain ranges of the

region are composed of granite, but it is not everywhere possible to determine whether the granite is of pre-Cambrian or Mesozoic age. A very small area of sedimentary rocks in the extreme northeastern part of the region has been considered Mesozoic.

Cenozoic: The Cenozoic rocks cover a large part of the Mohave Desert region.

The Tertiary rocks are widely distributed; they consist principally of a series of volcanic rocks (rhyolite, latite, basalt, tuff, and volcanic ash), interbedded in places with sandstone, limestone, and shale. They are in many places brilliantly colored, green, reddish brown, and purple being the most common hues seen.

The Quaternary deposits are principally unconsolidated alluvial sand, gravel, and clay derived from the mountains, and they cover a very large part of the area. In a few places the clay was deposited in lakes. There usually is no sharp line of demarcation separating the Recent from the Pleistocene, and some of the Pleistocene alluvium probably grades downward into similar deposits of Tertiary age. Quaternary basaltic lava occurs in several places, but altogether it covers only a small part of the region. To judge from the various degrees of weathering indicated at different places, the flows were not all contemporaneous, but they are all comparatively recent.

CLIMATE.

The climate of the region is characterized by slight annual precipitation, low relative humidity, comparatively high temperatures, both in summer and in winter, and great daily ranges in temperature.

The mean annual precipitation for the entire region probably is not more than 5 inches. At Barstow for a period of 21 years the mean annual rainfall has been 4.36 inches; at Needles for 26 years it has been 3.52 inches; and at Bagdad for 15 years it has been 3.08 inches. On the other hand, incomplete records for short periods indicate that the precipitation is somewhat greater at higher altitudes, as on the north slope of the San Bernardino and San Gabriel mountains⁵ and in the Providence and New York mountains.⁶

The mean annual precipitation is high in the mountains that border the desert on the southwest and west, but it decreases rapidly toward the interior of the desert. Thus, in Little Bear Valley, on the north side of the San Bernardino Mountains, at an elevation of 5,200 feet the mean annual precipitation for a period of 22 years was 31.36

⁵ The annual rainfall for several stations in the upper part of the Mohave River valley is given by McClure, W. F., Sourwine, J. A., and Tait, C. E., Report on the utilization of Mojave River for irrigation in Victor Valley, Calif.: California Dept. Engineering Bull. 5, pp. 36, 68, 1918.

⁶ Thompson, D. G., Ground water in Lanfair Valley, Calif.: U. S. Geol. Survey Water-Supply Paper 450, p. 36, 1920.

inches; at the forks of Mohave River for 6 years it was 14.75 inches, and at Victorville for 7 years it was 5.66 inches.⁷

About 75 per cent of the total precipitation falls in the period from December to April, inclusive. Occasionally heavy thunderstorms occur during the summer. The summer storms are often very violent, washing out roads and railroads and causing other damage.

The low relative humidity of the desert region has a notable effect on the comfort of the desert traveler. The air is usually so dry that moisture of any form exposed to the air is quickly evaporated. For this reason, although the traveler may perspire freely, the moisture given off by his body evaporates quickly, and there is no visible perspiration. If the humidity on the desert were as high as in some parts of the country, the heat would be almost unbearable, but the evaporation produces a cooling effect, and hence the traveler is seldom seriously affected as long as he can drink sufficient water to make up for the rapid loss through the skin.

High temperatures are common in summer, the thermometer frequently recording 110° and sometimes 115° to 120° in the shade and considerably higher in the sun. There is, however, a large daily range in temperature, frequently amounting to more than 30° and sometimes running as high as 45°. The evenings are nearly always delightfully cool, and the heat is seldom so great as to prevent sleep.

The winter temperatures are somewhat higher than those in regions of the same latitude farther east. The thermometer in the daytime frequently rises to 60° or more but seldom falls below 20° except in the higher parts of the region, although temperatures below 15° are occasionally recorded. The daily range is probably somewhat less in winter than in summer. In all seasons of the year the traveler will find it desirable to carry a sweater or other garment that can be discarded as the day grows warm and put on again in the evening, for the air cools very rapidly after the sun goes down.

SOILS.

The soils of the desert on the whole are very productive when water is applied to them, because the rainfall is comparatively low, and consequently no large quantity of ground water circulates through the alluvial material to dissolve and carry away the soluble mineral matter that is used by plants as food. In more humid regions a much larger proportion of the plant food is washed out of the soil and must be replaced by fertilizer. It is true, however, that most desert soils probably need fertilizer of some kind.

⁷ McClure, W. F., Sourwine, J. A., and Tait, C. E., *op. cit.*, pp. 36, 38.

Certain salts, principally those of soda, are nevertheless leached out of the soil by surface and ground waters, and are carried to the lowest parts of the numerous closed basins in the region. Here the water evaporates, leaving behind in the soil the salts it formerly carried in solution. Thus the alkali, as these salts are commonly called, continually increases in amount. Unfortunately alkali is usually most abundant in places where ground water for irrigation is most easily obtained, so that thousands of acres of desert land that would otherwise be valuable for agriculture are spoiled by alkali. Numerous attempts have been made to cultivate the smooth playas in the region, but so far these have failed, either because of alkali or because of the clayey nature of the soil. In some places layers of caliche, a hard calcareous material, lie just below the surface, hindering the tilling of the soil.

PLANT AND ANIMAL LIFE.

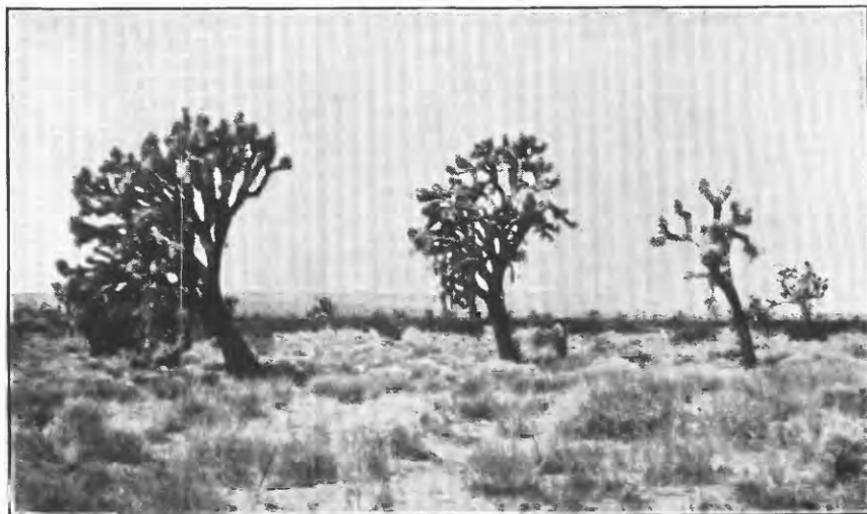
Despite the popular impression that the desert is a vast waste where but few living things, plant or animal, can exist, the observing traveler will discover not only that it contains much life, but that there is also a considerable variety, both of plants and animals. An expedition of the United States Department of Agriculture through the Mohave Desert region into Death Valley⁸ found 84 genera, including nearly 150 species, of desert shrubs and trees, and 6 genera, with 23 species, of spinous plants. The report of this expedition also lists 290 species of birds, 56 species of reptiles, more than 250 species (170 genera) of insects, and 47 species of mollusks. The mammals were not listed.

The dominant feature of the desert vegetation is its sameness throughout large areas. Certain types stand out almost to the exclusion of all others. Over most of the Mohave Desert region the creosote bush (*Larrea tridentata* Coville or *Covillea tridentata* Vail), often erroneously called greasewood, is the predominant shrub. It is generally larger than the other plants present, more or less obscuring the smaller forms that grow between the larger bushes, and it gives a monotonous appearance to the landscape. (See Pl. XIV, A.) The distribution of many of the different species is determined by the character of the soil and the depth to ground water. Where ground water is close to the surface certain typical forms are found, such as mesquite, cottonwood, willow, desert willow (not a true willow), arrowweed, and salt grass. Salt grass, salt bush, and other species are adapted to alkaline soils. These plants, however, cover

⁸ Merriam, C. H., and others, The Death Valley expedition, a biological survey of parts of California, Nevada, Arizona, and Utah: U. S. Dept. Agr. North America Fauna, No. 7, pt. 2, pp. 288-289, 345, 1893. (Part 1 of this valuable report, giving a general description of the region, was never published.)



A. TYPICAL VIEW IN MOHAVE DESERT, CALIF., SHOWING PREDOMINANT DISTRIBUTION OF THE CREOSOTE BUSH.



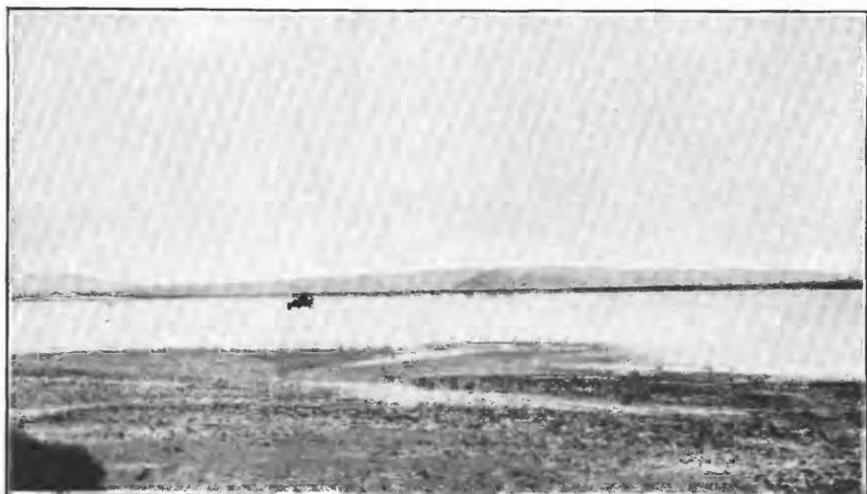
B. JOSHUA TREES OR GIANT YUCCAS.

A characteristic desert plant found above elevations of 2,500 feet.



A. A TYPICAL DESERT ROAD—NATIONAL OLD TRAILS ROAD, SOUTHEAST OF NEWBERRY SPRING, CALIF.

Profile of typical alluvial slope in background.



B. A PLAYA OR "DRY LAKE."

Some of these playas are smooth and hard, forming veritable boulevards.

only small areas. The spinous plants, such as the various cacti, the giant yucca or Joshua tree (see Pl. XIV, *B*), and the Spanish bayonet, are not so common as is generally supposed, usually being found only at elevations above 2,500 feet.

Among the desert animals the coyote and jackrabbit are common, although the coyote is more often heard than seen. Woodchucks, desert mice, gophers, and other animals are seen occasionally. Mountain sheep have been reported, even in recent years, from the more inaccessible mountains. Birds are frequently seen, although they are not as common as in more humid regions. Ducks, geese, quail, desert owls, road runners, cranes, and numerous others have been seen by the writer. Insects are particularly bothersome in the summer around evening camp fires. Reptiles are common in summer but are seldom seen in winter. Small lizards are very common in the warm months, scampering in front of the hurrying automobile so frequently as to remind one of chickens in a well-settled farm community. One of the things that surprises the desert traveler is the finding of such animals as the rabbit and lizard miles away from any known water supply. Even the tortoise is found long distances from water. It is presumed that these animals obtain the moisture necessary to sustain life from the leaves of plants or from occasional dews. It is hardly possible that they could burrow down to the water table, for in some places where such animals were seen the depth to water is more than 100 feet.

NATURAL RESOURCES.

The uninformed person usually considers the desert as a land entirely without value, but this is far from true. Its products of greatest value are obtained from mineral deposits. Some idea as to the importance of the mineral resources of the desert may be obtained by considering the value of the mineral products of San Bernardino County. This county includes the greatest part of the Mohave Desert region, and probably at least two-thirds of the value represents products from the desert part of the county.

The total value of mineral products from San Bernardino County for the 24 years from 1894 to 1918, the only years for which definite figures are available, is approximately \$56,000,000.⁹ The total value of gold and silver alone produced in the period 1882 to 1893 was \$13,000,000,¹⁰ and this figure probably represents the only mineral products of importance during that period. This large amount is due to the great production of silver from mines in the Calico district, north of Daggett, and the Grapevine district, near Barstow.

⁹ These figures were compiled from bulletins of the California State Mining Bureau giving statistics of annual mineral production.

¹⁰ Compiled from annual reports of the Director of the Mint.

As an indication of the importance of these mines the total value of silver produced in the whole State of California for the year 1884 was \$3,000,000, of which San Bernardino County contributed \$2,550,000, or 85 per cent of the total, by far the greater part from the two districts mentioned. The county produced from \$1,000,000 to \$2,000,000 worth of silver each year from 1882 to 1888, inclusive, but with the decrease in the value of silver the production fell off rapidly, and since 1901 has amounted to less than \$100,000 a year.

From 1894 to 1903 borax was an important product of this region, reaching a maximum value of more than \$2,000,000 in 1902, but the production later dropped to practically nothing. In 1916 tungsten jumped to the front, the total value of the output for the county being more than \$3,900,000, an increase from almost nothing in 1914 as a result of the development of deposits near Atolia. In 1917 the value of the tungsten produced in San Bernardino County was more than \$2,400,000, and in 1918 it was nearly \$2,000,000, but during most of 1919, owing to imports under a low tariff, the mines were shut down. Beginning with 1917 potash has become of increasing importance among the county's mineral products, having a value of more than \$2,000,000 in 1917 and nearly \$3,500,000 in 1918. The potash produced in the county comes from Searles Lake. Cement has been produced in large mills at Victorville and Oro Grande, but a large part of the output for the county comes from plants near Colton, outside of the desert region. Other minerals that have been produced in smaller quantities are copper, lead, talc, gypsum, strontianite, zinc, gem minerals, and building stones.

Agriculture is relatively unimportant in this region, although there has been considerable development in a few small areas where ground water is close enough to the surface and plentiful enough to be used for irrigation. The greatest development has taken place in Antelope Valley, in the extreme southwestern part of the region.¹¹ In this valley about 15,000 acres is under cultivation. The largest area is devoted to alfalfa, and nearly 20,000 tons of alfalfa hay was shipped out of the valley in 1919. Along the higher land on the south side of the valley, particularly around the town of Little Rock and at Valyermo post office, a considerable acreage is devoted to pears and apples. In 1919 about 1,200 tons of pears and 250 tons of apples were shipped from the south end of the valley.

In the Mohave River valley from the San Bernardino Mountains to a point a few miles east of Daggett about 10,000 acres is irrigated. The ranches in this valley that may be said to have passed through the pioneer stage are few and are more or less scattered. A great many

¹¹ Johnson, H. R., Water resources of Antelope Valley, Calif.: U. S. Geol. Survey Water-Supply Paper 278, 1911. A report is in preparation that will describe developments in the valley since the first report was published.

homesteads have been taken up, but much of the land has not been patented, and much of that which is patented is not being developed. In the vicinity of Victorville two irrigation districts have been organized under which it has been proposed to irrigate about 90,000 acres by water stored in the San Bernardino Mountains.¹² Numerous difficulties have been encountered, and the projects are still only in the preliminary stages. It is probable that not nearly the acreage originally planned for can be irrigated.

In the last few years a considerable number of homesteaders have attempted dry farming in Lanfair Valley, in the northeastern part of San Bernardino County. It is doubtful if dry farming will prove successful in this region, because the rainfall is probably not sufficient.¹³ Several hundred acres is being irrigated from wells in Indian Wells Valley, in the northwestern part of the region, but most of the ranches there are not yet productive.¹⁴

Inspired by the successful agricultural development of certain portions of the arid regions of North America by irrigation in recent years, some writers have painted colorful word pictures of these regions in the future, when man has transformed them all into productive farms. Undoubtedly there are thousands of acres that can still be developed by irrigation, and the acreage will perhaps be increased still more by changes in economic conditions that will permit a greater cost of production, or by improved methods that will increase the duty of water. Nevertheless, it is true that the quantity of water available from all sources is not sufficient to irrigate more than a small part of the aggregate area of arid land.

RAILROADS AND SETTLEMENTS.

The region is fairly accessible by railroads, the main lines of three important systems passing through it. The Valley line of the Southern Pacific Co. crosses the west edge of the desert from Palm-dale to Mojave and thence goes through Tehachapi Pass. A branch line continues north from Mojave along the east side of the Sierra Nevada. The Trona railroad is a short line leading from Searles station on the Southern Pacific to Trona. The main line of the Atchison, Topeka & Santa Fe Railway from Los Angeles to Chicago goes north from San Bernardino through Cajon Pass to Barstow and thence east to Needles. A branch line goes from Barstow to Mojave, connecting this with the Valley line of the Southern Pacific,

¹² McClure, W. F., Sourwine, J. A., and Tait, C. E., Report on the utilization of Mojave River for irrigation in Victor Valley, Calif.: California Dept. Engineering Bull. 5, 1918.

¹³ Thompson, D. G., Ground water in Lanfair Valley, Calif.: U. S. Geol. Survey Water-Supply Paper 450, pp. 29-50, 1920.

¹⁴ Ground-water conditions in this valley are described by Charles H. Lee in the report of the Conservation Commission of the State of California for 1912, pp. 401-429.

which the Santa Fe trains to San Francisco use for some distance. An important branch line of the Santa Fe runs southeast from Cadiz to Parker and Phoenix, Ariz., with a connecting line from Rice (formerly Blythe Junction) to Blythe, in Riverside County. A minor branch runs from Kramer to Johannesburg, and another from Goffs to Barnwell and Searchlight, Nev. The Los Angeles & Salt Lake Railroad uses the tracks of the Santa Fe from San Bernardino to Daggett and thence runs northeastward across the region. The Tonopah & Tidewater Railroad runs from Ludlow nearly due north, serving a large territory that contains valuable mineral resources.

There are several large towns in this region. All except two or three are at places where the railroads need many employees or where there has been much agricultural development. Mojave, Barstow, Yermo, Ludlow, and Needles are either important junction points or railroad division points. Palmdale, Lancaster, Rosamond, Victorville, Hinkley, Daggett, and Inyokern are in agricultural districts. All these towns have good stores and other facilities to meet the demands of the traveler and may be considered permanent. The other towns are either in mining districts or in regions where agriculture is being tried, but where the possibilities have not yet been proved. In the mining districts the permanence of the towns is somewhat uncertain, depending upon the continued operation of the mines, which is in turn dependent upon economic conditions throughout the nation and the world. In several places there is now almost no indication of the presence of towns that at one time or another had populations ranging from several hundred to a few thousand. Perhaps the best example is the famous town of Calico, in the Calico Mountains 10 miles north of Daggett, which in the late eighties is said to have had a population of more than 5,000. The town was dependent upon silver mines in the mountains, and when silver declined in value the population dwindled rapidly, and during the last few years only three or four men have lived among the ruins of the town while they "high graded" the abandoned mines. Within the last two years the towns of Atolia and Randsburg might have shared a similar fate, owing to the almost complete shutting down of the tungsten and gold mines, if an important and unexpected silver strike had not been made at an opportune time. Goodsprings, Nev., is another town whose population is subject to fluctuation. Most of the mining towns have had their ups and downs at one time or another. Trona, Borosolvay, and Hanksite, on Searles Lake, are supported by companies that produce potash from the old lake bed. With a large reserve of raw material at hand and a large demand these towns are less likely to suffer the vicissitudes of the ordinary desert mining town. Oro Grande and Amboy are dependent respectively on cement and gypsum manufacturing plants.

Supplies may be obtained at a number of other small places, but the continued existence of some of them is not assured. On the main railroads section crews are located every 10 or 15 miles, but a large proportion of the stations indicated on the maps are only sidings, where neither help, supplies, nor water can be obtained.

SUGGESTIONS FOR DESERT TRAVEL.

GENERAL COUNSEL.

Until recent years the traveler in the desert used burros or horses and wagons as his means of transportation. Since the advent of the automobile the use of horses has nearly ceased. With this change travel in the desert has become less difficult and has therefore increased very much. When horses were used and travel was slow, the distance between watering places was important, and it was necessary that a watering place be reached at night or that large supplies of water be carried. If a watering place was not found as expected, or if it was in bad condition, the travelers might suffer considerable hardship or even perish before reaching another place. To-day, with automobiles for transportation, the distance is of much less importance, and if water is not found at one watering place a few hours' trip will usually bring the traveler to another.

It must not be supposed, however, that travel in the desert with an automobile means travel without danger. In some respects the danger has increased. It is much easier to get a long distance from known watering places with an automobile than with a team, and a breakdown at a remote point may be very serious. Since automobiles have come into use there is also much more travel by persons not familiar with the region through which they are going. Moreover, with automobiles numerous difficulties may arise that were not encountered by those traveling with horses and wagons. Foremost of these is mechanical trouble with the engine and other parts of the automobile. A useless spark plug may be the cause of a machine becoming stalled on a sandy road many miles from any places where help may be obtained. Some weak part of the engine may break when least expected. The writer was forced to walk 25 miles after an axle of his automobile broke unexpectedly. If this accident had occurred on a midsummer day, instead of in February, the outcome might have been more serious. The automobilist also encounters road difficulties which, although hindrances to the teamster, were not so likely to prove disastrous to him. A wagon, if not too heavily loaded, can be drawn by horses through heavy sand, but an automobile may become stalled, the wheels being unable to obtain traction and sinking deeper into the sand as they spin.

Although the desert is as a whole less dangerous than in past years, the traveler must still bear in mind that emergencies may

suddenly arise that may easily prove disastrous. It is not always the newcomer who unexpectedly encounters dangerous situations, but sometimes the old prospector who has been cautious for many years and who may relax his carefulness. Almost every person who has traveled extensively in the desert can recall experiences of his own or of his friends which have resulted tragically or which might have done so under slightly less favorable circumstances. Nearly every year the desert claims one or more victims. Most of these deaths, however, are due to carelessness on the part of someone.

The writer was told by one miner of a painful experience which was due to the carelessness of a fellow traveler in failing to make certain that a sufficient extra supply of gasoline was a part of the equipment. It was not until they had nearly exhausted their supply and were turning toward home 50 miles from the nearest help that they discovered that an extra can of gasoline had not been put in at the garage as ordered. They were forced to walk the remaining distance and suffered greatly.

For the benefit of those who have occasion to travel in the desert without previous experience a number of suggestions are given below. They are based on the writer's experience in traveling more than 6,000 miles over roads of all types, and on the experiences of others who have spent many years in the arid region.

Much that is said below will not apply to the transcontinental tourist who follows well-marked roads that are used daily. The National Old Trails road that leads from east to west across the Mohave Desert region from Needles to San Bernardino is so well marked that the traveler on it can not lose his way. It is traveled by a number of machines each day—in certain seasons more than 100 daily. It lies within a mile of the Atchison, Topeka & Santa Fe Railway for almost the entire distance and at no point is more than 4 miles from the railway. Water can be obtained at stations or from section crews at least every 10 miles and usually every 5 miles. Train stops on the railway are located about every 5 miles, so that if the traveler meets with serious difficulty he will have to go only a comparatively short distance in order to obtain help if other travelers do not pass. Although the railway section crews usually give water freely to travelers, they should not be asked for it unless necessary, as the water for most of the crews is hauled in by the railway company at considerable cost. At several places the water is hauled more than 50 miles.

The traveler along the National Old Trails road therefore need only be prepared to meet such emergencies as arise in ordinary touring—for example, changing tires and making minor adjustments to the engine. However, at least one good-sized canteen of water should be carried. It is also advisable on long trips, even on the

transcontinental road, to carry a shovel. On practically all the other routes in the Mohave Desert region help can not be obtained so easily, and the routes are traveled much less frequently, some of them not for days at a time. The traveler who follows these roads should therefore be prepared for greater emergencies. No one should go in an automobile far from a town who is not sufficiently familiar with the mechanism of the machine to make necessary adjustment of the carburetor and spark plugs and other minor repairs or who can not make repairs to tires. This seemingly needless statement is made because there are many persons who know only how to manipulate the throttle and brakes of their cars. The writer has come upon such persons stalled on main roads of the desert, and they would have been in a bad plight on less traveled roads. The traveler should be sure that his car is in good condition before he starts into the desert and not merely trust to luck that nothing will happen, for on the desert roads an unusual strain is put on all parts of the machine.

EQUIPMENT.

The following equipment should be carried by travelers who expect to go very far from towns or other places where help can be obtained.

Water and gasoline containers.—Water should be carried both for drinking and for the engine radiator. Water bags are efficient in keeping the water cool, but at least one canteen should be carried in case it is necessary to walk any distance for help. A person will often consume as much as 2 gallons of water in a day if he is undergoing much physical exertion, and one should not start to walk any distance unless he carries at least a gallon canteen. Additional water may be carried in the automobile in kegs or other closed containers. Care should be taken that bags or other containers do not leak. A rope and bucket are often needed to obtain water from wells. A new car will use a large amount of water, gasoline, and oil, and on the poor roads of the remote regions all automobiles will consume abnormally large amounts. The traveler should carry more than the amount of gasoline and oil calculated to cover the required distance. The machine may unexpectedly be stalled in sand or on a grade and thus use up a large amount of gasoline. Gasoline can be obtained in 5-gallon cans. These should be kept tightly corked.

Spare parts and tools.—Enough tools should be carried to make temporary repairs, and minor spare parts that are frequently needed should be carried, such as spark plugs, fan belt, tire-repair outfit, headlight bulbs, and ball bearings. On the car used by the writer the rear hub was found to be a weak part, six or seven hubs being broken, and a spare one was always carried. A few feet of baling wire is very useful. Good extra casings and inner tubes should be

carried. If necessary the car can be operated on flat tires, or the tires can be removed. A good foot pump should be carried, and tires should be kept inflated to standard pressure to avoid rim cutting. Holes and cuts in tires should be filled with one of the standard cements for that purpose. A jack is absolutely essential.

A shovel is frequently valuable when the car becomes stalled in sand. A long-handled shovel is easier on the user's back. A good rope and tackle or one of the patented outfits for pulling out stalled cars may help to get the car safely out of an awkward position in an arroyo or across a bad gully.

ROAD DIFFICULTIES.

The uninformed traveler usually thinks of desert roads as sandy, rough, and almost impassable, but as a rule they are not. In fact, the Mohave Desert region contains hundreds of miles of desert roads that are far better than the unimproved roads of the Eastern and Central States. (See Pl. XV, A, p. 99.) The desert roads seldom become so muddy as to be impassable, and except for a few short stretches they never become so dusty as to make a journey unpleasant. There are, however, certain difficulties that these roads present, and the following suggestions are given for surmounting them.

The most common trouble is with sandy stretches of road. These stretches may be divided into two types—(a) where not only the road itself but the whole surrounding country is sandy, and (b) where the surrounding country may not be very sandy but deep sand collects in the road tracks as a result of windstorms.

Stretches of the first type are found very commonly on the eastern sides of valleys, the sand having been blown in by the prevailing westerly winds, and in dry washes. Where this condition is encountered it is essential to keep the machine in the road tracks. If the machine stalls it may possibly be backed up and a new start made. If this expedient fails after being repeated several times the sand may be dug out for a few feet in front of the machine. One of the most successful methods of getting out of sand is to corduroy the tracks with brush of any sort, rocks, or even grass. (See Pl. XVI.) If necessary, the wheels should be jacked up and the brush packed under them to give traction and prevent them from spinning. As soon as the wheels begin to spin no further attempt should be made to start until brush is put under them, for otherwise they will sink deeper into the sand. A method that has been found effective is to stretch two strips of canvas, about 10 yards long and 18 inches wide, under the wheels and in front of the car. This will often give the car a sufficient start to enable it to pass the worst stretch. It is necessary to lay the canvas under both the front and



A. VIEW SHOWING LOCATION OF BRADBURY WELL, CALIF.

The well is indicated by the arrow. Dashed line marks caterpillar road between Shoshone and the Carbonate mine. Photograph by L. F. Noble.



B. NEAR VIEW OF BRADBURY WELL.

Photograph by L. F. Noble.



ROAD ACROSS A SANDY WASH DUG OUT AND CORDUROIED WITH BRUSH.

Photograph by Kirk Bryan.

rear wheels. If not under the rear wheels it does not afford any traction, and if not held down by the front wheels it is pulled out and thrown behind the rear wheels.

In several places stretches of road were found where the tracks were filled with heavy sand, but the ground a few feet away from the road offered a fairly hard surface. In such places, if the car can be got out of the main track to the more solid ground less difficulty is experienced. The driver should be sure that a firmer surface is afforded away from the tracks, for if not he will simply get into worse difficulty by turning out. Wherever it is necessary to turn out to allow another car to pass it is advisable to keep the wheels on one side in one of the road tracks. If this is not possible it is often easier to back into the road again, following the same tracks, than to go ahead.

Many persons in crossing long sandy stretches partly deflate the tires. This gives a wider tire and a reduced wheel diameter and a correspondingly greater traction. If not too much air is let out, probably no damage is done to the tires in soft sand, but when hard ground is reached they should immediately be reinflated to the proper pressure.

Many desert roads that are otherwise good are cut by shallow cross washes from a few inches to a few feet deep. These must be crossed slowly to avoid putting a hard strain on the car. Where roads cross large washes and arroyos they may descend or ascend abruptly, and these changes of slope should also be taken slowly. If the descent into a wash is too rapid, a spring or the steering gear may be broken, or the car may plunge into deep sand.

In traveling roads that are used but little the driver must be on the watch for "high centers." Large rocks in the middle of the road may strike the underframe of the car, particularly the transmission housing or the differential housing. If these are broken the oil may drain out, causing serious trouble. "High centers" fortunately are not common. In a few places, particularly on roads composed of silty soil, the tracks may wear deep and the middle of the road will remain so high that the car can not pass. (See Pl. II, B, p. 2.) Such ruts may sometimes be "straddled."

In many places desert roads cross playas, or "dry lakes," as they are usually called. Many of these playas in dry weather have hard, smooth surfaces forming veritable boulevards that are a delight to the traveler. (See Pl. XV, B, p. 99.) In the rainy season these same playas may be lakes of mud that must be avoided. Even a light shower may make them very slippery. Other playas have a rough, soft surface, but after a track has been broken across them they usually present no difficulties to the automobile. A very few playas

are wet and soft throughout the year, and vehicles can not be driven across them.

ROADS TO WATERING PLACES.

The field work on which this report is based was undertaken with the object of making it as easy as possible for desert travelers in this region to find water. Numerous signs were erected directing to watering places, but the funds available were insufficient to pay for signs at all road junctions. The places listed on the signs, with only three or four exceptions that are mentioned in the logs, are all known to be reliable watering places. The traveler must often use his own judgment in keeping to the proper road and in finding the watering places. In many places where there are no signposts the maps will prove particularly useful in indicating the proper road to be followed. Even if a branch road is not indicated the general direction of the main road will be shown on the map. A study of the topography may suggest the course or destination of a road that is not indicated on the map. The traveler should obtain the best maps available. The maps accompanying this guide are believed to be the most accurate at the time they were compiled, although it is known that they contain inaccuracies, and, moreover, changes in roads will be made from time to time.

It should be remembered that desert routes change unexpectedly. A road used for many years may be washed out by a heavy rain and fall into disuse. Prospectors frequently camp at one place for several weeks, and the road to their camp will become well marked, possibly more so than the main road to more distant points. Once established, these unimportant roads may under desert conditions persist for years. Because of these varying conditions the traveler before starting into a region that is new to him should make careful inquiry from prospectors and others in regard to the condition of roads and watering places, checking the information carefully with the maps at hand. Garage men are usually well informed in regard to road conditions. It is well not to depend on the memory for information about routes, but to request the informant to draw a sketch map, with distances and directions as nearly correct as possible. Particular inquiry should be made to be sure that water is still available at watering places that are to be visited.

TYPES OF WATERING PLACES.

On the large maps (Pls. IX, X, XI, XII, and XIII) all features printed in blue indicate water. One who is using the maps for information in regard to watering places should refer to the explanation of symbols on the map to be sure that water is available. A few words of additional explanation may be desirable.

Three types of wells are indicated on the maps—flowing wells, nonflowing wells without pumping plants, and nonflowing wells with pumping plants. Nonflowing wells may be either dug or drilled; flowing wells are drilled. The usefulness of a nonflowing well as a watering place depends upon a means of getting the water to the surface, such as a pump or a rope and bucket.

In certain parts of the region there are a great many wells that are not shown on the map. This is particularly true of Antelope Valley, Indian Wells Valley, Superior Valley, and the Mohave River valley—that is, districts where many homesteaders have taken up claims. Many of these wells have no pumping equipment, or if equipped with power pumps they are useless unless some one is at hand to operate the machinery. For various reasons many of the homesteads are unoccupied for periods of several months. The map shows only those wells where it is probable that water can be obtained at all times. In Antelope Valley ranches are so numerous and wells so close together that it was not considered necessary to show them. Water can usually be obtained from flowing wells, but sometimes such wells may be capped, in compliance with State laws, after they have flowed freely for long periods, and water may no longer be obtainable from them.

Several abandoned or "dry" wells have been shown on some maps as watering places and are still frequently referred to as landmarks in giving directions to travelers. Furthermore, some persons do not know that these wells are no longer reliable sources of supply. It is thus deemed advisable to show these wells on the accompanying maps, but to indicate that they are dry or abandoned.

The water in some of the wells is poor, being either highly mineralized or insanitary. These wells have been shown on the maps, however, usually with a note that the water is poor or bad. The water from such wells may generally be used for automobile radiators or for horses and cattle, even though it may not be fit for human consumption.

Springs are likely to be in bad condition, being more easily polluted than wells, but they can usually be cleaned out in a few minutes, and if the spring has a stream flowing from it the water will soon become clear. If the spring has no visible outlet care must be exercised in cleaning away leaves and other débris, lest mud and sand be stirred up which may be a long time in settling. The most dangerous kind of pollution is that caused by human excreta.

What are commonly known as "tanks" are shown at a few places on the maps. These are natural reservoirs or basins formed in various ways in rocks and filled by rain water. Water may remain in the tank from a few days to several months, the time depending upon the size of the basin and other conditions. Some of the tanks may be

filled with sand, which, however, holds a considerable quantity of water that may be obtained by a little digging. Tanks of this type are known as "sand tanks." In some places tanks are valuable as a source of supply to prospectors, but as they are usually situated in the more mountainous country and are not easily found, they are not of much importance to the average desert traveler.

Water is hauled to many railroad stations in cars and stored in cisterns or other reservoirs which are shown on the map. Nearly all these reservoirs are at section houses or small towns where help can be obtained.

Permanent streams and lakes are so rare in the desert region that they are practically of no importance as sources of water supply for travelers. Even where they occur better sources of water are usually available. Intermittent streams—that is, those which flow for only a part of the year—are likewise of little importance to travelers. They usually flow only after heavy rains, and then the water is likely to be too muddy to be used. They are never to be counted upon as sources of supply.

Playas, or "dry lakes," are never sources of water supply. They contain water only after heavy rains, and the water then is too muddy to be of any use. They are to be considered by the traveler only with reference to the condition of the roads that cross them.

FINDING WATERING PLACES.

Watering places are not always readily seen from the road, and a search must be made for them. (See Pl. IV.) Foot trails and paths made by cattle may lead to a spring or a well. Camp débris, such as tin cans and camp-fire remains, is often evidence that water is to be found near by. In mountainous country springs or wells are usually found in gravelly washes or in rocky canyons, particularly where the wash or canyon is somewhat constricted by rock ledges. In the large open valleys wells and springs are usually found in the lower parts of the valleys. The presence of water is in many places indicated by certain forms of vegetation, particularly salt grass, crawling mesquite, and arrow weed. Certain types of willows and the screw-bean mesquite do not necessarily indicate the presence of water.

QUALITY OF DESERT WATERS.

The newcomer on the desert usually has the notion that all desert waters are bad and that he must simply endure them, his thirst never being quenched. He is surprised when he finds that in most places the water is not brackish or bitter, and that in some places it is as

good as that used for public supplies in the less arid States, if not better. It is true that some of the waters are very brackish or bitter, and the analyses made in the Geological Survey laboratory indicate that one or two samples are more highly concentrated than sea water. The waters of poor quality are generally found in wells or springs situated in the lowest parts of closed basins. The waters from springs or wells in the mountains are usually comparatively good.

Most of the waters that are not positively distasteful can be used for drinking in small quantities without deleterious effects. If highly mineralized waters are consumed in large quantities they may cause serious physiologic disturbances, which, although they are usually only of a temporary nature, may be so weakening that the result may be fatal. The most dangerous waters are usually so distasteful that the traveler will not swallow them unless his sense of taste has been deadened by intense suffering from thirst.

Any ill effects produced by waters are usually due to the presence of large quantities of sodium sulphate (Glauber salt), magnesium sulphate (Epsom salt), sodium carbonate, or sodium chloride (common salt). Waters containing large amounts of the sulphates of sodium or magnesium have a bitter taste. Waters that contain sufficient quantities of these two substances to impart a perceptible taste, if used even in moderation, have a laxative effect, but they may serve to quench the thirst and will not cause serious discomfort. If they are used in large quantities the laxative effect may be so great as to prove serious. Waters containing large amounts of sodium carbonate have a characteristic soapy taste and cause a burning sensation in the mouth. They produce a nauseating effect. Waters of this character that are sufficiently concentrated to prove harmful are rare in the region described in this report. Waters high in sodium chloride (common salt) have a salty taste. If very much salty water is drunk it will have a nauseating effect. Waters that taste slightly salty may be drunk, but they are not effective in slaking thirst.

The waters from a number of springs or wells in the area described in this paper have been reported to contain arsenic or similar poisons. Careful tests of samples of these waters have failed to reveal the presence of any of these poisonous substances.

The notes in the logs in regard to the quality of water at different places refer principally to the quality so far as mineral content is concerned. Bacteriologic or other sanitary analyses were not made. Desert wells and springs are not usually dangerously polluted. If there is any question as to the sanitary quality of any water it should be boiled before being drunk.

EMERGENCIES.

As has already been emphasized, the traveler should as far as possible be prepared to meet any emergency that may arise. Occasionally, however, something happens that no preparation or foresight can prevent. Serious breakdowns may occur that can not be repaired, or an automobile may become hopelessly stalled, and there is nothing to do but walk. In such circumstances it is a common tendency for the traveler, especially if he is not very familiar with the desert, to become panic-stricken. He should, however, consider the conditions carefully and without excitement. On a hot summer day he should rest in the shade of the car or a bush until the heat of the day is passed, walking mostly in the cool night hours. He should carry a canteen of water and if the distance is great some food, taking care to avoid thirst-producing foods, such as dried beef or other salty meats. He should consider the various possible sources of help and should consult the map to determine the nearest places, with intermediate watering places, conditions of travel, etc. The traveler should at all times know approximately how far he is from the places where help can be obtained.

Unless he can tell directions accurately from the sun and stars the traveler should always carry a compass. As he passes through new country he should make it a habit to locate prominent features that will serve as landmarks, and as far as possible he should become acquainted with their appearance from different directions. Ordinarily it is dangerous to leave a road and cut across country to save distance, unless the saving is great and the traveler is certain of the conditions to be met. This is particularly true if it is likely that it will be necessary to cross mountains.

The traveler should remember that for various reasons it is very difficult to estimate distances in the desert. A mountain that seems only a mile or two away may be 10 miles away. He should not go far from camp at any time without a canteen of water.

In conclusion it may again be emphasized that much depends on the traveler himself. If his machine is in good condition, and if he understands it, keeps it in good condition, and drives it carefully, he will have little difficulty. It is then only the occasional, unavoidable accident that may prove dangerous. Even in such an event the person who remains calm and free from panic is in comparatively little danger.

MAIN ROUTES OF THE DESERT.

That part of southern California known as "the desert" is shut off from the somewhat better-watered country along the Pacific coast by high mountains. These mountains, known at various places from

northwest to southeast as the San Gabriel Mountains, the San Bernardino Mountains, the San Jacinto Mountains, and the Santa Rosa Mountains, extend almost due east from the Pacific Ocean between latitudes 34° and $34^{\circ} 30'$ beyond the cities of San Bernardino and Redlands, whence they trend somewhat east of south to the Mexican border. They act as a barrier to travel, which is concentrated through a very few passes. Access from the west to the region considered in this report may be had at only three places, but farther south, near the Mexican border, several roads lead through the mountains. Roads from the large cities converge toward these passes and, after crossing the mountains, diverge again in various directions. The principal routes of the Mohave Desert region are shown on Plate VIII.

WESTERN ROUTE (MIDLAND TRAIL).

The westernmost route into the desert leads northwestward from Los Angeles, by way of San Fernando, to Saugus, a distance of 34 miles. From Saugus the traveler has a choice of two routes, known as the Bouquet Canyon route and the Mint Canyon route, both of which lead northeastward to Mohave Desert. Either of these roads may be followed to Mojave. The Mint Canyon road, leading first to Palmdale, is paved and is therefore the one generally used. From Mojave the road leads northward to Big Pine, and thence northeastward through Goldfield and Tonopah to Ely, Nev., where it joins the Lincoln Highway, the main road to Salt Lake City and the East. This route is known as the Midland Trail.

From Saugus a third road, known as the Ridge route, branches northwestward through Tejon Pass to San Joaquin Valley and thence to Bakersfield and San Francisco, but this route does not touch the desert. The Bouquet Canyon and Mint Canyon routes are also used by travelers bound for Bakersfield. On the north side of the mountains the traveler who follows either of these roads may turn west and reach the Ridge Road a few miles south of Tejon Pass, or he may go to Mojave and thence turn west through Tehachapi Pass to Bakersfield and San Francisco.

The Midland Trail is used extensively for travel from southern California to Salt Lake City and eastern points. It is also used a great deal by travelers going only to Antelope Valley, just north of the mountains, now a comparatively well-settled farming country, and to the mining districts near Randsburg and Searles Lake. Only general descriptions are given for the Bouquet Canyon or Mint Canyon routes from Los Angeles to the desert. (See pp. 157-159.) These roads are much traveled, and along them water and supplies can be obtained at short intervals. They have been well signposted

by the Automobile Club of Southern California, and maps on which they are shown in detail may be obtained at the headquarters of this club in Los Angeles. Roads east of the Southern Pacific Railroad on the desert side of the mountains are described in later pages.

CENTRAL ROUTE (NATIONAL OLD TRAILS ROAD).

The greater number of travelers bound for the desert follow the routes that lead eastward along the south side of the San Gabriel Mountains from Los Angeles to San Bernardino and Colton. From these two places two routes diverge to different parts of the desert, one leading northward to the Mohave Desert region, and the other leading eastward to the desert areas of Riverside, Imperial, and San Diego counties, often called the Colorado Desert. From San Bernardino the National Old Trails road goes northward, crossing the mountains through Cajon Pass, to Barstow. Thence it continues in an easterly direction to Needles, about 305 miles from Los Angeles, and crosses Colorado River into Arizona 15 miles farther southeast. This is the main transcontinental route between southern California and the Eastern States. Important roads branch from this main road at several places. At Barstow roads go northward and northeastward to Death Valley and mining regions in eastern California and southeastern Nevada. At a point 16 miles west of Needles a road known as the Arrowhead Trail leads northward to Searchlight and Las Vegas, Nev., and to Salt Lake City, Utah. This road is not much used by travelers to Salt Lake City, except when the Midland Trail is closed in the winter by deep snow in the mountains. At Cadiz and Needles branches lead southeastward to Parker, Ariz., and thence to Phoenix.

Cajon Pass is the natural gateway to nearly the whole of the desert region described in this report and shown on the large maps. An area in the southern part of the region shown on Plates X and XI, which may be called Dale Basin, is most easily entered from the north end of Coachella Valley, which adjoins it on the south (see pp. 243-248), because the roads leading into this basin from the National Old Trails road are rendered practically impassable by sand.

SOUTHERN ROUTES (OCEAN TO OCEAN HIGHWAY).

Southeast of San Bernardino there is another break in the mountains, San Geronio Pass, which allows access to the desert part of Riverside County and the northern part of Imperial County. Many eastbound travelers go through this pass to Mecca and Blythe, cross Colorado River by a ferry at Ehrenberg, and thence proceed to Phoenix. Roads also lead southeastward through the Salton Basin to Imperial Valley and Yuma, but these places are also reached

by a road from San Diego which follows closely the Mexican border. Travelers from San Diego to Phoenix use the latter route. The southern routes are variously known as the Ocean to Ocean Highway, the Trail to Sunset, or by other names. The roads in the desert part of Riverside, Imperial, and San Diego counties are described in a preliminary guide by John S. Brown,¹⁵ and the geography, geology, and hydrology of the region in a more complete report by the same author.¹⁶

ROUTES BETWEEN LOS ANGELES AND PHOENIX.

Three main routes lead from Los Angeles, Calif., to Phoenix, Ariz., on each of which, however, there are optional roads for short distances. The road to be chosen depends largely upon individual preferences of the travelers. The statements given below are based on conditions as they were in 1918. Inasmuch as plans were underway for the improvement of portions of the main roads, and as the conditions of the roads change from time to time, the traveler should make inquiry locally as to the conditions affecting the choice of roads. The Automobile Club of Southern California issues frequent bulletins stating the condition of each of the main routes.

The northern route, and the longest one, runs by way of the National Old Trails road north and east from San Bernardino to Needles, thence south to Parker, where Colorado River is crossed by a ferry that is operated practically every day of the year. From Parker the road leads southeast to Phoenix. The total distance from Los Angeles to Phoenix by this route is almost 530 miles. The road for most of the distance follows closely the Atchison, Topeka & Santa Fe Railway, and supplies and water can be obtained at short intervals along it, except for a stretch of 60 miles between Needles and Parker. This road, as a whole, may be classed as good desert road, except for a few miles on each side of Colorado River. By leaving the National Old Trails road at Cadiz and running south to Parker, the traveler may save 38 miles, but because of the poor condition of the road between these points, he will probably make better time by following the longer route by way of Needles.

The central route between Los Angeles and Phoenix, which is the shortest of the three, leads eastward from Los Angeles through San Gorgonio Pass to Mecca and thence east through Blythe, crossing Colorado River by ferry at Ehrenberg. From Ehrenberg the road leads to Quartzite and thence to Bouse, where it joins the northern route from Parker to Phoenix. The distance by this road is only

¹⁵ Brown, J. S., Routes to desert watering places in the Salton Sea region, Calif.: U. S. Geol. Survey Water-Supply Paper 490, pp. 1-86, 1920 (Water-Supply Paper 490-A).

¹⁶ Brown, J. S., The Salton Sea region, Calif., a geographic, geologic, and hydrologic reconnaissance: U. S. Geol. Survey Water-Supply Paper — (in preparation).

425 miles. It has, however, several disadvantages. In California there is a stretch of 95 miles on which no supplies can be obtained, and the road is very sandy for considerable distances. The ferry at Ehrenberg usually does not operate for three months during the summer because of high water. In Arizona the road is rough for a stretch of about 20 miles east of Colorado River. The traveler on leaving Quartzite instead of going to Bouse may follow an optional route which joins the Parker-Phoenix road at Vicksburg. The distance to Phoenix by this route is 14 miles shorter, but it is much rougher than the road by way of Bouse, which is the one most often used by travelers who follow the central route.

The third route from Los Angeles to Phoenix lies some distance south of the central road. It is the most direct route from San Diego to Phoenix, leading eastward close to the Mexican border, through the Imperial Valley to Yuma and thence to Phoenix. The distance from Los Angeles to Phoenix by this route is 520 miles; from San Diego it is 390 miles. This road is the natural route to Phoenix from San Diego, being the shortest one of the three from this point, but for travelers starting at Los Angeles other things than distance must be considered. In California about 30 miles of very sandy road is encountered in the sand-hill area east of the Imperial Valley. In Arizona the road is very bad for a stretch of about 45 miles along Gila River between Wellton and Palomas. The traveler from Los Angeles may follow the central route east to Mecca and thence go southeast on the west side of Salton Sea, joining the southern route at El Centro. This road follows a roundabout route, however, and is only 25 miles shorter than that by way of San Diego. Long stretches of boulevard road on the latter make it the preferable one of the two.

Although the central route is approximately 100 miles shorter than the other two, it is used to a less extent than the longer roads. Probably as many travelers use the northern route as use the southern route. Logs of the central and southern routes in California are given in the guide to watering places in the Salton Sea region by J. S. Brown, mentioned above, and the logs for the parts of all three of these roads in Arizona are given in a guide by Clyde P. Ross.¹⁷ More detailed descriptions of both areas are given in complete reports now in preparation.

ROAD LOGS.

In the following pages are given logs of the principal roads in the area covered by this report. The logs are given for the benefit of those who desire only a brief guide that will enable them to follow

¹⁷ Ross, C. P., Routes to desert watering places in the lower Gila region, Ariz.: U. S. Geol. Survey Water-Supply Paper 490, pp. 271- (in preparation).

the proper route during hurried trips across the desert. A report is being prepared which will contain much more information on the location and character of watering places and on the geography, history, geology, and water resources of the region.

The mileage given in the logs has been determined as accurately as possible, but doubtless there are errors. The traveler should remember that over a given distance not only will speedometers on different machines seldom register alike, but also even the same speedometer will seldom show exactly the same mileage on two different trips. This discrepancy may be due to several causes, including principally differences in the inflation of the tires.

If, because of insufficient inflation or a heavy load, a 30-inch tire, where it touches the ground, is depressed 0.1 inch from its standard radius, the flattening of the tire is hardly noticeable, but in a distance of 1 mile the speedometer will register 0.014 mile too much. This is a negligible error for short runs, but in 100 miles it amounts to 1.4 miles; and on a run from San Bernardino to Needles, for instance, a distance of 245 miles, it would amount to nearly 3.5 miles. It is obvious that two tires will seldom be inflated to exactly the same diameter, so that the speedometers on two different vehicles will show a greater or less difference.

Because of such variations as are mentioned above, the traveler should not be surprised if his speedometer does not check with the mileages given in the logs. If he finds his speedometer registering over or under the mileage given, the difference increasing at a nearly uniform rate, he should make proper allowance. If the difference becomes large, it may be advisable to reset the speedometer to agree with the log, so that he will recognize the indicated turns, road forks, or other landmarks.

A great number of important roads cross the region in different directions and there are a great many possible combinations of routes which are frequently traveled and for which logs might be given. In many of these combinations there is a duplication of portions of several stretches of road. For instance, logs might be given for the routes from Randsburg to Lone Willow Spring and Wingate Pass by way of Blackwater Well and Granite Wells, from Randsburg to Silver Lake, and to Crutts post office and Barstow by way of the same points, and from Barstow to Lone Willow Spring, and a certain portion of the log of each route would be repeated. To prevent the report from being too bulky, however, certain routes are given as units and cross references are given at junction points to logs for intersecting roads. In this way the traveler may travel any series of roads. In changing from the log of one road to another it will be desirable to set the speedometer to the mileage given for the junction point on the new road.

It should be remembered that in some parts of the desert the roads vary from time to time. The main routes, however, change but little from year to year. Before making trips into the less traveled parts of the area local inquiry should be made in regard to changes in the roads or the certainty of obtaining water at the important watering places. In the logs the names of places at which water may be obtained are printed in boldface type. The locations of signposts erected by the United States Geological Survey and of many of those erected by the Automobile Club of Southern California (usually abbreviated here to "Automobile Club") are indicated in the logs to aid the traveler in identifying a road fork or other point. With a few exceptions logs are given for roads in both directions.

SAN BERNARDINO-NEEDLES-TOPOCK (NATIONAL OLD TRAILS ROAD).

This road is one of the main routes used by travelers going between southern California and the Eastern States. It is one of three routes used by travelers going to Phoenix and other parts of Arizona (see p. 115), and is also used to some extent by persons going to points in Nevada and to Salt Lake City. The road is the main artery of travel of the desert area of San Bernardino County, branch roads leading from it to all parts of the region. It passes through several towns where supplies and accommodations may be obtained. For most of the distance the road lies within a few hundred yards of the main line of the Atchison, Topeka & Santa Fe Railway. Water can be obtained at many places along the road. The road is usually in good condition for most of the distance, being kept in repair by the county. The route has been marked for the entire distance by signs erected by the Automobile Club of Southern California. It is traveled practically every day of the year, and persons who are equipped for ordinary touring need not hesitate to use it, but they should carry extra tires and equipment to make minor repairs and meet minor emergencies.

SAN BERNARDINO TO TOPOCK (265 MILES).

[For log of road in opposite direction see pp. 124-130.]

- 0.0 **San Bernardino.** Third and E streets. Go west on Third Street.
- 1.0 Ascend Incline of viaduct, turning to left (north) over railroad.
- 1.2 North end of viaduct. Automobile Club sign. Paved road to left (west) is Foothills Boulevard to Los Angeles (60 miles). Go north on Mount Vernon Avenue on macadam road.
- 3.2 Turn obliquely to left (northwest) along railroad. Good paved road.
- 8.5 **Verdemont station.** Water at section house.
- 8.8 Cross railroad and turn to left along railroad. Avoid road going northwest on left side of track and also one going east.
- 11.2 Small store a quarter of a mile east of Devore station. Avoid right branch and continue northwest close to dry wash of Cajon Creek.
- 12.9 Signpost marking south boundary of Angeles National Forest. No fires may be made in the limits of the forest without a permit from the local forest ranger. There are also certain restrictions on hunting in this area. The ranger station is about 5 miles farther up the canyon.

- 13.6 Old road comes in across wash from south.
- 15.2 Old road leads west across Cajon Creek to **Keenbrook station** (about half a mile), where **water** can be obtained in an emergency.
- 16.7 Old paved road forks to left and crosses Cajon Creek and railroad, leading to Lone Pine Canyon. Follow right-hand road on east side of creek. In the next mile road is partly hidden from the driver by sharp curves, requiring careful driving.
- 17.5 **United States Forest Service ranger station** on left side of road. **Water.**
- 18.0 Old road comes in on left from across creek.
- 18.1 **Cozy Dell.** **Water** from pipe at trough on east side of road.
- 19.6 **Cajon station.** **Water.**
- 20.1 Monument on right side of road dedicated to the Pioneers of 1849, marking the point where the old Salt Lake trail (which comes down a canyon from the east) ends at the present new road. Continue on paved road.
- 20.3 **Camp Cajon**, a public camp ground, on the left. **Water**, food supplies, and gasoline at a small store.
- 20.8 Branch road goes to left (northwest) leading to Cajon Canyon.
- 21.6 Cross southbound track of railroad.
- 22.4 Cross northbound track of railroad near **Alray station.** **Water** may possibly be obtained at section houses west of crossing.
- 23.8 Sharp S turns.
- 24.3 Branch road to left leads to Phelan post office and **Mirage Valley** by way of **Baldy Mesa.** Nothing is known about this road, but if it is always in good condition it is a short cut to Llano, Valyermo, Palmdale, and Lancaster.
- 25.4 Road is cut into side of steep cliff, with clear view of road obstructed by turns, necessitating careful driving.
- 26.5 Summit of Cajon Pass. End of paved road. Road leads northeast down a long slope. Plans have been made for a State road from the summit to Victorville, and this road when built will probably follow a different route from that given below, but if it does the traveler should have little difficulty in following the main road.
- 27.3 Signpost marking northern boundary of Angeles National Forest.
- 28.2 Branch road comes in on right (south). **Automobile Club sign.**
- 28.8 Road forks. **Automobile Club sign.** Road on left (approximately north) leads to **Hawes, Kramer, and Randsburg**, by way of **Adelanto post office**, and to **Llano, Palmdale, and Lancaster.** (See pp. 130-133.) Follow right-hand road, which a short distance beyond this point turns sharply east up a short hill and then leads in a straight course north-east to **Hesperia.**
- 33.3 High-power electric-transmission line. Road parallel to this line is not in good condition and should be avoided.
- 36.7 **Hesperia.** West side of railroad. **Water, gasoline, garage, and hotel.** Roads lead west to Llano and Palmdale and east to Apple and Lucerne valleys. Many travelers going to **Bear Valley** by way of the desert turn east at **Hesperia** and join the road from Victorville to **Box S ranch** and **Bear Valley** near **Fifteenmile Point**, about 15 miles northeast of **Hesperia.** (See p. 143.) This road can not be used at certain times of the year when the ford over **Mohave River** is impassable. Leaving **Hesperia** for **Victorville, Barstow, Needles, etc.,** follow **Atchison, Topeka & Santa Fe Railway** on west side. The new road from the

summit to Victorville may possibly avoid Hesperia and follow approximately the road to Victorville, which is shown on the map 4 miles west of Hesperia.

- 44.9 Turn to left at southwestern outskirts of Victorville.
- 45.0 Turn to right.
- 45.1 **Victorville** post office. **Water**, gasoline, and general supplies obtainable. Good hotel and garage accommodations available. From Victorville roads lead southwest to Box S ranch, Lucerne Valley, Big Bear Valley, and Old Woman Springs (see pp. 142, 145); northeast to Barstow and Daggett by way of Sidewinder Well and Stoddard Well (see p. 147); west to Llano, Little Rock, and Palmdale (see pp. 138-140), and to Adelanto, Mirage Valley, and Lancaster (see pp. 140-142); and north to Randsburg by way of Hawes and Kramer (see pp. 135-136). The National Old Trails road to Barstow and Daggett continues north along the railroad. Leaving Victorville post office go north one-tenth of a mile, turn east and cross railroad.
- 45.3 East of railroad go north, about 100 yards east of track.
- 46.5 Cross to west side of railroad and turn to right (north).
- 48.2 Branch road on left (northwest) near top of hill leads to Hawes and Randsburg by way of Helendale ranch. (See p. 135.) Automobile Club sign.
- 48.6 Cross bridge over Mohave River. On south side of bridge a road goes to left (west) connecting with the Hawes road a short distance beyond.
- 50.9 **Oro Grande** (Halleck post office). **Water**, gasoline, and general supplies. Continue north through Oro Grande.
- 51.8 Cross to east side of railroad and turn to left (north) parallel to track.
- 53.9 Main road turns northeast, leaving railroad. Branch road continues along track to ranches.
- 56.2 One-quarter of a mile east of **Bryman** station. **Water** at railroad section houses.
- 60.4 Road branches northwest toward river, with sign directing to Hinkley, Kramer, Randsburg, and Mohave. The ford across the river at this point is dangerous and this road should be avoided.
- 61.3 **Helen** station. **Water**.
- 62.0 Main road turns east up a wash; branch road continues along railroad.
- 63.2 Branch road on right (east) goes toward mountains. Main road (left) continues northeast.
- 66.1 Branch road turns to left (west) toward **Wild** station (0.2 mile). **Water** at section houses.
- 71.5 **Hicks** station (Palliser post office). **Water**, gasoline, and a limited amount of supplies at small store.
- 82.9 Crossroads at south end of Barstow. Turn to left (north). Road to east leads to Box S ranch, Big Bear Lake, and Victorville, by way of Stoddard and Sidewinder wells. (See pp. 148-150.) (See fig. 3 for map of road leading into Barstow.)
- 83.1 Turn to left (west) 200 feet south of railroad.
- 83.3 Turn to right (north) and cross several railroad tracks. Dangerous crossing. On north side of tracks turn to right and go east on main street of Barstow.
- 83.4 Automobile Club sign. Branch road turns to left (north) across tracks, leading to Kramer, Mojave, Randsburg (see p. 150), Crutts post office, Goldstone, and Ballarat (see p. 181), Silver Lake, Cima, Nipton, Goodsprings, and Death Valley (see p. 191).

- 83.5 **Barstow post office.** Good hotels and garages. General supplies obtainable. Leaving Barstow, go east on main street.
- 83.9 Turn northeast across railroad. Dangerous crossing.
- 84.1 Turn south across switch, then east along main track over hill.
- 85.7 Cross to south side of railroad and turn east parallel to track.
- 90.3 Road comes in from southwest (right). Automobile Club sign. This road leads to Box S ranch, Big Bear Valley, and Victorville, by way of Stoddard and Sidewinder wells. (See p. 149.)
- 90.4 Branch road north leads to ranch, 0.2 mile. **Water.**
- 92.4 Cross to north side of railroad and turn east along tracks. Automobile Club sign. A road leads south (right) to Ord Mountain. (See p. 217.)

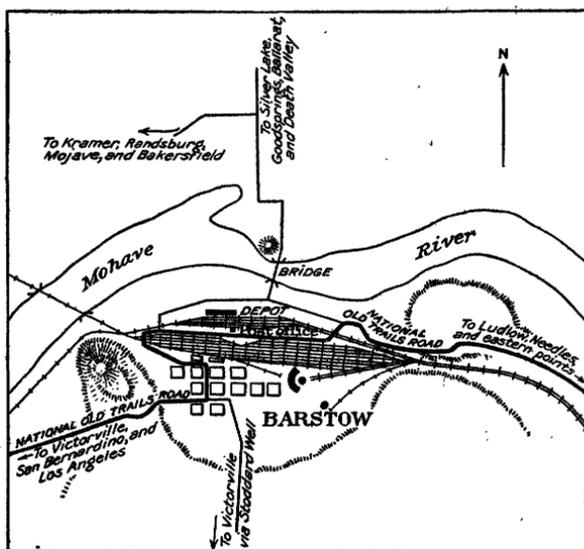


FIGURE 3.—Sketch map of Barstow, Calif., showing roads leading from the town.

- 92.6 **Daggett.** Opposite depot. **Water, gasoline, and general supplies.** From Daggett a road leads north to Yermo, Silver Lake, Saratoga Springs, and Death Valley, to points along the Los Angeles & Salt Lake Railroad (see p. 214), and to Crutts post office, Copper City, Randsburg, and Ballarat (see p. 213).
- 92.9 Cross Los Angeles & Salt Lake Railroad and continue east parallel to Atchison, Topeka & Santa Fe Railway. In the next few miles water may be obtained at several ranches.
- 98.7 **Minneola station.** **Water.** Turn to right (south) across railroad and then to left (east) along it.
- 103.3 Branch road (left) continues along railroad. Main road turns to right and passes to right of low butte.
- 104.1 Ranch house on right.
- 104.5 Road forks on east side of gap between small butte and main mountain mass. Automobile Club sign. Branch road on left leads through gate to **Newberry Spring, 100 yards** behind butte. **Good water.** Good camp ground. Gasoline and food supplies at **Newberry station** (Water post office) **0.3 mile** north of spring. Turn to right (southeast), following along foot of mountain.

- 106.9 Faint road on right (south) leads to Kane Spring. It is probably impassable for automobiles. (See p. 258.)
- 108.8 Branch road on left leads to ranch.
- 109.3 Main road turns to right (south). Branch road straight ahead is short cut through **Loman ranch**, where **water** and sometimes oil and gasoline may be obtained.
- 110.0 Turn to left (east).
- 110.9 Road comes in on left from **Loman ranch**.
- 114.1 Branch road turns to right (southeast) to mine prospects in the mountains.
- 115.7 Turn to left (northeast) and cross narrow neck of lava flow from volcanic crater several miles southeast.
- 116.1 Old road comes in on left (west).
- 116.3 Turn to right parallel to railroad.
- 118.1 Turn slightly to right and leave railroad. Branch road on left continues along railroad to **Hector station** (1 mile). **Water** obtainable at station.
- 120.1 Road comes in on left from **Hector station**.
- 124.0 Cross railroad.
- 129.2 Branch road on right (south) goes to **Lavic station** (0.2 mile) and to mines several miles south of railroad. (See p. 219.) **Water** at station.
- 132.7 Cross a road that leads southeastward (right) to **Argos station** and northwestward (left) to **strontianite mine**, 3 miles distant.
- 137.4 Cross **Tonopah & Tidewater Railroad**.
- 137.9 Turn to right and cross railroad. Road to left (north) leads to **Broadwell**. (See p. 219.)
- 138.1 Turn to left on main street of **Ludlow** (**Stagg post office**). Depot on right. Garage and hotel accommodations and general supplies obtainable. A road leads south to mines at **Stedman**. (See p. 220.) Leaving **Ludlow**, go east along north side of railroad.
- 141.1 Turn to right (south) and cross railroad.
- 141.2 Road forks. Either branch may be chosen. In February, 1918, the left fork was most used, and log is given for it.
- 143.6 Branch road comes in on right (southwest) from the optional road just mentioned. Main road bends left to railroad.
- 144.4 Branch road comes in on right (southwest) from the optional road mentioned.
- 145.0 Avoid road to right, parallel to railroad, and cross to north side of track. From this point the most traveled route lies north of the railroad. Another road lies south of the railroad, being reached by the right-branch road at mile 141.2, but it was little used early in 1918. The road that lies on the south side of the railroad crosses low hills, and farther on follows close to the track. On this road **water** can be obtained at **Siberia station**. The disadvantage of the road is that it is slightly sandy in places and is occasionally washed out by heavy rains. The road on the south side joins the most-used road at **Amboy**. The log is given for the road north of the railroad.
- 149.1 Branch road on right (south) leads to **Klondike station** (0.8 mile). Automobile Club sign. **Water** obtainable at section houses.
- 159.8 Branch road on right (south) leads to **Bagdad**. **Water**, meals, gasoline, and supplies at store.
- 160.2 Branch road on left (northeast) goes to **Orange Blossom mine**, 10 miles. (See p. 221.) Road comes in on right from **Bagdad**.

167. 7 **Amboy.** **Water**, gasoline, general supplies, and hotel and garage accommodations available. A road goes south from here to Dale. (See p. 221.)
173. 3 Oiled road begins. Old road on right (southeast) should be avoided.
180. 5 Branch road on right (south) leads to **Cadiz** station (3.5 miles). **Water** at station. No supplies available. This road, beyond Cadiz, leads southeast to Parker and is sometimes known as the Parker cut-off road. (See pp. 221-224.) Most travelers, however, prefer to go to Needles and thence south to Parker. (See pp. 239-241.) This road also leads to Rice (formerly called Blythe Junction), Blythe, and Vidal. A road going to the left (northwest) from the junction leads to a mine prospect in the near-by mountains. Continue east.
187. 7 Old road comes in on right from **Siam** station (3.7 miles), where water is obtainable; end of oiled road.
192. 1 Branch road turns to right (southeast) to **Danby** (0.6 mile); **water**, gasoline, and food supplies. From Danby a road leads south to the Cadiz-Parker road. (See pp. 221-222.) A road on left (northwest) leads to Bonanza Spring and mines in Clipper Mountain. (See p. 227.)
193. 3 Branch road on left. This is the former main road, now abandoned.
201. 5 **Essex** station. **Water** at section houses.
208. 4 **Fenner.** **Water**, meals, gasoline, and groceries. From Fenner roads lead west and northwest to mines in the Providence Mountains (see p. 228) and to Lanfair, Cima, Valley Wells, and other points. (See p. 229.)
213. 0 **Piute** station. **Water** at section houses.
217. 9 Cross railroad at west end of Goffs.
218. 2 **Goffs** post office. **Water**, gasoline, and general supplies; hotel. From here a road leads north to Lanfair, Barnwell, Nipton, and Goodsprings. (See p. 233.) Continue along railroad.
218. 3 Turn to right, cross railroad, and go southeast, avoiding right-hand road, which leads to Louise mine (6 miles south).
222. 6 Turn to left, avoiding washed-out road on right.
225. 9 **Homer** station on left. **Water** at section houses.
230. 6 **Bannock** station on left. **Water** at section houses.
232. 3 Branch road turns to left (north) and crosses railroad. Several large signs here. This road is the Arrowhead Trall, leading to Searchlight, Las Vegas, and Salt Lake City. (See p. 238.)
233. 5 Branch road on left leads to **Ibis** station, the location of which is indicated by the top of a derrick over the railroad pumping plant. **Water** may be obtained at the station.
236. 6 **Spring** on right side of road near willows.
237. 0 **Klinefelter** station. **Water** usually obtainable in grove of trees on east side of railroad through pipe line from spring at mile 236.6. Continue along on west side of railroad.
240. 5 Road passes under railroad and turns east along it.
241. 8 **Java** station. **Water** at section houses.
246. 4 Road comes in on left from Lake Tapia.
247. 7 Turn to left parallel to railroad.
248. 1 Turn to right and cross railroad at west end of Needles, then turn to left.
248. 6 Depot at Needles. Turn to right, then to left, around park.
248. 7 **Needles** post office. Good hotels, garages, and stores. At Needles one may cross Colorado River by ferry to roads leading to Mohave City

and to Kingman, Ariz., by way of the Oatman mining region. Kingman is also reached by a road crossing Colorado River over a bridge at Topock. This road is about 25 miles longer, but it follows the railroad closely, whereas the shorter road leads directly across the desert. The log is given for the road to Topock. Leaving Needles go southeast on street along railroad or one block south of railroad to southeast end of town, following signs of the Automobile Club of Southern California.

- 249. 1 Turn to right (south).
- 249. 2 Turn to left (east).
- 249. 4 Turn to right (south), cross two railroad switch tracks near large oil tanks, and ascend hill a short distance beyond. Several old roads cross the main road, but the latter is unmistakable.
- 253. 0 Branch road on right leads to mines in Sacramento Mountains.
- 253. 2 Branch road on right leads to mines.
- 254. 4 Road forks, marked by several large signs. Road on right leads to Parker, Ariz., Calzona, Vidal, and Rice (formerly Blythe junction), Calif., and is known as the Parker cut-off. (See p. 239.) For Topock and the East take left road.
- 263. 0 Pass large sign near the "Mystic Maze," an old Indian ceremonial ground.
- 264. 8 Bridge over Colorado River.
- 264. 9 **Topock, Ariz. Water, gasoline, and some supplies.** From Topock the road continues to Kingman and farther east. The road was not traveled by the writer east of Topock, but it is marked by signs of the Automobile Club of Southern California. A road also leads from Topock north to Mohave City and to the Oatman mining district.

TOPOCK TO SAN BERNARDINO (265 MILES).

[For log of road in opposite direction see pp. 118-124.]

This road is one of the main routes used by travelers going between the Eastern States and southern California, and it is the main artery of travel in the desert area of San Bernardino County. (See p. 118 for note on watering places, supplies, etc., along the road.) The road was not traveled east of Topock, Ariz., and the log begins at that point.

- 0. 0 **Topock, Ariz. Water, gasoline, and some supplies obtainable.** Go southwest across wagon bridge over Colorado River. On far side of river the road winds along side of cliff, later turning away from it. Road is well marked and can not be mistaken.
- 2. 1 Pass large sign near the "Mystic Maze," an old Indian ceremonial ground.
- 10. 5. Branch road comes in on left (south), marked by several signs. This road is known as the Parker cut-off, and leads to Parker, Ariz., and Calzona, Vidal, and Rice (formerly called Blythe Junction), Calif. (See p. 239.)
- 11. 7 Branch road comes in on left from mines in Sacramento Mountains.
- 11. 9 Branch road comes in on left from mines.
- 15. 3 Cross two railroad-switch tracks on outskirts of Needles.
- 15. 5 Turn to left away from railroad toward center of town.
- 15. 7 Turn to right at cross streets.
- 15. 8 Turn to left.
- 16. 2 **Needles post office. Good hotels, garages, and stores.** Leaving Needles, go west along south side of railroad.

16. 7 Turn to right and cross railroad, then turn to left (west) along track.
17. 1 Turn to right away from railroad.
18. 4 Road forks. Automobile Club sign. Follow road on left (northwest) up long wash.
23. 1 **Java** station. **Water** at section houses.
24. 4 Turn to left, pass under Atchison, Topeka & Santa Fe tracks, and shortly beyond turn to right up an alluvial slope.
27. 9 **Klinefelter** station. **Water** usually obtainable in a grove of trees on east side of railroad through a pipe line from a spring at mile 28.3.
28. 3 **Spring** on left side of road near willows.
31. 4 Faint road on right leads to **Ibis** station, the location of which is indicated by a derrick at the railroad pumping plant at that place. **Water** can be obtained at the station.
32. 6 Branch road on right (north) leads across railroad. Several large signs here. This road is the Arrowhead Trail, leading to Searchlight, Las Vegas, and Salt Lake City. (See p. 238.) Main road continues west on south side of railroad.
34. 3 **Bannock** station on right. **Water** at section houses.
39. 9 **Homer** station on right. **Water** at section houses.
41. 4 Turn to left away from railroad.
42. 3 Old washed-out road comes in on left.
46. 6 Cross railroad and turn to left along it.
46. 7 **Goffs** post office. **Water**, gasoline, general supplies, and hotel accommodations. From Goffs a road leads north to Lanfair, Barnwell, Nipton, Goodsprings, and other points. (See p. 233.) Continue west, going to the north of the houses along the railroad.
47. 0 Cross branch railroad at west end of Goffs.
51. 9 **Piute** station on right. **Water** at section houses.
56. 5 **Fenner** station. **Water**, meals, gasoline, and groceries. From Fenner roads lead west and northwest to mines in the Providence Mountains (see p. 228), and to Lanfair, Cima, Valley Wells, and other points (see p. 229).
63. 4 **Essex** station. **Water** at section houses. A short distance west of station the road turns north away from railroad.
71. 6 Branch road comes in on left. This is the former main road, now abandoned.
72. 8 Branch road turns to right (south) to **Danby** (0.6 mile), where **water**, gasoline, oil, and a small amount of food supplies may be obtained. From Danby a road leads south to the Cadiz-Parker road. (See pp. 221-222.)
77. 2 Road forks. Main road bends to right. Oiled road begins. Branch road to left is old main road, now abandoned. It leads to **Siam** station (3.7 miles), where **water** can be obtained.
84. 4 Branch road comes in on left (southeast). Automobile Club sign. This road leads to **Cadiz** station (3.5 miles), where **water** can be obtained, and thence to Rice (formerly called Blythe Junction), Vidal, and Parker. (See pp. 221-222.) A branch road also leads to the right (northwest) from this point to mine prospects in the near-by mountains.
91. 0 End of paved road. An old road comes in on left from Cadiz.
97. 2 **Amboy**. **Water**, gasoline, meals, general supplies, and small hotel and garage. A road leads south from Amboy to Dale. It is very little used. (See p. 221.) In January, 1918, the road that was most used west of Amboy lay on the north side of the track, but another road

- branches from this road on the western outskirts of Amboy and turning south crosses the track and leads westward along the railroad, joining the other one a few miles east of Ludlow.
- 104.7 Branch road on left (southwest) leads to **Bagdad** (0.5 mile), where **water**, meals, gasoline, oil, and food supplies may be obtained. From this point a branch road also leads northeast to the Orange Blossom mine (10 miles). (See p. 221.)
- 105.1 Branch road comes in on left from Bagdad. For several miles beyond this the road leads along the foot of low hills.
- 115.8 Branch road on left (south) goes to **Klondike** station (0.8 mile). Automobile Club sign. **Water** obtainable at section houses.
- 119.9 Cross to south side of railroad.
- 120.4 Road forks, one road continuing southwest, the other turning to right. Either may be chosen, but the one to the right is shorter. The left branch, a short distance beyond, joins the road which lies on the south side of the railroad from Amboy.
- 121.3 Another fork. Either of the two roads may be chosen. Mileage is given by the right-hand road.
- 123.7 Road comes in on left. This connects with the optional roads mentioned at mile 120.4 and mile 121.3. It is the road which lies on the south side of the railroad from Amboy. A road continues west on south side of railroad, but the main road crosses to north side of railroad and turns west along it.
- 126.8 **Ludlow** railroad station on left. Hotel and garage accommodations and general supplies. From Ludlow a road leads south to mines at **Stedman**, about 8 miles south of Ludlow. (See p. 220.) A road also leads northward, but it is passable for automobiles for only about 10 miles. (See p. 219.) Leaving Ludlow, turn to right (north) near station and pass schoolhouse (on left).
- 127.0 Cross switch track and immediately turn to left (west). Branch road on right (north) leads to **Broadwell**, beyond which point road is impassable for automobiles.
- 127.5 Cross Tonopah & Tidewater Railroad.
- 132.2 Cross a road that leads southeast (left) to **Argos** station and northwest (right) to **strontianite** mine, 3 miles distant.
- 135.7 Branch road on left (south) leads to **Lavic** station. Automobile Club sign. **Water** at station (0.2 mile). From Lavic a road leads south to mines several miles from the railroad. (See p. 219.)
- 140.9 Cross railroad.
- 144.8 Branch road on right (northwest) leads to **Hector** station (1.1 miles). **Water** at station. From the station a road continues west, joining the main road again at mile 146.8.
- 146.8 Road comes in on right (from east) from Hector station. Main road follows close to railroad.
- 148.6 Road bends to left (southwest) leaving railroad.
- 148.8 Old road branches to right (west).
- 149.3 Cross narrow neck of lava flow, and immediately beyond turn to right (west).
- 154.0 Branch road leads to right. This road is a short cut through **Loman ranch**, joining main road again at mile 155.6. **Water** and sometimes gasoline and oil may be obtained at the ranch. Main road continues due west.
- 154.9 Turn to right (due north).

155. 6 Road comes in on right (southeast) from Loman ranch. Main road bends to left.
156. 1 Branch road comes in on right.
158. 0 Branch road on left (south) leads to Kane Spring. The spring probably can not be reached from the north by automobile. (See p. 258.)
159. 2 Road approaches foot of mountain and follows closely along it.
160. 4 Branch road on right leads through gate to **Newberry Spring**, 100 yards away. Automobile Club sign. Main road bends to left (west), passing between a low butte and the main mountain mass. **Good water** at Newberry Spring; also **good camping ground**. From the spring a road leads north to **Newberry station** (Water post office) (0.3 mile), where gasoline and a limited amount of food supplies may be obtained. From Newberry station roads lead northeast to old Camp Cady and to numerous ranches. (See p. 218.)
160. 8 Ranch house on left.
161. 6 Branch road comes in on right, along railroad. Main road continues west along track.
166. 2' **Minneola station**. **Water** at section houses. Cross to north side of railroad and turn west along it.
172. 0 Cross Los Angeles & Salt Lake Railroad tracks at east end of Daggett.
172. 3 **Daggett**. **Water**, gasoline, oil, and general supplies obtainable. From Daggett a road leads northward to Yermo, Silver Lake, Saratoga Springs, Death Valley, and points along the Los Angeles & Salt Lake Railroad (see p. 214), and to Crutts post office, Randsburg, and Ballarat (see p. 213).
172. 5 Cross to south side of railroad and turn west along the tracks. A road leads south to mines in Ord Mountain. (See p. 217.)
174. 5 Branch road on right (north) leads to **ranches**, where **water** may be obtained.
174. 6 Road forks. Automobile Club sign. Road on left leads to Box S ranch, Bear Valley, and Victorville by way of Stoddard and Sidewinder wells. (See pp. 148-150.) It leads entirely through unsettled country and is not recommended to tourists. It is used by local travelers. Continue on right-hand road.
179. 2 Cross to north side of railroad and turn to left, ascending hill some distance beyond.
180. 8 Turn to right, crossing switch on eastern outskirts of Barstow, and then to left past oil tanks. (See fig. 3, p. 121, for diagram of roads leading into Barstow.)
181. 0 Turn to left and cross railroad at a dangerous crossing. Avoid road straight ahead along north side of railroad which leads to station. On south side of railroad turn to right along main street of Barstow.
181. 3 **Barstow post office**. Good hotels, garages, and all general supplies. From Barstow roads lead north to Crutts post office, Ballarat, and Randsburg (see p. 181), and to Paradise Springs, Silver Lake, Saratoga Springs, points in Death Valley, Valley Wells, Cima, Nipton, and Goodsprings, Nev. (See pp. 191, 196.) A road leads west to Hinkley, Kramer, Atolla, Randsburg, Mohave, Bakersfield, and San Francisco. (See p. 150.) Leaving Barstow go west on main street.
181. 5 Branch road turns to right (north) across railroad. Automobile Club sign. This road leads to Mohave, Randsburg, and Silver Lake. Main road continues west, a short distance beyond turning to left (south) and crossing several railroad tracks.

- 181.6 South side of railroad; turn to left, bending slightly away from tracks.
- 181.8 Turn to right (south).
- 182.0 Crossroads, south end of Barstow. Automobile Club sign. Main road turns to right (west). At this point a branch road turns east. This leads to Box S ranch, Bear Valley, and Victorville by way of Stoddard Well. (See pp. 148-150.) It passes through unsettled desert and is not recommended for tourists. It is used by local travelers.
- 192.4 **Hicks** station (Palliser post office). **Water**, oil, gasoline, and a limited amount of food supplies.
- 198.8 Branch road on right (west) leads to **Wild** station (0.2 mile). **Water** at section houses.
- 201.7 Branch road on left (east) leads toward mountains. Automobile Club sign. A short distance beyond the main road turns to right, descending a wash.
- 202.9 Turn to left (south), ascending short hills. Branch road comes in on right. Automobile Club sign.
- 203.6 **Helen** station. **Water** at station house.
- 204.5 Branch road leads northwest toward river, at small sign directing to Hinkley, Kramer, Randsburg, and Mohave. The ford across Mohave River at this point is dangerous and the road should be avoided.
- 208.7 A quarter of a mile east of **Bryman** station. **Water** at railroad section houses.
- 211.0 Road approaches railroad and continues southward along it. Branch road comes in on right. Automobile Club sign.
- 213.1 Cross to west side of railroad, turn to left, and continue along it.
- 214.0 **Oro Grande** (Halleck post office). **Water**, gasoline, and general supplies. Continue south along railroad.
- 216.3 Cross bridge over Mohave River. On south side of the bridge a road goes to right (west), leading to Helendale ranch, Hawes, and Kramer. (See mile 48.6 of log on p. 135.)
- 216.7 Branch road comes in on right (northwest) at top of hill. Automobile Club sign. This road joins the one near the bridge which leads to Helendale, etc. (See mile 48.2 of log on p. 135.) Main road bends to left.
- 218.4 Cross to east side of railroad, and beyond turn to right (south). Dangerous crossing.
- 219.6 Near center of Victorville turn to right, cross railroad, and beyond turn to left (south) along west side of park.
- 219.8 **Victorville** post office. Good hotels, restaurants, and garages, gasoline, and all general supplies. From Victorville roads lead northeast to Sidewinder and Stoddard Well, and thence to Barstow and Daggett (see p. 147); southeast to Box S ranch, Lucerne Valley, Old Woman Spring, and Bear Valley (see pp. 142, 145); west to Llano, Little Rock, and Palmdale (see p. 138), and Adelanto, Mirage Valley, and Lancaster (see pp. 138, 140), and north to Hawes, Kramer, and Randsburg (see pp. 135, 141). Leaving Victorville, go west one block from post office and turn to left.
- NOTE.—In 1919 plans were being made to build a new road between Victorville and the summit of Cajon Pass, 18 miles farther south. It was considered possible that the new road would follow a different route, avoiding Hesperia. If this road is built the traveler should have no difficulty in following it without directions.
- 220.0 Turn southwest up wash, southwest end of Victorville.

228. 2 **Hesperia.** Water and gasoline. Hotel and garage accommodations. Leaving Hesperia go south along railroad to south end of town, then turn to right (west) for about half a mile, then turn to left (south-west) on long straight road.
231. 6 High-power electric-transmission line. A road along the power line is in bad condition and should be avoided.
236. 1 Branch road comes in on right (northwest). Automobile Club sign. This road leads to Adelanto, Helendale ranch, Hawes, Kramer, Randsburg, Llano, Valermo, Little Rock, Palmdale, and Lancaster. (See mile 28.8 of log on p. 131.)
236. 7 Avoid branch road to left. Automobile Club sign. Main road beyond ascends grade.
237. 6 Signpost marking northern boundary of Angeles National Forest. No fires may be built within the boundaries of the forest without a permit from the forest ranger. State laws prohibit the killing of certain animals within the bounds of parts of the forest reserve.
238. 4 Summit of Cajon Pass. Paved road begins. Road winds along steep mountain side, requiring careful driving.
241. 1 Sharp S turns at end of grade along steep slope.
242. 5 Cross northbound track of Atchison, Topeka & Santa Fe Railway near **Alray** station. Water obtainable at section houses west of crossing.
243. 3 Cross southbound track of railroad.
244. 1 Branch road comes in on right (northwest).
244. 6 **Camp Cajon** on right; a public camp ground. Water; supplies at small store.
244. 8 Monument on left side of road, dedicated to Pioneers of 1849, marking the point where the old Salt Lake Trail (which comes down a canyon from the east) ends at the present new road.
245. 3 **Cajon** station. Water at station house.
246. 8 **Cozy Dell.** Water at trough on left side of road.
246. 9 Avoid old road branching to right and crossing creek.
247. 4 **United States Forest Service ranger station** on right. Water. In the next mile the road is partly hidden by sharp curves, requiring careful driving.
248. 2 Branch road comes in on right.
249. 7 Old road on right (west) leads across Cajon Creek to **Keefbrook** station, where water can be obtained in an emergency.
251. 3 Avoid old road branching to right across wash.
252. 0 Signpost marking south boundary of Angeles National Forest.
253. 7 Road intersection. Automobile Club sign. Turn to right (south). Gasoline and oil obtainable at a small store near this point.
256. 2 Cross to southwest side of railroad and turn southeastward along it.
256. 4 **Verdemont** station. Water at section houses.
261. 7 Diagonal road intersection. Turn south (right) on Mount Vernon Avenue, San Bernardino.
263. 7 North end of viaduct over railroad. Automobile Club sign. Road to San Bernardino leads south over the viaduct, turning sharply to left at south end. Run slowly. Road on right (west) is the Foothills Boulevard to Pasadena and Los Angeles. No log is given for this road, but road cards of the route may be obtained at the office of the Automobile Club of Southern California in San Bernardino.
263. 9 East end of viaduct. Go east on Third Street, past Atchison, Topeka & Santa Fe Railway station.

264.9 **San Bernardino**, Third and E streets. From San Bernardino the traveler may go to Los Angeles by either of two roads, the Foothills Boulevard or the Valley Boulevard. Logs are not given for these routes, but signs are posted along the roads, and the traveler should have no difficulty. Roads also lead to Riverside, Redlands, and to resorts in the San Bernardino Mountains. A road leads eastward by way of Redlands into the Salton Basin, connecting with roads to the Imperial Valley and the desert parts of Riverside and Imperial counties. Maps and logs of these desert roads are published in Water-Supply Paper 490-A.

SAN BERNARDINO TO BEAR VALLEY.

From San Bernardino roads lead to numerous resorts in the San Bernardino Mountains, where some of the most popular places are on Bear Lake, or "Big Bear," as it is often called to distinguish it from Little Bear Lake. These resorts and the roads to them are not in the desert area, and logs of these roads are therefore not given here, but a few brief notes are added. Most of the resorts are reached by one of two routes. The "Crest route" leads northward from San Bernardino up Waterman Canyon and rises rapidly by a winding course to the crest of the San Bernardino Mountains, from 5,000 to 7,000 feet above the sea, along which it leads eastward to Bear Lake. From this road, on a clear day, the traveler may obtain wonderful views of the San Bernardino Valley and other lowlands, broken by hills and mountains, extending westward to the Pacific Ocean and, to the north, the great expanse of Mohave Desert.

The alternate route, known as the Mill Creek road, leads north from Redlands into the mountains, ascending Mill Creek canyon for some distance and then crossing the flank of the San Bernardino Mountains into the canyon of Santa Ana River. The road leads up the precipitous north side of Santa Ana Canyon with a very winding course to Bear Valley, which lies at an elevation of 6,800 feet above sea level. From Mill Creek canyon to the summit, near Bear Lake, the road is necessarily very tortuous, with many "switchbacks," which wind back and forth in such a way that the grade is nowhere more than 6 per cent. The road is narrow, in most places there being no room for vehicles to pass, and it has been necessary to establish "controls." By this system the traffic is allowed to proceed in only one direction during certain hours.

Many tourists enter Bear Valley by one route and return by the other. The two routes combined are popularly known as the "101-mile drive on the rim of the world." The distance to Bear Lake by way of the Crest route is about 60 miles, and from Redlands by the Mill Creek road it is about 40 miles. Water, gasoline, and other supplies can be obtained at several places. Because of the long grades, the traveler should have plenty of gasoline. Many travelers return to San Bernardino by a road leading across the desert to Victorville (see p. 144) and thence south on the National Old Trails road by way of Cajon Pass.

SAN BERNARDINO-ATOLIA-RANDBURG.

From San Bernardino there are several possible routes to Randsburg, and each follows the National Old Trails road through Cajon Canyon and past the summit of Cajon Pass. The shortest route leaves the National Old Trails road 28.8 miles north of San Bernardino and leads north past the Doble ranch to Adelanto post office. Thence it turns northwest, following along the

Southern Sierras Power Co.'s transmission line, on a new road made in 1919, to the Atchison, Tokeka & Santa Fe Railway, thence west along the railway to Kramer and north to Atolia and Randsburg. The second route is the same as the first to Adelanto, whence it goes east a mile and thence north past the Helendale ranch to Hawes, on the Santa Fe Railway, and thence west to Kramer. This route is 10 miles longer than the first one. Until 1919 it was the one generally used between San Bernardino and Randsburg, as the road along the power line between Adelanto and the railroad was very sandy. The road along the power line, however, was scraped out by the county, and it was planned to surface the few sandy stretches in such a way that they would not be troublesome. The road to Hawes is principally useful for those going to the region around Hinkley. As an alternative, persons traveling the Hawes route may follow the National Old Trails route to a point 3 miles north of Victorville and then turn northwest to the Hawes road. This route is 17 miles longer than the first one. Some travelers follow the National Old Trails road to Hélen, where they ford Mohave River and join the Hawes road at Helendale ranch. This route is not recommended, as several machines have stuck in the river bottom at Helen. The third possible route is to follow the National Old Trails road to Barstow and thence go west to Kramer. This route is 44 miles longer than the shortest route along the power line and 34 miles longer than the route by way of Hawes and is therefore seldom used, although it is probably the safest road for those not accustomed to desert travel.

SAN BERNARDINO TO ATOLIA AND RANDSBURG (DIRECT ROUTE, 104 MILES).

[For log in opposite direction see p. 133.]

- 0.0 **San Bernardino.** Leaving Third and E streets, follow route of National Old Trails road to mile 28.8, as given on pages 118-119.
- 28.8 **Road forks.** Automobile Club sign. Left-hand road is direct route to Randsburg by way of Dobie Ranch, Adelanto, and Southern Sierras Power Co.'s transmission line and also for part of the distance is the route by way of Helendale ranch and Hawes. The log is given for this road. The road is also used for a short distance by travelers going to Llano, Valyermo, Palmdale, and Lancaster. The road from this point by way of the power line as far as Kramer was not traveled by the writer, and the log is made up from measurements taken from the Hesperia topographic sheet and other maps. The road has been marked with signs by the Automobile Club so that the traveler should have no difficulty in following it. The right-hand road is the National Old Trails road and should be followed by those who desire to go to Randsburg by way of Victorville or Barstow.
- 29.9 **Road forks.** Right-hand road leads to Hesperia and Victorville. Follow road to left for Adelanto post office, Randsburg, etc., and to Llano, Palmdale, etc.
- NOTE.**—The road may have been changed recently and the mileage for road forks before 31.3 may not be correct, but the traveler will probably have no difficulty in determining which is the main road.
- 30.5 **Road forks.** Continue on right-hand road. Road to left leads to Llano, but it is reported that the right-hand road is better to these places.
- 31.3 **Road forks.** Follow road to left due north on section line. Avoid all branch roads.
- 33.0 **Crossroads.** Continue north. Road to right (east) leads to Hesperia (5.5 miles). Road to left (west) leads to Phelan post office (about 10 miles).

36. 2 Road comes in on left from Phelan post office.
38. 5 Crossroads. At **Dobie ranch**. Automobile Club sign. **Water** at ranch. Road to right leads to Victorville. (See mile 45.4 of log on p. 140.) Road to left (west) leads to Llano, Valyermo, Little Rock, Palmdale, and Lancaster. (See mile 7.0 of log on p. 138.) Continue north.
43. 5 (approximate) Crossroads. Automobile Club sign. Turn left (west) to Adelanto post office. Road to right (east) leads to Helendale ranch (see p. 135) and Hawes, and also to the National Old Trails road 3 miles north of Victorville.
44. 0 **Adelanto** post office. **Water**, gasoline, and groceries. Continue west. **Neither water nor gasoline is obtainable for 30 miles**, so the traveler should be sure he has plenty before he leaves Adelanto.
44. 3 Crossroads. Turn north.
44. 8 Crossroads at electric-power line. Turn obliquely to left (northwest) on scraped road along power line. It is said that the road closely parallels the power line for the next 28.5 miles. Sandy stretches are encountered. Road to left (west) leads to El Mirage post office. (See p. 141.)
73. 3 (approximate) East-west road along Atchison, Topeka & Santa Fe Railway. Turn left (west) on road that leads to Kramer, Randsburg, and Mojave. Road to right (east) leads to Hinkley and Barstow. (See mile 41.3 of log on p. 153.)
75. 8 Railroad crossing at **Kramer**. **Water**, gasoline, and food supplies at small store; also sleeping accommodations for a few persons. Cross railroad and continue north for Atolia, Johannesburg, Randsburg, and Trona. Road continuing west on south side of track leads to Muroc, Mojave, and points beyond Tehachapi Pass. (See mile 35.7 of log on p. 151.)
87. 1 Faint road on right (northeast) leads to **Fremont** station (2 miles), where **water** can be obtained at houses of section crew.
93. 3 Pass under electric-power transmission line.
94. 7 Crossroads. Automobile Club sign. Continue north. Road on left (southwest) is from Mojave. Persons going from Kramer to Mojave in rainy weather, if they can not cross Rogers Dry Lake, must come north to this point and turn southwest. (See mile 9.3 of log on p. 166.) On right (northeast) this road leads to Blackwater Well, Granite Wells, and points in south Death Valley.
97. 5 Road forks. Automobile Club sign. Right branch leads to Atolia and Randsburg. The left branch is a short-cut road to Randsburg. Mileage is given by way of right-hand road.
99. 2 **Atolia**. Crossroads at station. In 1918 **water**, gasoline, general supplies, and hotel accommodations were obtainable, but in 1919 the mines were closed, and the continued existence of the town is uncertain. As late as January, 1920, watchmen and others were still living in the town and water and supplies were obtainable. From Atolia a road leads east to Blackwater and Granite Wells and thence to Silver Lake and points in south Death Valley (see p. 178), or to Barstow by way of Copper City. Leaving Atolia continue north parallel to the railroad.
101. 1 Road forks. Automobile Club sign. Follow left-hand road to Randsburg and Johannesburg, leaving railroad.
102. 1 Intersection with paved road. Follow this road past several intersecting roads, across divide, parallel to electric-power transmission line.

103. 6 Road forks east end of Randsburg near substation of Southern Sierras Power Co. (on right). Right-hand road leads to Johannesburg (1 mile); left-hand road is main street of Randsburg.
104. 0 **Randsburg.** Post office on left. **Water**, gasoline, supplies, hotels, and garage. From Randsburg roads lead north to Trona, Ballarat, and points in north Death Valley and to Inyokern and the Midland Trail (see pp. 167, 170); west to Garlock and Cantil and thence to Mojave (see p. 164); and east to Granite Wells, Silver Lake, and points in south Death Valley and to Barstow by way of Copper City (see pp. 171, 178).

**RANDBURG AND ATOLIA TO BARSTOW, VICTORVILLE, AND SAN BERNARDINO
(DIRECT ROUTE, 104 MILES).**

[For log of road in opposite direction see p. 131.]

This route is used by travelers going from Randsburg, Atolia, and points north thereof to San Bernardino and Victorville. The road for part of the distance is the same as that used by persons going to Barstow. At several places alternate roads may be chosen. These optional roads are indicated in the log at the proper points. (See also p. 136.)

0. 0 **Randsburg** post office on right. Go east on main street of town.
0. 4 Road forks, east end of Randsburg. Automobile Club sign. Branch road on left comes from Johannesburg. Main road (paved) turns to right up wash; substation of Southern Sierras Power Co. on left. Continue on paved road, over divide, and thence southeast downhill, avoiding all crossroads.
1. 9 Road forks. Take road on left along east side of hill. This road leads to Atolia, but if the traveler desires he may continue on the paved road to right around west side of hill, coming onto main road at mile 6.5.
2. 9 Branch road comes in on left along railroad. Automobile Club sign.
4. 8 **Atolia.** Crossroads at station. In 1918 **water**, gasoline, supplies, and hotel accommodations were available. Early in 1919 the mines near the town were closed, and its continued existence is uncertain. As late as January, 1920, watchmen and others still lived there, and **water** and supplies were obtainable. From Atolia a road leads east to Blackwater and Granite Wells, and thence to Silver Lake and points in Death Valley, or to Barstow by way of Copper City. (See p. 178.) Most travelers going to Barstow continue on the San Bernardino road, which leads south along west side of railroad.
6. 5 Road comes in on right from north. This is the optional route mentioned at mile 1.9.
9. 3 Crossroads. Automobile Club sign. Road on right (southwest) leads to Mojave and Los Angeles. (See mile 9.3 of log on p. 166.) Road on left (northeast) leads to Blackwater Well, Granite Well, and Death Valley points. Continue straight ahead (south).
10. 7 Pass under high-power electric-transmission line.
16. 9 Faint road comes in on left (northeast) from Fremont station (2 miles), where **water** can be obtained at houses of section crew.
28. 2 **Kramer.** Railroad crossing. Automobile Club sign. **Water**, gasoline, and food supplies obtainable at a small store; also sleeping accommodations for a few persons. Cross railroad and turn to left (east) along track. Road on right (west) along railroad leads to Muroc, Mojave, Lancaster, and Bakersfield. (See mile 35.7 of log on p. 151.)

- 30.7 High-voltage electric-power transmission line on steel towers. A new road, made by the county since the field work on this report was done, is reported to follow southeast along this power line to Adelanto, and is the shortest and now most generally used route to San Bernardino. The road along the railroad continues eastward to Barstow. (See mile 41.3 of log on p. 153.) Formerly the main route to San Bernardino led eastward to Hawes and thence southward by way of the Helendale ranch (see p. 136), but it is not used so much now. The log given here is for the road along the power line. As this road was not traveled the log is given only approximately for the next 55 miles, distances being obtained from available maps. It is understood that the road has been marked with signs by the Automobile Club. **No water or gasoline is obtainable until Adelanto is reached, a distance of nearly 30 miles.** So far as is known the road is close to the power line for the next 28.5 miles.
- 59.2 (approximate) Intersection with north-south road and east-west road, near Adelanto. Turn obliquely to right (south) on main traveled road.
- 59.7 Turn left (east)..
- 60.0 **Adelanto.** Water, gasoline, and groceries. Continue east.
- 60.5 Crossroads. Automobile Club sign. Turn right (south). Avoid all branch roads.
- 65.5 Crossroads at **Doble ranch.** Automobile Club sign. **Water** at ranch. Road to left (east) leads to Victorville (7.0 miles); road to right (west) leads to Llano, Valyermo, Little Rock, Palmdale, and Lancaster. (See mile 7.0 of log on p. 138.) Continue straight ahead (south).
- 67.8 Avoid branch road on right (southeast) which leads to Phelan.
- 71.0 (approximate) Crossroads. Continue south. Road to left (east) leads to **Hesperia** (5.5 miles). Road to right (west) leads to **Phelan** post office (about 10 miles).
- 72.7 Road comes in on left (from northeast). Bend slightly to right.
- 73.5 Branch road comes in on right (from northwest).
- 74.1 Branch road comes in on left (from northeast).
- 75.2 (approximate) Junction with National Old Trails road (on left). Continue south on this road to **San Bernardino** (104.0 miles), following log from mile 236.1 on page 129 for mileage from this point.

SAN BERNARDINO TO RANDSBURG AND HINKLEY BY WAY OF HAWES.

[For log of road in opposite direction see p. 136.]

This route was, until recently, the one most used by travelers going between San Bernardino and Randsburg, but since the opening of the new road along the Southern Sierras power line (see p. 130) it is not so much used. It is traveled mostly by persons going to ranches on the west side of Mohave River north of Victorville and in the vicinity of Hawes and Hinkley.

- 0.0 **San Bernardino.** Leaving Third and E streets, follow route of National Old Trails road to mile 28.8, as described on pages 118-119.
- 28.8 Road forks. Road to left is the shortest road to Randsburg, by way of Adelanto. (See p. 131.) It is also the shortest road to Helendale ranch and Hawes, but these points can be reached by following the right-hand road (the National Old Trails road) to a point 3 miles north of Victorville. The log is given for both routes to Hawes.

Left-hand road (by way of Adelanto).

- 28.8 Road forks. Follow log of direct route to Randsburg from mile 28.8 on page 131 to mile 43.5.
- 43.5 Road forks. For Helendale, Hawes, and Hinkley turn to right (east). Road to left (west) is direct route to Randsburg. Water, gasoline, and groceries may be obtained at **Adelanto, 0.5 mile west.**
- 44.5 Crossroads. Turn left (north). Road straight ahead (east) leads to National Old Trails road 3 miles north of Victorville.
- 46.0 Crossroads. Geological Survey sign. Continue north. Road coming in from southeast is from National Old Trails road. (See right-hand column.)

Right-hand road (by way of Victorville).

- 28.8 Road forks. Continue on right-hand road, following log of National Old Trails road on pp. 119-120 through **Victorville** (mile 45.1) to mile 48.2.
- 48.2 Branch road to left, at top of hill 0.4 mile south of bridge across Mohave River. Automobile Club sign. Follow road to left, leaving National Old Trails road.
- 48.6 Road comes in from right (east) from National Old Trails road. Road continues along river.
- 49.0 Road leads through gate, passing through **Turner ranch.** Water at ranch. Avoid road to right at gate, along river bottom. Some distance beyond the ranch the road forks, the right-hand branch going around the point of a hill, the left-hand going over the hill. They unite at mile 51.4.
- 51.4 Roads intersect diagonally. Left-hand branch (west) leads to **Adelanto** post office (1.5 miles) and to the new, most direct road to Randsburg along the Southern Sierras power line. (See mile 44.0 of log on p. 132.)
- 52.9 Road forks. Continue northwest on left-hand road.
- 53.4 Intersection with north-south and east-west roads. Geological Survey sign. Road from south is direct route to Hawes (see left-hand column). Road to right (east) leads to Oro Grande. Continue north, setting speedometer to 46.0 to agree with log of the shorter route.

47.1 Cross a road leading diagonally northwest.

49.6 A faint road branches to left (northwest).

51.0 House on left. Road bends slightly to right. From here the road runs a short distance from edge of upland above river. Roads on left should be avoided.

- 53.1 Road comes in on left (southwest).
 55.5 Faint road leads to left (northwest).
 56.2 House on right.
 57.2 Pass through gate into **Helendale ranch** and turn to right (east), then to left, past house.¹⁸ **Water** at ranch house. A road which is used very little is said to lead west from Helen to Lancaster. This road was not traversed by the writer, and nothing definite is known of it. It is probably very sandy in certain spots.
 57.5 Pass through gate and continue northeast across a road coming from south (right) at river ford near Helen station.
 59.9 Geological Survey sign. Branch road on right (northeast) goes along river bottom. This may be a direct road to Hinkley, but nothing is known about it. Main road turns to left and soon ascends to upland.
 72.0 Intersection of Barstow-Mojave road, south of Atchison, Topeka & Santa Fe Railway, 0.2 mile east of **Hawes** station. Geological Survey sign. **Water** at section houses. Road on right (east) along railroad leads to Hinkley, Barstow, and Nædles. (See mile 52.7 of log on p. 153.) Road on left (west) leads to Kramer, Randsburg, and Mojave. (See mile 21.8 of log on p. 151.) The log is not continued farther, and the reader is referred to the logs mentioned for the road along the railroad.

RANDBURG AND HINKLEY TO SAN BERNARDINO BY WAY OF HAWES AND HELENDALE RANCH.

[For log of road in opposite direction see p. 134.]

This road is now probably used but very little by travelers going between Randsburg and San Bernardino, since the new road along the power line was opened. (See p. 133.) It is used principally by persons having business in the vicinity of Hawes. The log is therefore begun at Hawes. Persons coming from Randsburg who desire to use this road should follow the log on page 133 to the Southern Sierras power line (mile 30.7) and from that point the log of the Mojave-Barstow road on page 153 to mile 52.5.

- 0.0 **Hawes** station. **Water** at section houses. Go east 0.2 mile.
 0.2 Road forks. Geological Survey sign. Turn to right (southwest). Road straight ahead along railroad leads to Hinkley and Barstow. (See mile 52.7 of log on p. 153.) Road on right (southeast) leads to Helendale ranch, Victorville, and San Bernardino. The traveler may also reach Victorville and San Bernardino by continuing east to Barstow, thence going south on the National Old Trails road, but by that route the distance is 34 miles longer than the direct road. Mileage is given by way of the right-hand road.
 12.6 Branch road comes in on left (northeast) along river bottom. Geological Survey sign. Turn south.
 15.1 A good road on left (south) leads to river ford. The ford is dangerous and should be avoided. Go through gate into **Helendale ranch** and continue past house, then turn to right.¹⁸ **Water** at ranch. Turn to the left (south) along the road to the river for about 0.2 mile, then turn west for about 0.2 mile, then south (right) along road emerging from gate.

¹⁸ When this road was traveled, the manager of the ranch planned to build a road east along the south line of the property to a road about 0.2 mile east, avoiding the necessity of passing through the ranch.

- 15.3 Go through gate out of ranch and south along fence. Avoid road leading west just outside of gate. This road is said to lead to Lancaster, but nothing is known about it. It is probably very sandy in places.
- 16.3 House on left.
- 17.0 Faint road comes in on left (from northwest).
- 19.4 Avoid branch road leading to right (southwest). Main road in this vicinity is leading along bluff of river valley.
- 21.5 House on right.
- 23.0 Faint road comes in on right (from northwest).
- 28.7 Cross a road leading diagonally northwest. Continue straight ahead (south).
- 30.6 Crossroads. Geological Survey sign. The road straight ahead (south) is the direct route to San Bernardino. The road branching diagonally to left (southeast) leads to Victorville, connecting with the National Old Trails road. The distance to San Bernardino is 7 miles longer by way of the latter route. No supplies except water are available on the direct route until San Bernardino is reached, except by a short side trip to Adelanto, and the traveler should take the longer route if he needs gasoline or other supplies. The log is given for both roads.

*Left-hand road (by way of
Victorville).*

- 30.6 Take road leading southeast.
- 31.1 Branch road comes in on left (north).
- 32.6 Roads intersect diagonally. The traveler may continue straight ahead (southeast) or he may turn to left (east), as both roads unite a short distance beyond. Road leading west goes to Adelanto post office.
- 33.2 (approximate) Roads unite and follow along fence, turning first to left through a gate, then to right, later bending to left of **Turner's ranch** house, where **water** may be obtained.
- 35.0 Road leads through gate and along river.
- 35.4 Road forks. Either branch may be followed, as both join the National Old Trails road in a short distance. Mileage is given for right branch.

*Right-hand road (direct
route).¹⁹*

- 30.6 Continue straight ahead (south).
- 32.1 Crossroads. Turn to right (west).
- 33.1 Crossroads. Turn to left (south). **Water**, gasoline, and groceries at **Adelanto post office**, 0.5 mile west. Road running west also leads to **El Mirage** post office. (See p. 141.)
- 38.1 Crossroads at **Dobie ranch**. Automobile Club sign. **Water** at ranch. Road to left (east) leads to Victorville, 7 miles (see mile 45.4 of log on p. 140); road to right (west) leads to Llano, Valyermo, Little Rock, Palmdale, and Lancaster (see mile 7.0 of log on p. 138). Continue straight ahead (south), avoiding branch roads.
- 40.3 Avoid branch road on right (southeast), which leads to **Phelan** post office.

¹⁹ The right-hand route for the next 17 miles was not traveled, and the log is based on the Hesperia topographic sheet and other maps. In this area many roads lead in various directions to homesteads, but it is believed that the traveler will have no difficulty in following the main road.

Left-hand road (by way of Victorville)—Contd.

35.8 Junction with National Old Trails road, 0.4 mile south of bridge over Mohave River. Automobile Club sign. Continue south on the National Old Trails road through Victorville (38.9 miles) to **San Bernardino** (84 miles), following the log from mile 216.7, on page 128.

Right-hand road (direct route)—Contd.

43.5 Crossroads. Continue south. Road to left (east) leads to **Hesperia** (5.5 miles). Road to right (west) leads to **Phelan** post office (about 10 miles).

45.2 Road comes in on left (from northeast). Bend slightly to right.

46.0 Branch road comes in on right (from northwest).

46.6 Branch road comes in on left (from northeast).

47.7 (approximate) Junction with National Old Trails road (on left). Continue south on this road to **San Bernardino** (76.5 miles), following log from mile 236.1, on page 129, for mileage from this point.

VICTORVILLE-PALMDALE.**VICTORVILLE TO PALMDALE (51 MILES).**

[For log of road in opposite direction see p. 139.]

A road leads westward from Victorville, by way of the Dobie ranch, to Llano, Valyermo, Little Rock, Palmdale, and other points in Antelope Valley. Lancaster is reached most easily by this road, although it may also be reached by a road by way of Adelanto and El Mirage. (See p. 140.) It is used not only for travel from Victorville to these points, but also by persons going from San Bernardino to the places mentioned. For travelers from San Bernardino the preferable route is to follow the San Bernardino-Randsburg road to the Dobie ranch (see pp. 131-132) and thence turn west on the Victorville-Palmdale road. This road is marked for most of the distance by signs erected by the Automobile Club of Southern California.

- 0.0 **Victorville** post office. Go southwest, passing schoolhouse on left on the outskirts of the town.
- 0.8 Road forks. Automobile Club sign. Right-hand road (leading west along section line) goes to Adelanto, **El Mirage**, and other settlements. (See p. 140.) Follow left-hand road for Phelan post office, Llano, and Palmdale.
- 1.6 Road forks. Automobile Club sign. Follow right-hand road due west along section line to Llano and Palmdale.
- 6.3 Crossroads. Continue west past substation of Southern Sierras Power Co.
- 7.0 Crossroads near **Dobie ranch**. Automobile Club sign. **Water** at ranch. Road south leads to Phelan post office and San Bernardino. (See mile 65.5 of log on p. 134.) Road north leads to Adelanto post office, Kramer, and Randsburg and to Hawes. (See mile 38.5 of log on p. 132.) Continue west. In the next 12 miles several homesteads are passed and a number of roads enter or diverge from the main road, but these should be avoided.

- 18.6 Crossroads. Automobile Club sign. Continue straight ahead (west). Road to left (south) leads to Phelan post office and San Bernardino.
- 20.0 Main road turns to left (southwest). A minor road goes to right (north of west).
- 21.0 Main road turns to right, due west, along section line.
- 22.2 Pass ranch house on left; sign marking boundary between San Bernardino and Los Angeles counties on yucca tree just beyond.
- 30.8 Intersection with north-south road. Automobile Club sign. Turn obliquely to right (northwest) on short-cut road (or go north on section line half a mile, then west). Road to south (left) leads to Valyermo post office, about 7 miles.
- 31.6 Turn to left (west) on section-line road at east end of Llano.
- 32.1 Llano. Post office on right. Water and usually gasoline and other supplies at small store. From Llano a road leads north to ranches connecting with other roads leading west to Lancaster, and with a road leading east to El Mirage, Adelanto, and Victorville. Continue west.
- 37.7 Road turns to right (due north) at ranch. Water from well at house.
- 38.2 Road turns to left (due west).
- 41.7 Road comes in on left (southeast) from Valyermo. Automobile Club sign.
- 42.2 Turn to right (north) at south end of Little Rock.
- 42.7 Little Rock. Post office at crossroads. Water, gasoline, and supplies. Leaving Little Rock turn to left and go west.
- 43.7 Road turns obliquely northwest just west of bridge over Little Rock Creek.
- 46.7 Road turns to right (north) on section line.
- 47.1 Crossroads. Turn to left (west) along section line. Several ranches in this vicinity where water may be obtained.
- 49.1 Crossroads. Turn to right (north).
- 50.1 Crossroads. Turn to left (west).
- 52.0 Crossroads. Turn to right (north) on concrete road along Southern Pacific Railroad.
- 52.4 Palmdale. Post office on right. Water, gasoline, supplies, hotel, and garage. From Palmdale road leads west to route between Los Angeles, San Francisco, and Bakersfield, by way of Tejon Pass (see p. 159), and north to Lancaster, Mojave, and points along the Midland Trail to Big Pine, Calif., Tonopah and Ely, Nev., and Salt Lake City, Utah. (See p. 158.)

PALMDALE TO VICTORVILLE (51 MILES).

[For log of road in opposite direction see p. 138.]

This road is used for travel from Palmdale and other points in Antelope Valley to Valyermo, Llano, Victorville, and San Bernardino. It is marked for most of the distance by signs erected by the Automobile Club of Southern California.

- 0.0 Palmdale. Post office on left of main street. Go south on concrete road on east side of railroad.
- 0.4 Crossroads. Turn to left (east), away from railroad.
- 2.3 Crossroads. Turn to right (south).
- 3.3 Crossroads. Turn to left (east).
- 5.3 Crossroads. Turn to right (south).

- 5.7 Road bends diagonally to left (southeast), away from section line.
- 8.7 Road turns east, crossing bridge over Little Rock Creek a short distance beyond.
- 9.7 Crossroads at **Little Rock**. Post office and store at left. **Water**, gasoline, oil, and supplies. Turn to right and go south.
- 10.2 Crossroads. Turn to left (east).
- 10.7 Avoid branch road to right (southeast), which leads to **Valyermo**, about 10 miles. Automobile Club sign. Continue east.
- 14.2 Crossroads. Turn to right (south).
- 14.7 Turn to left (east). **Water** at ranch house on right.
- 20.3 **Llano**. Post office on left. **Water** and usually gasoline and groceries at small store. Continue east. From Llano a road leads north to ranches, connecting with roads west to Lancaster and probably east to Victorville by way of Mirage "dry lake," but they are used principally only for local travel.
- 20.8 Turn diagonally to right (southeast), or if desired go east 0.5 mile and south 0.5 mile. Mileage is by former road.
- 21.6 Crossroads. Automobile Club sign. Go east on straight road. Road on right (south) leads to Valyermo post office.
- 30.2 Pass ranch house on right. Sign on tree just west of house marks boundary between San Bernardino and Los Angeles counties.
- 31.4 Road bends slightly to left (north of east).
- 32.4 Road bends to right (due east) along section line.
- 33.8 Crossroads. Automobile Club sign. Continue straight ahead (east). Road to right (south) leads to Phelan post office and San Bernardino. This is a short-cut road to San Bernardino, being nearly 20 miles shorter than the route by way of Dobie ranch. It was not traveled by the writer, and nothing is known as to its condition. It is probably well signposted. Unless gasoline, etc., can be obtained at Phelan post office, there is no supply place until Camp Cajon is reached, a distance of about 23 miles.
- 45.4 Crossroads near **Dobie ranch**. Automobile Club sign. **Water** at ranch. Road on right (south) leads to San Bernardino, 38 miles (see mile 65.5 of log on p. 134); road straight ahead (east) leads to Victorville; road on left (north) leads to Adelanto post office, Helendale ranch, Hawes, Kramer, and Randsburg (see mile 38.5 of log on p. 132). Mileage is given to Victorville.
- 46.1 Crossroads, substation of Southern Sierras Power Co. on right.
- 50.8 Branch road comes in on right from southwest. Automobile Club sign. Turn to left (northeast).
- 51.6 Road comes in on left (from west). Automobile Club sign.
- 52.4 **Victorville**. Post office on right. From Victorville the National Old Trails road leads south to San Bernardino and north to Barstow, Needles, and the Eastern States (see mile 219.8 of log on p. 128 and mile 45.1 of log on p. 120). A road leads southeast to Box S ranch, Lucerne Valley, Old Woman Spring, and Bear Valley. (See pp. 142, 145.)

VICTORVILLE TO ADELANTO AND EL MIRAGE POST OFFICES AND LANCASTER.

West of Victorville many homesteads are scattered over a large area. Roads have been made along nearly all section lines, and in some parts branch roads lead in various directions, each man following the shortest cut to his neighbor's ranch. Post offices have been established at small settlements known as Adelanto

and El Mirage, and the roads to these places are much traveled. From El Mirage Valley a road also leads westward to the east side of Antelope Valley and thence to Lancaster. The writer did not have an opportunity to make an accurate and complete log of the road, although the log for the first 20 miles is fairly detailed. Persons using this road should have no difficulty in following the proper roads, using the maps (Pls. IX, X) as a guide. The log is given in only one direction, as it is believed the road will be used principally for travel between Victorville, Adelanto, and El Mirage. Persons bound for Lancaster will find that the road by way of Llano and Palmdale is the one most traveled.

- 0.0 Victorville post office. Go southwest, passing schoolhouse on left on outskirts of the town.
- 0.8 Road forks. Automobile Club sign. Follow right-hand road for Adelanto and El Mirage. Left-hand road leads to Phelan post office, Llano, and Palmdale and is best route to Lancaster. (See p. 138.) Continue west on section-line road.
- 3.7 Road forks. Turn northwest, avoiding road to west parallel to telephone line.
- 5.9 Road forks. Follow right-hand road.
- 6.7 Road forks. Follow left-hand road:
- 6.9 Turn north on section line.
- 8.5 Crossroads. Turn left (west).
- 9.5 Crossroads. Continue west.
- 10.0 Adelanto. Post office on right. **Water**, gasoline, and groceries. Continue west.
- 10.3 Crossroads. Turn right (north).
- 10.8 Crossroads. Turn left (due west) avoiding road leading northwest along high voltage transmission line. The latter road leads to Kramer and Randsburg. (See mile 44.8 of log on p. 132.)
- 13.4 Intersection with diagonal southeast-northwest road. Turn right (northwest).
- 14.9 Road forks. Avoid road to right (north) and continue straight ahead (northwest).
- 16.0 Cross east-west road and continue straight ahead (northwest).
- 19.2 Southeast end of Mirage "dry lake." Continue on clay flat in a northwesterly direction, swinging around to west and turning south off the flat at about mile 21.0. Mileage from this point was not obtained accurately. On leaving the dry flat turn south for a short distance to well-marked crossroads and then turn west. **El Mirage** post office is about 1.5 miles west and 0.5 mile south of the crossroads.

The road from El Mirage to Lancaster was traveled under conditions that prevented the writer from obtaining an accurate log, but the following notes will be helpful. The road is apparently not used very often. In some places it is sandy, and in other places it may be nearly obliterated by cattle tracks. Ordinarily, however, there should be little difficulty in traveling it, except after windstorms.

From the crossroads at south side of lake, mile 21.0 above, continue westward for about 3.5 miles and turn north at jog in road for about 0.2 mile, thence west for about 0.5 mile to the **Charles ranch**, where **water** can be obtained. From this ranch a road is said to lead southwest and west to Wilsona post office, but no details of the road are known. This road as shown on the maps (Pls. IX and X) may not be correct. The direct road from the Charles ranch to Lancaster goes slightly north of west, uphill around

the southern point of a low granite mountain. On the west side of this mountain, about 2.5 miles from the Charles ranch, it turns in a westerly direction at a point where another road, apparently the one most used, turns northward. From this point the road to Lancaster is not everywhere very plain, being tramped over by cattle. It goes in a general westerly direction, striking for a gap between high rock hills at the northwest side of a nearly closed basin. Crossroads leading north or south should be avoided. About 9.5 or 10 miles from the Charles ranch a house (the **McGowan ranch**) is passed on the north side of the road, where water can be obtained. A short distance beyond this the road unites with one from the south and turns in a northerly direction, keeping close to the east foot of low rock hills. The road may be very sandy in places in the next mile, especially after windstorms. Beyond the end of the rock hills the road swings to the northwest and then west, about 3 miles from the McGowan ranch coming to a north-south road. The traveler should turn north on this road. About 1 mile north of the junction with the north-south road a road goes west along a section line. This is the most direct road to Lancaster, but it is said to be sandy. The sand can be avoided by continuing in a northerly or northwesterly direction to a road fork near two windmills, where the road bends nearly due west, farther on going straight west on a section line. It is said that the wells at the windmills are not reliable. After leaving the windmills the traveler should have no difficulty in following the road, as it passes numerous ranches and is one of the main traveled roads leading to Lancaster. The total distance from Victorville to Lancaster by way of Palmdale is about 55 miles, only 3 or 4 miles less than it is by way of Llano and Palmdale.

VICTORVILLE-LUCERNE VALLEY-BEAR LAKE.

VICTORVILLE TO LUCERNE VALLEY AND BEAR LAKE (49 MILES).

[For log of road in opposite direction see p. 144.]

The route between Victorville and Bear Lake, by way of the Box S and Cushenberry ranches, is used to a great extent by tourists from the mountain resorts. A great many persons go from Redlands or San Bernardino to the Bear Lake resorts by the Mill Creek or Crest routes (p. 130) and return by way of the desert route. The road is also used to reach points in Lucerne Valley and in the vicinity of Old Woman Spring. (See p. 145.) Signposts have been erected on the road between Victorville and Bear Lake by the Automobile Club of Southern California.

- 0.0 **Victorville.** Post office. Go southeast parallel to railroad.
- 0.3 Road forks. Left-hand road leads to Bear Valley. Right-hand road leads to ranches along Mohave River.
- 0.4 Cross bridge over Mohave River at Upper Narrows.
- 0.5 Road forks. Geological Survey sign. Road on right (east) up steep grade leads to Bear Lake; road to left (north) leads to Barstow and Daggett by way of Stoddard Well. (See p. 147.) In the next 20 miles many homesteads at which water may be obtained are passed and many roads encountered, but the main road is well marked.
- 1.0 Branch road leads to right (south). Bear Valley road continues east.
- 1.7 Branch road leads to left (northeast); main road bends slightly southeast.
- 2.0 Branch road leads to left (north of east). Beyond this the main road bends toward southeast.

- 6.8 Main road turns at right angles to left (east) and shortly beyond bears southeast; a branch road continues south.
- 8.0 Cross north-south road. In 1917 a road continued from here diagonally southeast, but this may be closed, the main road going due east.
- 9.0 Turn to right (south).
- 10.0 Turn to left (east) and shortly beyond to southeast.
- 11.5 Road comes in on right (west) just west of low granite knob (Deadman Point).
- 11.7 Old road continues southeast, main road leads due east, along section line.
- 13.2 Road turns southeast.
- 15.1 Branch road comes in on right (west) near Fifteenmile Point; main road bends east.
- 15.5 Branch road leads to right (southeast).
- 17.5 Road crosses "dry lake" flat.
- 18.7 Road forks at east side of "dry lake" flat. Geological Survey sign. Road on left (east) leads to Rabbit Spring, Lucerne Valley post office, and ranches in Lucerne Valley. Road on right (southeast) leads to Box S ranch, Old Woman Spring, and Bear Lake. Follow road on right.
- 22.0 **Box S ranch.** Water and usually gasoline obtainable.
- 22.1 Road forks. Geological Survey sign. Road on right (southeast) leads to Cushenberry ranch and Big Bear Lake; road on left (northeast) leads to Lucerne Valley post office; road straight ahead (east) leads to Old Woman Spring, Rock Corral, etc. (See p. 145.) Turn to right.
- 25.7 Branch road comes in on left (north) from Lucerne Valley post office.
- 27.9 **Box S Springs.** Water of fair quality from pipe line at trough on right side of road.
- 30.1 **Cushenberry ranch.** Good water and sometimes meals obtainable. From this point for several miles the road leads up Cushenberry Canyon, with grades up to 20 per cent. Drivers should watch for vehicles approaching from the opposite direction.
- 34.2 **Johnston ranch.** Water obtainable at trough at side of road.
- 35.1 Road forks. Left-hand road (southeast) leads to Bear Valley. Right-hand road is old road to Bear Valley, with steep grades. Follow left-hand road.
- 36.5 Road forks. Automobile Club sign. Road to right (south) leads to Bear Valley. A short distance beyond the road turns abruptly to the right and ascends the mountain side with a winding course.
- 38.5 Summit. Baldwin Lake in valley ahead. Road follows around north end of lake.
- 39.3 Road forks. Bear Lake road leads to left around edge of lake.
- 43.2 Road intersection. Automobile Club sign. Road on left (south) leads to Pine Knot post office and resorts on south side of Bear Lake, and to Redlands by way of Mill Creek road. Turn south. Road straight ahead leads to resorts on the north side of the valley, and to Little Bear Lake, Arrowhead Hot Springs, and San Bernardino, by way of the Crest route. (See p. 130.)
- 43.7 Road forks, south side of valley. Road on right (west) leads to Pine Knot post office, to several resorts, and to Redlands. Numerous signs guide the traveler.
- 48.7 **Pine Knot** post office. Gasoline and general supplies. From Pine Knot a road goes west and southwest to Seven Oaks, Forest Home, and other resorts, and to Redlands by way of the Mill Creek road. (See p. 130.)

BEAR LAKE TO LUCERNE VALLEY AND VICTORVILLE (49 MILES).

[For log of road in opposite direction see p. 142.]

This route is used to a considerable extent by tourists from the Bear Valley resorts. Many persons go from Redlands or San Bernardino to the resorts by the Mill Creek or Crest routes. These roads are narrow and winding in the mountains, requiring careful driving, and for this reason many people prefer to return to San Bernardino by way of the desert route to Victorville, thence going south over Cajon Summit on the National Old Trails road. Signposts have been erected on this road between Victorville and Bear Lake by the Automobile Club of Southern California.

- 0.0 **Pine Knot** post office. South side of Bear Lake. Go eastward along south side of Bear Lake.
- 5.0 Road forks. Turn to left (north) across lowland between Bear Lake (on left) and Baldwin Lake.
- 5.5 Road forks. Automobile Club sign. Road on left (west) leads to San Bernardino, by way of the Crest route, and to numerous resorts. (See p. 130.) Road on right (east) leads to Victorville. Some distance beyond the forks it runs along the edge of Baldwin Lake.
- 9.4 Road forks. Take road on right which continues around east side of Baldwin Lake but later turns to left (east) away from the lake.
- 10.2 Cross summit of mountain and descend over winding road. At foot of mountain (about mile 12.0) road makes a sharp turn to left (north).
- 12.2 Branch road comes in on right from south. Automobile Club sign. Turn northwest in valley.
- 13.6 Branch road comes in on left.
- 14.5 **Johnston ranch**. Water at trough at side of road. Beyond Johnston ranch the road for several miles descends Cushenberry Canyon, with grades as steep as 20 per cent. Drivers should watch for vehicles approaching in the opposite direction.
- 18.6 **Cushenberry ranch**. Water and sometimes meals are obtainable.
- 20.8 **Box S Spring**. Water from pipe line at trough on left side of road.
- 23.0 Branch road on right (north) leads to Lucerne Valley post office. Continue northwest on left-hand road.
- 26.6 Road junction at east end of Box S ranch. Geological Survey sign. Road on east (right) comes from Old Woman Spring. (See p. 145.) Turn west on straight road.
- 26.7 **Box S ranch**. Water and usually also gasoline are obtainable. Continue west, turning northwest at about mile 28.7.
- 30.0 East side of "dry lake" flat. Road comes in on right (east) from Lucerne Valley post office. Geological Survey sign. Go west across lake flat on graded road.
- 33.2 Branch road comes in on left.
- 33.6 Faint road branches to left. Automobile Club sign. Main road bends to right (northwest).
- 35.5 Road turns west (to left) along section line.
- 37.2 A short distance west of low granite knob (Deadman Point) main road bends to right (northwest). Branch road continues west.
- 38.7 Crossroads. Turn to right (north).
- 39.7 Crossroads. Turn to left (west).
- 40.7 Road turns diagonally to right (northwest), following an irregular course for several miles in a general northwesterly direction.

- 41.9 Branch road comes in on left (south).
 46.7 Branch road comes in on right.
 47.0 Branch road comes in on right.
 47.7 Road comes in on left (south). A short distance beyond the road ascends a granite hill, leading through a narrow pass.
 48.2 Road junction at foot of hill. Geological Survey and Automobile Club signs. Road coming in on right is short cut to Barstow and Daggett by way of Sidewinder and Stoddard wells. It passes through unsettled country and is not recommended to tourists. (See p. 147.) Main road bends to left, crossing bridge over Mohave River.
 48.7 Victorville. Post office on left. Good hotel, garages, and general supplies. From Victorville the National Old Trails road leads south to San Bernardino and north to Barstow, Needles, and the eastern States. (See pp. 120, 128.) Roads also lead west to Llano, Valyermo, Palmdale, and Lancaster (see p. 138), and north to Kramer, Atolia, and Randsburg (see pp. 135, 141).

VICTORVILLE TO OLD WOMAN SPRING, ROCK CORRAL, ETC.

This road is the same as the one between Victorville and Bear Valley as far as Box S ranch (22 miles). From Box S ranch the road described in this log continues east to Old Woman Spring, and two branches continue from there east and southeast, the latter leading beyond Rock Corral. The road is very little used, except that it serves several ranches lying within a few miles east of Box S ranch. Several branch roads lead east and northeast from Old Woman Spring, but these are now practically abandoned and impassable because of heavy sand. The log of this road is given in only one direction.

- 0.0 Victorville post office. Follow log of Victorville-Bear Valley road on page 142 to mile 22.1.
 22.1 Road forks. East end of Box S ranch. Geological Survey and Automobile Club signs. Continue straight ahead (east) for Old Woman Spring and Rock Corral. Road on right (southeast) leads to Cushenberry ranch and Bear Valley.
 23.0 Avoid branch road on right.
 24.2 Crossroads. Continue east.
 25.2 Crossroads. Continue east. In December, 1917, water was obtainable from a pump near roadside at house on left.
 27.4 Road comes in on left. Main road bends to right (south of east). East of this point the road is very sandy in places, especially after wind storms.
 35.3 Road forks. Geological Survey sign. Road on right (south) leads to Old Woman Spring and Rock Corral. Road on left (east) along section line leads to several ranches, and by a very sandy road to Means Well and other points. The log is given for both branches.

Left-hand road.

- 36.8 Old road leads to left (north of east). This possibly leads to Means Well, with branch roads forking from it, and is probably very sandy.

Right-hand road.

- 35.4 Road forks. Branch to left leads to Old Woman Spring. Branch on right leads to an old ranch house 0.5 mile south, where good water may

Left-hand road—Continued.

- 37.8 Road comes in on right (south-west) from Old Woman Spring. Faint tracks continue northeast. In the next 4 miles several ranch houses are passed, with drilled wells at some of them, but in February, 1918, no one was living in any of these houses, and there was no way to obtain water at any of the wells.
- 41.7 Branch road turns north. This is sandy. It may lead to other roads which go east to Means Well.
- 42.2 End of east-west road. A road turns north to a well.
- 42.9 Well with windmill. **Water.** It is probable that tracks lead from here northeastward to a pass across a low mountain on the east to Means Well. At the time this well was visited cattle tracks had obliterated any such road. A road is said to lead to Means Well, but it is reported to be exceedingly sandy and practically impassable for automobiles. Coming from the east, the road is said to be very sandy on a heavy grade, so that even though one may go east on it, he will have more difficulty in returning. Several roads are shown leading farther east to Ames Well, Surprise Spring, and Mesquite Spring, but these are generally reported to be impassable for automobiles because of heavy sand in places. Surprise Spring is reported to be accessible from Warrens Well, and Mesquite Spring may be reached from Twenty-nine Palms. (See pp. 245, 248.)

Right-hand road—Continued.

- be obtained at **Cottonwood Spring** from a tunnel in hill back of house. A road leads from the spring back to the direct road to Old Woman Spring.
- 37.2 **Old Woman Spring.** Water of good quality obtainable from tunnel in hillside. Road leads west of ranch house, turns to left at end of fence, and forks a short distance beyond fence. Left branch leads along fence to corner of irrigated field and thence northeast to the road which branches at mile 35.3. (See left column, mile 37.8.) Right branch leads southeast to Rock Corral and other points. A road originally led almost due south from the ranch, through a narrow pass in a lava hill back of the ranch, up Rattlesnake Canyon, but it is now impassable for automobiles. Log is given for road to Rock Corral. In the next several miles the road may be faint in places, but it is generally good, except that in one or two places large boulders form high centers, and care should be taken that they do not strike the underframe of the car.
- 43.9 Road forks. Geological Survey sign. Road on right leads up alluvial slope, crossing a wash to **Rock Corral**, at mile 47.1. **Water** is obtainable in the corral at a pipe, which leads to a spring about 0.5 mile up a canyon to the south. The main road continues east.

Right-hand road—Continued.

46.9 Road comes in on right from Rock Corral and continues southeast from this point but was not traversed by the writer. It is said that about 6 miles southeast of this place the road forks, the left branch leading to **Richs Well**, about 3 miles distant, and the right branch leading to Pipes Wash, where water can be obtained. Whether the road is passable for automobiles is not known, but it is used occasionally by wagons. The area east and south of Pipes Wash is more easily reached from Banning, in San Gorgonio Pass. (See pp. 243-248.)

VICTORVILLE-BARSTOW-DAGGETT (BY WAY OF STODDARD WELL).**VICTORVILLE TO BARSTOW (35 MILES) AND DAGGETT (37 MILES).**

[For log of road in opposite direction see p. 148.]

This route is a short cut to Barstow and Daggett, the distance to the former place being 2.8 miles less and to the latter place 9.8 miles less than over the National Old Trails road by way of Oro Grande and Helen. The road is fully as good if not better than the main road, although it is somewhat more hilly. It leads, however, through unsettled country for most of the distance, and for this reason it is not recommended to tourists. It is used mostly by persons who are well acquainted with the region.

- 0.0 **Victorville** post office. Go southeast, parallel to railroad.
- 0.3 Road forks; left-hand road leads to Stoddard Well, Barstow, and Daggett, and to Bear Valley.
- 0.4 Cross bridge over Mohave River at the Upper Narrows.
- 0.5 Road forks. Geological Survey sign. Follow road on left (north) for Stoddard Well, Barstow, and Daggett. Road on right leads to Box S ranch and Bear Valley. (See p. 142.)
- 2.7 Road turns to right, up a branch valley, away from Mohave River.
- 5.1 Geological Survey sign. Branch road on left leads nearly north. Main road continues northeastward up wash.
- 6.1 Main road turns to left (northeast); branch road continues straight ahead (east).
- 6.2 Geological Survey sign. Branch road on left leads north.
- 6.8 Branch road leads east to ranches.
- 8.0 Irregular crossroads; main road continues northeast.

- 8.2 Branch road on right (east) leads to ranch.
- 9.1 **Sidewinder Well.** Geological Survey sign. Water obtainable from well by means of a hand pump. Main road bends to right (east); cross-road leads north and south.
- 13.3 Road forks. Geological Survey sign. Road on left (northeast), up hillside to low pass, leads to Stoddard Well, Daggett, and Barstow.
- 17.1 Road comes in on right (southeast) from Lucerne Valley, Box S ranch, and Bear Valley. (See p. 150.) Geological Survey sign.
- 19.2 **Stoddard Well.** Water at tank on left.
- 19.6 Geological Survey sign. Branch road on right (east) leads to Ord Mountain.
- 21.6. Road forks. Left-hand road leads to Barstow; right-hand road leads to Daggett. Mileage is given to both places.

Left-hand road to Barstow.

- 21.6 Road forks. Follow road on left. This road crosses several ranges of hills in the next few miles.
- 33.8 Turn to left (west) at south end of Barstow. (See fig. 3, p. 121, for sketch of roads leading into Barstow.)
- 33.9 Turn to right (north) at cross-roads.
- 34.1 Turn to left (west) 200 feet south of railroad track.
- 34.4 Turn to right (north) and cross railroad tracks. On north side of tracks turn to right and go east on main street of Barstow.
- 34.7 **Barstow**, post office. (See p. 127 for routes diverging from Barstow.)

Right-hand road to Daggett.

- 21.6 Road forks. Follow road on right.
- 28.0 Cross low pass through hills.
- 34.4 Junction with National Old Trails road near Atchison, Topeka & Santa Fe Railway. (See pp. 121, 127.)
- 36.4 West end of Daggett. Cross north side of railroad and turn east along tracks.
- 36.7 **Daggett.** (See p. 121 for routes diverging from Daggett.)

DAGGETT AND BARSTOW TO VICTORVILLE (37 MILES).

[For log of road in opposite direction see p. 147.]

This road is a short cut from Daggett and Barstow to Victorville, the distance by this road being 9.8 miles less from Daggett and 2.8 miles less from Barstow than by the National Old Trails road through Oro Grande and Helen. The road is fully as good if not better than the main road, although it is somewhat more hilly. It leads, however, through unsettled country for most of the distance, and for this reason it is not recommended to tourists. It is used mostly by persons who are well acquainted with the region. The log of the road from Daggett is first given, and following it is the log for the road from Barstow to the junction with the road from Daggett, 15.1 miles from Daggett or 13.1 miles from Barstow.

DAGGETT TO VICTORVILLE.

- 0.0 **Daggett.** North side of railroad opposite railroad station. Go west.
- 0.3 Cross to south side of railroad and turn west along it.
- 2.3 Road forks. Automobile Club sign. Right branch is National Old Trails road to Victorville by way of Barstow. Left-hand road is short cut to Victorville by way of Stoddard Well, but on this route no supplies are obtainable until Victorville is reached. Log is given for left-hand road.
- 8.9 Road leads up a small canyon, crossing a low divide a short distance beyond, and thence leads across a wide valley.
- 15.1 Road from Barstow comes in on right (from north). Geological Survey sign. Continue south.
- 17.1 Branch road comes in on left (east) from Ord Mountain. Geological Survey sign.
- 17.5 **Stoddard Well.** Water at tank on right side of road.
- 19.6 Road forks. Geological Survey sign. Take right fork to Victorville. Left fork leads to Box S ranch, Old Woman Spring, and Bear Valley. (See p. 150.) No supplies obtainable on the latter road (except that gasoline may possibly be obtained at Box S ranch), so that unless the traveler has plenty of supplies he should go to Victorville. From this fork the road to Victorville leads across a small valley and through a low pass.
- 23.4 Branch road comes in on left (from east). Geological Survey sign. Road leads westward.
- 27.6 Crossroads. **Sidewinder Well** on right. Geological Survey sign. Water obtainable from well by a hand pump. Road bends to left (southwest).
- 28.5 Branch road comes in on left, from ranch house.
- 28.7 Irregular crossroads. Main road continues southwest.
- 29.9 Branch road comes in on left.
- 30.5 Branch road comes in on right (from north). Geological Survey sign.
- 30.6 Branch road comes in on left.
- 31.6 Branch road comes in on right (from north). Geological Survey sign.
- 34.0 Road bends to left (south) along west foot of granite ridge.
- 36.2 Road junction. Geological Survey and Automobile Club signs. Road to left (east up hill) leads to Box S ranch, Old Woman Spring, Lucerne Valley, and Bear Valley. (See pp. 142, 145.) Immediately beyond road junction cross bridge over Mohave River.
- 36.7 **Victorville.** Post office on left. Good hotels, garages, and general supplies. From Victorville the National Old Trails road leads south to San Bernardino. (See p. 128.) Roads also lead west to Llano, Valyermo, Palmdale, and Lancaster (see pp. 138, 140). and north to Kramer and Randsburg (see pp. 135, 141).

BARSTOW TO VICTORVILLE.

- 0.0 **Barstow.** Post office on right. Go west on main street of Barstow. (See fig. 3, p. 121, for diagram of roads leading from Barstow.)
- 0.2 Branch road on right (north) leads across tracks to Mojave, Randsburg, Ballarat, Silver Lake, etc. (See pp. 150, 181, and 191.) Continue west, a short distance beyond turning to left (south) and crossing several railroad tracks. On south side of tracks turn to left.
- 0.6 Turn to right (south).

- 0.8 Crossroads, south end of Barstow. Automobile Club sign. Road on right (west) is National Old Trails road to Victorville and San Bernardino. (See mile 182.0 of log on p. 128.) Road on left (east) leads to Victorville by way of Stoddard Well. Mileage is given in this log by the latter road. Turn to left.
- 0.9 Turn to right, a short distance beyond turn ascending hill.
- 13.1 Road from Daggett to Victorville comes in on left (from northeast). Geological Survey sign. Mileage from this point is given in log of Daggett-Victorville road on page 149. Set speedometer to 15.1, as given in the above log, and follow it.

BARSTOW AND DAGGETT TO BOX S RANCH AND BEAR VALLEY.

The journey from Barstow or Daggett to Bear Valley can be made by way of Box S ranch, without going to Victorville, by following the road from the two towns to Stoddard Well and turning off from this road 2 miles south of Stoddard Well. From this turn-off the road leads southeast, over a broad pass, and south across the "dry lake" flat north of Box S ranch. The road between these two points was not traversed by the writer and no log is given for it, but the following brief notes may be given.

A traveler from Daggett should follow the log on page 149 and one from Barstow should follow the log just below it to mile 19.6. At this point he should take the branch road to the left and continue on this road in a general southeasterly direction toward Lucerne Valley, marked by a "dry lake" flat. A road comes in on the right at about mile 24.6. Near mile 27.0 the road turns more to the south, and at about mile 33.0 it goes south along a section line across the clay flat, coming to an east-west road near Box S ranch at about mile 41.0. In wet weather it will be necessary to go around the clay flat. There are a number of homesteads in this valley, and roads lead in various directions, so that the traveler may become confused. Box S ranch is about 1.5 miles east of the southernmost point of the mountains that lie to the west of the road which the traveler follows, and it is marked by a grove of trees around it. A smaller clump of trees at Rabbit Springs 1 mile northwest of the ranch should not be mistaken for the Box S place. Water is obtainable at Box S ranch and other places. From Box S a road leads southeast to Bear Valley (see mile 22.1 of log on p. 143) and a road leads east to Old Woman Spring and other points (see p. 145). No description is given for the road from Box S to Barstow and Daggett.

BARSTOW-KRAMER-MOJAVE.

BARSTOW TO KRAMER, RANDSBURG, AND MOJAVE (75 MILES).

[For log of road in opposite direction see p. 152.]

This route is used by travelers going from Barstow to Hinkley, Kramer, Atolia, Randsburg, Lancaster, and Mojave, and to Bakersfield and San Francisco by way of Tehachapi Pass. The roads to Mojave and to Randsburg are marked by signs erected by the Automobile Club of Southern California.

- 0.0 **Barstow.** Post office on right. Go west on main street. (See fig. 3, p. 121, for diagram of roads leading out of Barstow.)
- 0.2 Turn to right (north) and cross railroad tracks. On north side of track turn to right (east).
- 0.6 Turn to left (north) and cross bridge over Mohave River.

- 1.0 Turn to left (west).
- 1.1 Turn to right (north).
- 1.5 Road intersection. Road to left (west) leads to Hinkley, Kramer, Randsburg, Mojave, etc.; road straight ahead (north) leads to Crutts post office, Ballarat, and Randsburg by way of Copper City (see p. 181) and to Silver Lake, Goodsprings, and points in Death Valley (see p. 191). Turn to left. Automobile Club sign.
- 5.5 Avoid road to right (north).
- 6.2 **Water at pump** on right side of road.
- 6.6 Branch road leads to right (north). Main road follows railroad track.
- 8.4 Crossroads. Continue parallel to railroad.
- 10.4 Crossroads. Continue parallel to railroad.
- 11.4 Crossroads, near schoolhouse. Continue parallel to railroad.
- 12.2 **Hinkley. Water, gasoline, and food supplies.** Leaving Hinkley, turn right (northwest) away from railroad.
- 12.8 Turn to left (west) along fence. Branch road straight ahead (north) leads to Black ranch. (See p. 154.) Old road comes in on right (east).
- 12.9 Branch road leads to right (northwest).
- 14.8 Turn to left (south) across railroad and immediately turn to right (west) parallel to track. Automobile Club signs. On north side of track an old road continues west. On south side a road comes in on left (east) from Hinkley.
- 17.1 **Bads siding.**
- 21.8 Road comes in on left (southeast) from Victorville and San Bernardino. (See p. 136.) Geological Survey sign. Continue west.
- 22.0 **Hawes station. Water** at section houses.
- 27.7 **Jimgrey siding.**
- 32.2 Pass under electric-power transmission line. A road leading southeast along the line is the most direct route from Randsburg to San Bernardino. (See mile 30.7 of log on p. 134.)
- 35.7 Railroad crossing, **Kramer. Water, gasoline, and groceries** at a small store, and meals and sleeping accommodations for a few persons. Road straight ahead (west) parallel to track leads to Muroc, Mojave, Tehachapi Pass, etc. Road to right (north) leads to Atolia, Randsburg, Trona, etc. (See mile 75.8 of log on p. 132.) In wet weather the road to Mojave may be impassable across Rogers "Dry Lake," and if so to reach Muroc or Mojave it is necessary to go north on the Randsburg road to a point 4.5 miles south of Atolia, and thence turn southwest to Mojave. (See p. 166.) Inquiry should be made at the depot in regard to the condition of the road across Rogers "Dry Lake." Continue west on south side of track.
- 44.4 **Rich station. Water** at section houses.
- 46.3 East edge of Rogers "Dry Lake." This may be impassable in wet weather.
- 49.0 Solon siding (on "dry lake" flat).
- 53.2 West edge of Rogers "Dry Lake."
- 53.6 **Muroc. Water, gasoline, and food supplies.** From Muroc roads lead south to Buckhorn Springs, Lancaster, Palmdale, and Los Angeles (see p. 155), and north to near-by homesteads. The road from Muroc to Mojave was not traveled, and the log given for this distance is only approximate. The road follows the Atchison, Topeka & Santa Fe Railway for most of the distance.

- 54.0 Avoid road to left (south), which leads to Buckhorn Springs and Lancaster. Beyond this the road swings to the left and then to the right, keeping within a few hundred feet of the railroad. It is over clay soil which is muddy in wet weather and badly rutted when dry.
- 60.1 (approximate) Turn to right and cross to north side of railroad.
- 63.5 (approximate) Turn to left and cross to south side of railroad at Bissell station. Water is usually obtainable at railroad section house. From Bissell a road goes due west, leaving the railroad, to Gloster siding on the Southern Pacific Railroad. Road to Mojave continues along Atchison, Topeka & Santa Fe tracks.
- 69.2 (approximate) Pass Gamba siding.
- 71.2 (approximate) Cross to north side of railroad.
- 74.5 (approximate) **Mojave.** Hotels, garages, and general supplies. From Mojave roads go south to Lancaster, Palmdale, and Los Angeles (see p. 157); west to Bakersfield and San Francisco through Tehachapi Pass (see p. 159); north to Independence, Big Pine, Goldfield, Tonopah, Ely, and Salt Lake City by way of the Midland Trail and Lincoln Highway (see p. 159); and northeast to Randsburg and Trona by way of Cantil (see p. 164) or Atolia (see p. 165).

MOJAVE TO KRAMER AND BARSTOW (75 MILES).

[For log in opposite direction see p. 150.]

This road is used by travelers going from Mojave to Kramer, Barstow, and points east thereof on the National Old Trails road. Some persons come from San Francisco and Bakersfield to Mojave through Tehachapi Pass and continue eastward on the road described below. The road between Mojave and Bissell was not traveled by the writer, and the log for that stretch is only approximate. For most of the distance it lies within a few hundred feet of the Atchison, Topeka & Santa Fe Railway, and it is marked by signposts erected by the Automobile Club of Southern California. East of Muroc the road leads across a "dry lake" for several miles, which in wet weather is impassable. Therefore, in the rainy season, before leaving Mojave it may be well to inquire of the railroad agent or at some garage as to the condition of the clay flat. If it is impassable, the traveler should follow the road which leads northeast from Mojave to Atolia and Randsburg (see p. 163) to the road from Randsburg to Kramer, and turn south on the latter road to Kramer, there joining the regular Mojave-Barstow road. This detour is about 26 miles longer than the regular road.

- 0.0 **Mojave.** Go east along north side of railroad. As this part of the road was not traveled by the writer definite directions can not be given. Local inquiry should be made in regard to the first few miles.
- 3.0 (approximate) Cross to south side of railroad and turn east along it.
- 5.3 (approximate) Pass Gamba siding.
- 11.0 Cross to north side of railroad at Bissell station. Water is usually obtainable at railroad section houses. Continues east along the track.
- 14.4 Cross to south side of railroad and turn east along it. For the next several miles the road is several hundred feet south of the railroad. The soil is clay, very muddy in wet weather and badly rutted when dry.
- 20.5 Road comes in on right from Buckhorn Springs and Lancaster.
- 20.9 **Muroc.** Water, gasoline, and food supplies. From Muroc a road leads south to Buckhorn Springs, Lancaster, Palmdale, and Los Angeles.

- (See p. 155). East of Muroc the road leads across Rogers "Dry Lake" for several miles, and in wet weather it can not be used. It is then necessary to go northeast for nearly 20 miles to a road leading from Mojave to Atolla, thence east of north along it to a road leading from Randsburg to Kramer, and south on that road to Kramer, where it joins with the regular Mojave-Barstow road. In dry weather continue east along south side of railroad.
- 21.8 West edge of "dry lake" flat. Go east across flat.
 - 25.5 Solon siding (on "dry lake" flat).
 - 28.2 East edge of clay flat.
 - 30.1 Rich station. Water at section houses.
 - 33.8 Kramer. Railroad crossing. Automobile Club sign. Water, gasoline, a small supply of groceries, meals, and sleeping accommodations for a few persons. Road to left (north) across railroad leads to Atolla and Randsburg. (See mile 75.8 of log on p. 132.) Continue straight ahead (east) along south side of railroad.
 - 41.8 Pass under high-power electric-transmission line. A road leading south-east parallel to the power line is the direct route to San Bernardino. (See mile 30.7 of log on p. 134.)
 - 46.8 Jimgrey siding.
 - 52.5 Hawes station. Water at section houses.
 - 52.7 Road forks. Geological Survey sign. Road to right (southeast) leads to Victorville and San Bernardino by way of Helendale ranch. (See p. 136.)
 - 57.4 Eads siding.
 - 59.7 Cross to north side of railroad and turn east along it. Automobile Club sign. Avoid road along south side of railroad.
 - 61.6 Road comes in on left (northwest).
 - 61.7 At end of fence bend to right (southeast) toward Hinkley station.
 - 62.3 Hinkley station. Water, gasoline, oil, and food supplies. Continue east along railroad.
 - 63.1 Crossroads, schoolhouse on left. Continue east parallel to railroad.
 - 64.1 Crossroads. Continue east.
 - 66.1 Crossroads. Continue east.
 - 67.9 Branch road comes in on left (northwest).
 - 68.3 Water at pump on left side of road.
 - 69.0 Branch road comes in on left.
 - 73.0 Road intersection. Automobile Club sign. Turn to right (south). Road on left (north) leads to Crutts post office, Ballarat, and Randsburg by way of Copper City (see p. 181), and to Silver Lake, Goodsprings, and points in Death Valley (see p. 191).
 - 73.4 Turn to left (east).
 - 73.5 Turn to right (south), crossing bridge over Mohave River a short distance beyond.
 - 73.9 Turn to right (west) along north side of station at Barstow. (See fig. 3, p. 121, for diagram of roads leading into Barstow.)
 - 74.2 Turn to left (south) and cross railroad tracks. On south side of tracks turn to left (east) along main street of Barstow.
 - 74.5 Barstow. Post office on left. Good hotel and garage accommodations and general supplies. From Barstow the National Old Trails road leads east to Ludlow, Needles, and the Eastern States, and south to Victorville, San Bernardino, and Los Angeles. (See pp. 121, 127.)

HINKLEY TO ATOLIA AND ROADS IN HARPER VALLEY.

From Hinkley roads lead north to Black's ranch and a number of other homesteads in Harper Valley. One of the roads leads northwest from the station for 0.7 mile and then turns northward where the main road turns west. It crosses over a series of hills north of the town and drops down a fairly steep grade to a clay flat. On the clay flat, about 4 miles from Hinkley a road branches to the left (northwest) to the P. E. McDonald ranch (0.3 mile), where water is obtainable from two flowing wells. The main road continues north to Black's ranch, where water is obtainable from several flowing wells. Black's ranch may also be reached from Hinkley by a road that leads northeast and then north, going east of the hills that lie north of the town instead of crossing over them. This road also leads to several other ranches.

From Black's ranch roads lead in several directions. These roads are not very plain at the ranch, usually being nearly obliterated by cattle tracks. One road leads southwest to ranches. Another road leads northwest across Harper "Dry Lake" to the McDonald ranch, where water can probably be obtained. (This is not the same as the P. E. McDonald ranch mentioned above.) From the McDonald ranch the road continues northwest through a pass east of Fremont Peak to Atolia. This route from Hinkley to Atolia was not traveled by the writer, and no definite log can be given for it. It is not used very much. A person going from Hinkley northwest will probably not have any difficulty following the road, but it is reported that near the northwest end of Harper Lake there are so many tracks that one coming from the opposite direction may become confused.

Several other roads lead to different parts of Harper Valley. A road leading approximately north from the valley, through Black Canyon on the west side of Black and Opal mountains, is reported to be impassable in the canyon. A road leading east from Black's ranch to Coolgardie camp is probably passable, although it is said that heavy sand is encountered.

LANCASTER-MUROC.**LANCASTER TO MUROC (30 MILES).**

[For log in opposite direction see p. 155.]

East of Lancaster there is an area of considerable size which is well settled. This is a part of the Antelope Valley,²⁰ where a large acreage is being irrigated from wells, the water table standing at a slight depth and in some cases flowing wells being obtained. Roads have been laid out on section lines in this region. From the northeast edge of the settled area, near Redman School, a road leads north to Buckhorn Springs and thence to Muroc. This road is used occasionally by persons going between Lancaster and near-by points to the Barstow region. Some persons traveling from Lancaster to Muroc go east from the former town about half a mile, thence north for about 6 miles to a road that leads northeast to Rosamond "Dry Lake," and thence eastward across this clay flat and Buckhorn "Dry Lake" to Buckhorn Springs. It is reported that much sand is encountered between the two "dry lake" flats. This can be avoided by going east and north along section-line roads by way of Redman School and turning north a mile east of that place. A short stretch of sand is encountered on this road

²⁰ Johnson, H. R., Water resources of Antelope Valley, Calif.: U. S. Geol. Survey Water-Supply Paper 278, 1911. Recent developments in the valley will be described in a short report by David G. Thompson, now in preparation.

on the south side of Buckhorn "Dry Lake." The route by way of Rosamond "Dry Lake" was not traversed by the writer, and the log is given only for the road by way of Redman School. In the well-settled region the numerous cross-roads are not mentioned, only turning points being indicated.

0. 0 **Lancaster.** North end of railroad station. Go east.
0. 3 Turn to left (north) at schoolhouse.
0. 6 Turn to right (east) along section line.
7. 8 Turn to left (north).
8. 8 Turn to right (east); Roosevelt School on left.
10. 8 Turn to left (north).
14. 1 Turn to right (east); Redman School on right.
14. 9 Turn to left (north).
18. 9 Road forks. Turn slightly to right, avoiding the straight road due north, which is very sandy, but coming back to it at about mile 19.3.
19. 4 Southeast edge of clay flat. Turn to right (northeast) across small clay flat to Automobile Club sign, and thence go nearly due east to an old shack at Buckhorn Springs.
20. 1 **Buckhorn Springs**, a few feet north of shack on left side of road. **Good water.** Automobile Club sign. From the springs continue east for a short distance, then northeast. A short distance beyond this turn the road forks, one branch leading to the right, onto Rogers "Dry Lake," and the other to the left, continuing northeast a short distance west of the edge of the "lake" and later north. In dry weather the clay flat affords the best road to Muroc, but when it is muddy the traveler must follow the left branch along the west side of the lake flat. The latter road was not traversed, and no log is given for it. It reaches the Atchison, Topeka & Santa Fe Railway about a quarter of a mile west of Muroc. The distance by the left branch to Muroc from Lancaster is about 27 miles. The log is continued for the right branch.
22. 6 West edge of Rogers "Dry Lake." Go east on the "dry lake" to opening in abandoned road grade across the clay flat.
24. 2 Pass through elevated road grade at a break in the road embankment, and turn to left (northwest) across clay flat, clearing point of border at northwest edge of flat. The graded road leading north across the clay flat was built by Kern County, but in December, 1917, it was impassable, several culverts on the clay flat having been washed out. Continue in a general northerly direction along the west side of the clay flat. Road tracks continue east across the clay flat to Flowing Well (2.5 miles) and other points.
29. 6 (approximate) Turn to left (west) leaving clay flat a short distance south of Atchison, Topeka & Santa Fe Railway.
30. 0 **Muroc.** **Water**, gasoline, oil, and food supplies. From Muroc a road leads west of Mojave (see p. 151) and east to Kramer, Hinkley, and Barstow (see p. 152).

MUROC TO LANCASTER (30 MILES).

[For log in opposite direction see p. 154.]

This road is used occasionally by persons going from Barstow, Kramer, and Muroc southwest to Lancaster and Palmdale. For the first one-third of the route there are two optional roads. The traveler may go south on the clay flat of Rogers "Dry Lake" for about 7 miles and then turn southwest to Buckhorn

Springs. Good time can be made across the smooth hard clay flat. In wet weather, however, this route is impassable. The alternative route turns south from the railroad just west of the station at Muroc, continuing in that direction for about 3.5 miles, and then it turns southwest a short distance from the edge of the clay flat, joining the other road just before reaching Buckhorn Springs. The road that goes south to the west of the clay flat was continued across it on an elevated embankment, but in December, 1917, several culverts on the flat had been washed out and it was impassable. The log is given only for the road that leads south on the clay flat, as the other road was not traversed by the writer, and it is only approximate for the first 7 miles.

- 0.0 **Muroc.** South side of railroad, opposite station. Go east to "dry lake" flat.
- 0.4 Turn in a general southerly direction on clay flat, keeping far enough out from its edge to avoid the projecting points of the border.
- 3.9 (approximate) Turn to right (approximately southwest), where clay flat expands to west.
- 6.8 (approximate) Pass through opening in embankment of old road grade across flat and turn west. If the traveler goes far enough south he will probably strike tracks leading almost due east and west through one of the several breaks in the road embankment. Tracks lead across the clay flat in various directions, but the traveler should follow those that lead to the western point of a large embankment on the west, near the south end of the flat.
- 8.4 (approximate) West edge of clay flat. Continue in a southwesterly direction, uniting within a short distance with the optional road from Muroc, which comes in on the right.
- 10.0 (approximate) **Buckhorn Springs.** Good water at right of old shack on north side of road. Automobile Club sign. The mileage from Muroc to Buckhorn Springs is only approximate. It will probably vary with the course the traveler follows on the clay flat. From Buckhorn Springs go in a southwesterly direction across small clay patches.
- 10.7 Turn south, leaving clay flat. This is about 0.2 mile southwest of an Automobile Club sign. Shortly after leaving the clay flat turn slightly to left on a well-worn road, avoiding a very sandy stretch on the road that leads due south.
- 11.2 Return to north-south road. Continue due south.
- 15.2 Turn to right (west). From here to Lancaster the road leads through a more or less settled part of the Antelope Valley, on section-line roads. The numerous crossroads are not mentioned, only turning points being indicated. **Water** may be obtainable at frequent intervals.
- 16.0 Turn to left (south); Redman School on left.
- 19.2 Turn to right (west).
- 21.2 Turn to left (south); Roosevelt School on right.
- 22.2 Turn to right (west).
- 29.4 Turn to left (south).
- 29.7 Turn to right (west); school on left.
- 30.0 **Lancaster.** North end of railroad station. **Water**, gasoline, oil, supplies, garages, and hotels. From Lancaster roads lead south to Palmdale, San Bernardino, and Los Angeles, north to Mojave, and west to Bakersfield and San Francisco. (See p. 157.)

PALMDALE AND LANCASTER TO FAIRMONT, NEENACH, AND THE RIDGE ROUTE.

Travelers going from Antelope Valley to Bakersfield, San Francisco, and other points in northern California may go northwest across the valley to the Ridge route, by way of Fairmont and Neenach. For part of the distance there is a choice of several routes. Detailed mileage of these roads was not obtained, but they have all been marked with signs by the Automobile Club, and it is believed that with the general notes given below the traveler will have little difficulty in following the proper route. Water is obtainable at numerous ranches scattered along the road at distances of a few miles.

If the traveler starts from Palmdale, there are two possible routes. Both go north about half a mile from the station, turn west across the railroad, and continue west for about $1\frac{1}{2}$ miles to a road fork. Here one route turns to the right, leading partly on section-line roads and partly on roads cut across sections, to Del Sur and thence to Fairmont. The other route continues west a mile and then turns southwest into Leonis Valley, south of Portal Ridge. It leads northwestward up the valley to a point about a mile northwest of the Elizabeth Lake store and thence turns north across Portal Ridge. Just north of Portal Ridge is a fork. The traveler should take the left branch to Fairmont. **Water**, gasoline, and other supplies may be obtained at **Fairmont**.

There is not much choice between the two routes so far as distance is concerned. The exact mileage of each is not known, but from approximate measurements on the topographic map it is believed that the route by way of Leonis Valley is a mile or two shorter, especially because the other route for much of the distance follows section lines. The road conditions on both routes are usually very good, but in wet weather the road for a mile or two southeast of Del Sur is likely to be in bad condition, and the Leonis Valley route is then to be preferred.

From Fairmont the route leads west 2 miles, north half a mile, west 1 mile, and northwest about $1\frac{1}{2}$ miles to a road that runs west through almond groves near the old settlement Manzanita. This road leads west for 3 miles, north 1 mile, and west to Neenach, where gasoline and other supplies may be obtained. From Neenach the road leads west for about 4 miles and then turns southwestward up an open canyon, several miles farther on joining the Ridge route.

If the traveler starts from Lancaster, he may go west on a road that begins at the north edge of the town (known as the center road), or on another a mile farther north (known as the north road), each of them running due west to points within a few miles of Fairmont, where they turn off from section lines. In wet weather these roads may not be in good condition, and it may be advisable to go south to a road $3\frac{1}{2}$ miles south of Lancaster and thence west past Quartz Hill and northwest through Del Sur.

ROUTES BETWEEN MOJAVE AND LOS ANGELES.

Formerly the travel between Mojave and Los Angeles was divided between two routes, known as the Bouquet Canyon route and the Mint Canyon route. Recently, however, the Mint Canyon road has been paved for most of its length and it is now the one most used. The Mint Canyon road was traveled by the writer under circumstances that made it impossible to get an accurate log for some parts of the road. The route is well signposted, however, and the traveler should have little difficulty in following it. For this reason the following general notes are given for the road in one direction only, from Los Angeles to Mojave. A brief description is also given for the Bouquet Canyon route.

MINT CANYON ROUTE.

Leaving Los Angeles the traveler has a choice of routes to San Fernando. He may go northeast on Broadway across Los Angeles River and then turn northwest on San Fernando Boulevard and continue on this road with a very few turns through Burbank to San Fernando, or he may follow one of several boulevards to Hollywood and thence go on a paved road through Cahuenga Pass, past Universal City, the home of one of the large moving-picture corporations, and through Lankersheim to San Fernando. Maps published by the Automobile Club of Southern California show these roads in detail. The distance from Los Angeles to San Fernando is about 23 miles, depending on the starting point and the route followed. From San Fernando the road continues northwest, passing through the Newhall tunnel and the town of Newhall to Saugus, 34 miles from Los Angeles.

On the northern outskirts of Saugus is an important road junction. The road to the left is the Ridge route, a road recently opened, that leads to Bakersfield, San Francisco, and other points in the northern part of the State. This road has many sharp curves, and the speed limit on it for certain stretches is set at 15 miles per hour. The Bouquet Canyon route also follows this route for a short distance. Although the Bouquet Canyon road is not used so much now as formerly, it is probably in good shape for most of the year. The road to the right at this junction is the Mint Canyon route. In February, 1920, it was paved through to Lancaster except for two stretches, and these were practically completed. A stretch of several miles between Acton and Harold was still unpaved, work on the new road being delayed by litigation over the right of way. From Saugus to Harold the road follows a winding route through mountain canyons, with numerous grades, none of which, however, are steep. **Water**, gasoline, and other supplies may be obtained at several points. At **Palmdale**, about 72 miles from Los Angeles, all general supplies and good hotel accommodations are available. From Palmdale a road leads eastward to Little Rock, Valyermo, Llano, Victorville, and San Bernardino. (See p. 139.) A road also leads northwestward to Del Sur, Fairmont, Neenach, and the Ridge route. (See p. 157.)

From Palmdale the shortest route to Mojave leads northward along the Southern Pacific Railroad through Lancaster and Rosamond. The road is paved as far as **Lancaster**, 8 miles north of Palmdale. At this place all general supplies and good hotel accommodations are available. For a stretch of about 7 miles north of Lancaster the road is over low ground, and in very wet weather it may be so wet and muddy as to be practically impassable. Inquiry should be made at Lancaster in regard to the condition of this stretch of the road, and, if necessary, a detour can be made to the west. (See below.) Supplies and lodging can be obtained at **Rosamond**, 12 miles north of Lancaster. From Rosamond the road continues in a northerly direction along the west side of the railroad to **Mojave**. **Water** is obtainable at several ranch houses. A short distance north of Gloster station (7.3 miles north of Rosamond) a road turns east (going through gates) across the railroad to Bissel (7 miles), where it connects with a road from Mojave to Muroc, Kramer, Hinkley, and Barstow. (See mile 11.0 of log on p. 152.) The total distance from Los Angeles to Mojave by way of Palmdale, Lancaster, and Rosamond is about 105 miles.

If the stretch of road between Lancaster and Rosamond is so muddy as to be impassable or dangerous, it is necessary to detour to the west and go by way of Willow Springs. If the roads are not too bad, the traveler can go west on roads leading from Lancaster, but under some conditions even these roads are in very poor shape. Under such circumstances it is necessary to go west on

a road 3.5 miles south of Lancaster, past Quartz Hill, a distance of 6 miles, and then follow section-line roads northwest to **Del Sur**. From **Del Sur** a road leads north 13 miles to **Willow Springs**. Water, gasoline, and other supplies may be obtained at both of these places. About a mile north of **Willow Springs** the road forks, the branch on the right leading northeastward to **Mojave**. If the traveler knows that it is necessary to detour before leaving **Palmdale**, he can follow a road that strikes northwest to **Del Sur**, thereby saving some distance.

BOUQUET CANYON ROUTE.

The Bouquet Canyon route from Los Angeles to Mojave is the same as the Mint Canyon route as far as Saugus. No definite information is available in regard to the road for a stretch of 25 miles north of Saugus. At the forks a short distance north of this town the Bouquet Canyon road is the left branch. It crosses the dry wash of Santa Ana River and leads northeast up a large dry wash, which, as the canyon becomes narrower, is replaced by a small stream that the road crosses frequently. It is probable that there are no important branch roads between this locality and the Leonis School, in Leonis Valley, 25 miles from Saugus. At this point the road divides. The road to the right leads southeast to **Palmdale** (about 10 miles). The traveler bound for Mojave should turn to the left and continue 7.3 miles to **Elizabeth Lake**, where water, gasoline, and other supplies can be obtained. Here there is another fork. The traveler may go east and then northeast across Portal Ridge, and thence to **Del Sur** and north to **Willow Springs**, or he may continue northwestward for about a mile and then turn north across Portal Ridge. On the latter course the road forks on the north side of the ridge, the left branch leading to **Fairmont**, **Neenach**, and the Ridge route beyond the west end of **Antelope Valley**. The right branch leads to **Willow Springs** and thence to **Mojave**. The road is marked by Automobile Club signs for most of the distance. The distance from Los Angeles to Mojave by the Bouquet Canyon route is 100 miles, only 6 miles less than by the Mint Canyon route, and, as the latter is paved for much of its length, it is to be preferred.

MOJAVE TO BAKERSFIELD AND SAN FRANCISCO.

From Mojave a road leads northwestward through Tehachapi Pass to **Bakersfield**, whence there is a choice of routes to **San Francisco**. This road was not traveled, and the following brief notes concerning it as far as Tehachapi are based on maps of the Automobile Club of Southern California. From the railroad station at Mojave the road leads northward along the east side of the Southern Pacific Railroad tracks. About half a mile from the station a branch of the railroad to the right (northeast) is crossed. The road continues close to the main line of the railroad. About 4.5 miles north of Mojave it bends westward and enters the canyon of **Cache Creek**. It crosses to the south side of the tracks at **Monolith**, 16 miles from Mojave. At **Tehachapi**, 20 miles from Mojave, water, general supplies, and lodging can be obtained. It is understood that water can also be obtained at **Monolith** and **Cameron**, and possibly at other points. The road is upgrade to a point within 3 miles of **Tehachapi**, but so far as is known the grade is nowhere excessive. Inquiry should be made at **Tehachapi** as to choice of routes to **Bakersfield** and **San Francisco**.

MOJAVE-INYOKERN-LITTLE LAKE-BIG PINE (MIDLAND TRAIL).

From Mojave an important road, known as the **Midland Trail**, leads north along the east foot of the **Sierra Nevada** through **Independence** to **Big Pine**.

Thence it leads northeast through Tonopah, Nev., to Ely, where it joins the Lincoln Highway to Salt Lake City and the Eastern States. Another road continues north from Big Pine to the Mono Lake region and other points in northern California. The road is used to a great extent by travelers between the Eastern States and southern California and by many people from the southern part of the State, who take camping trips in the Sierra Nevada. From Mono Lake a road leads through Tioga Pass to Yosemite Valley. The Midland Trail is also used for local travel to Inyokern, Trona, Borosolvay, and Westend. The road is marked by signs erected by the Automobile Club of Southern California. Water, supplies, and repairs can be obtained at several points. The logs are given only for the road between Mojave and Little Lake.

MOJAVE TO INYOKERN AND LITTLE LAKE (70 MILES).

[For log of road in opposite direction see p. 161.]

- 0.0 **Mojave.** Railroad station on left. Go north parallel to railroad.
- 0.3 Turn to right (east). Automobile Club sign. Road straight ahead, crossing railroad immediately beyond, leads to Los Angeles.
- 0.5 Road forks. Automobile Club sign. Road on left (approximately north) toward railroad is Midland Trail to Inyokern, Keeler, Independence, and Big Pine. It also leads to Randsburg by way of Cantil and Garlock. (See p. 164.) Road on right (approximately east) leads to Randsburg by way of Atolia. (See p. 165.) Trona, Borosolvay, and Westend may be reached by either road. Log is given for left-hand road.
- 1.3 Turn to right (northeast) parallel to railroad.
- 13.3 **Neuralia.** Turn to left (west) across track and then to right (north), shortly beyond turning to left away from track.
- 13.6 Avoid old road on right.
- 14.7 Roads intersect diagonally. Turn to right (east of north).
- 15.5 Road comes in on left (southwest).
- 18.5 Road comes in on left (southwest).
- 19.0 Old store at **Cinco.** **Water** and gasoline sometimes obtainable, but supplies not dependable.
- 20.7 Roads forks. A well-marked road turns to left (northwest) up Jawbone Canyon. This is an optional route of the Midland Trail to Inyokern, Independence, Big Pine, etc. Steep grades are encountered in one or more places, and it is not generally used except in wet weather, when it is the best route. The main road continues northward to Redrock Canyon.
- 21.3 Road branches on right (east) to railway, leading to **Cantil**, 2.5 miles, where **water**, gasoline, and food supplies can be obtained.
- 24.2 Road forks. Road on left (north) is Midland Trail through Redrock Canyon. Straight ahead (right fork) is road to Randsburg. (See p. 164.) Just beyond fork a road comes in on right (south) from Cantil (1.5 miles). Log is given for left-hand road.
- 26.3 Pass buildings of Bonanza Gold Mining Co. and continue up the canyon, avoiding road up a branch canyon to right. **Water** for automobile radiator can be obtained from reservoir.
- 27.8 **Ricardo.** **Water** and probably also some supplies obtainable, at least in the tourist season.
- 31.6 Road comes in from right. This is the route by way of Jawbone Canyon. (See mile 20.7 above.) Main road bends to right (north), and in a short distance ascends a grade.

- 32.3 Summit of grade. Road from this point leads north down a long, gradual slope.
- 34.9 Cross Los Angeles aqueduct. Avoid road to left along the aqueduct.
- 39.6 Cross a wide, deep wash.
- 42.1 Cross Los Angeles aqueduct.
- 43.9 Avoid branch road to left, which is probably a short cut to the road to Walker Pass.
- 44.8 In botton of gully, near ruins of Freeman station, with aqueduct crossing gully a short distance to right. In February, 1920, water was flowing from a pipe at a water trough near ruins of house on north side of gully. A branch road leads to left up Freeman Canyon, through Walker Pass to Onyx, Weldon, Kernville, and Bakersfield. No information is available in regard to this road. Main road turns to right on grade out of gully and then to left. Avoid road turning into house east of aqueduct.
- 45.4 Cross aqueduct, which is buried.
- 46.1 Road comes in on left from Walker Pass.
- 46.3 Road forks. Road at left is direct route to Independence, Big Pine, etc. Right branch leads to Inyokern (6 miles), where water, gasoline, groceries, and hotel accommodations for a few persons can be obtained. From Inyokern a road leads northward along the Southern Pacific Railroad through Brown, joining the main road at mile 63.4. This branch road to Inyokern should be taken by persons going to Trona, Borosolvay, Westend, and mining camps around Searles Lake and Ballarat. (See p. 163.) The mileage is given for the direct route, along the foot of the mountains.
- 50.8 Indian Wells. Water. It is reported that in the tourist season some supplies are obtainable. The road continues northward near to and parallel to the foot of the mountains. Several roads branch from the main one.
- 63.4 (approximate) A branch road comes in on right (from south) from Brown and Inyokern.
- 66.4 (approximate) Turn to right across railroad and then to left along it.
- 70.0 Little Lake post office. Water, gasoline, and hotel accommodations available. No definite log is given for the road beyond this point. It crosses to west side of railroad and continues north. Five miles north of Little Lake, near a clay flat, the road forks, and either branch may be followed, as the roads unite about 5 miles farther north. The next place where supplies may be obtained is Cowan station, 11 miles north of Little Lake. Olancha is about 26 miles north of Little Lake; Long Pine, 41 miles; Independence, 67 miles; and Big Pine, 96 miles.

LITTLE LAKE TO INYOKERN AND MOJAVE (70 MILES).

[For log of road in opposite direction see p. 160.]

This road is the Midland Trail, used by travelers from Salt Lake City, Utah, Ely and Tonopah, Nev., and Big Pine and Independence, Calif., to points in southern California. The road was not traveled by the writer north of Little Lake, and the log starts at that point.

- 0.0 Little Lake post office, on east side of railroad. Go south along railroad.
- 3.6 Cross to west side of railroad and continue south.

6. 6 Road forks. Automobile Club sign. Road on left (to southeast) leads to Brown (5 miles), Inyokern (16 miles), Trona and other points on Searles Lake, and Randsburg. (See p. 170.) Right branch is main road to Mojave and Los Angeles. If the traveler needs supplies he can take the left-hand road to Brown and Inyokern, thence turning back to the main road. Log is given for right-hand road, which continues southward close to the foot of the Sierra Nevada.
19. 2 **Indian Wells. Water.** It is reported that supplies are available here in the tourist season. If not and the traveler needs supplies, he can turn southeast to Inyokern, about 5 miles.
21. 0 Branch road leads straight east to Inyokern.
23. 7 Road comes in on left from Inyokern.
23. 9 Road forks. Automobile Club sign. Road to right (west) toward mountains leads to Onyx, Weldon, Kernville, and Bakersfield by way of Walker Pass. No information is available in regard to this road. The main road is the left branch.
24. 6 Cross Los Angeles aqueduct, which is buried here.
25. 1 Road makes sharp turn to right and descends into a gulch, in the bottom of which are ruins of the old **Freeman station**. In February, 1920, **water** was flowing from a pipe at a water trough near ruins on north side of the gulch. A road leads up the gulch to Walker Pass and points in Kern River valley. Main road turns to left and ascends out of the gulch.
26. 1 Road comes in from right.
27. 9 Cross to east side of aqueduct. Avoid road leading along the aqueduct.
30. 3 Cross a wide, deep gulch.
35. 1 Cross aqueduct and continue straight ahead (south), avoiding road to left along the aqueduct.
37. 7 Top of grade leading southeast down hill.
38. 3 Road forks. Road to right goes by way of Jawbone Canyon and joins the other road at mile 49. 3. It is said to be the best route in very wet weather. Log is given for left-hand road, which goes down Redrock Canyon.
42. 2 **Ricardo. Water** and probably also some supplies obtainable, at least in the tourist season.
43. 7 Pass buildings of Bonanza Gold Mining Co. and continue down the canyon. **Water** for automobile radiators can be obtained from a large reservoir.
45. 8 Road forks. Follow road on right (south). Road straight ahead, down wash, leads to **Cantil** (1.5 miles), where **water** and supplies can be obtained. A road leads from Cantil back to the main road at mile 48.8.
46. 0 Road comes in on left from Garlock and Randsburg (see mile 24.2 of log on p. 164).
48. 8 Branch road comes in on left (east) from Cantil (1.5 miles).
49. 3 Road comes in on right (northwest). Automobile Club sign. This is the optional route by way of Jawbone Canyon that left the main road at mile 38.3.
50. 0 Old store at **Cinco. Water** and gasoline sometimes obtainable, but supply is not dependable.
51. 5 Branch road on right leads southwest. Automobile Club sign.
54. 5 Branch road on right leads southwest. Automobile Club sign.
55. 3 Roads intersect diagonally. Turn to left (southeast).

- 56.7 Turn to left, cross track, and turn to right (southwest) along railroad at Neuralla station. Automobile Club sign.
- 68.7 Turn to left, away from railroad.
- 69.5 Road comes in on left (northeast). Automobile Club sign. This is the optional route from Randsburg by way of Atolia. (See p. 165.)
- 69.7 Turn to left along railroad to center of Mojave.
- 70.0 **Mojave.** Railroad station on right. Hotels, garages, and general supplies. From Mojave road leads south to Lancaster, Palmdale, and Los Angeles (see p. 157); west to Bakersfield and San Francisco by way of Tehachapi Pass (see p. 159), and east to Barstow and eastern points (see p. 152).

INYOKERN TO WESTEND, BOROSOLVAY, AND TRONA.

From Inyokern a road leads eastward to Westend (originally called Hank-site), Borosolvay, and Trona. Persons going from Los Angeles to these points sometimes use this route instead of the one by way of Atolia and Randsburg. (See pp. 165, 167.) Branch roads lead from it to mining camps in the mountains around Searles Lake, and from Trona a road continues northeastward to Ballarat and Skidoo, and across Death Valley to Rhyolite. The latter route is sometimes used to reach points in Nevada in winter, when the Midland Trail is closed by snow in the mountains east of Big Pine. The road was not traveled for the entire distance, and no definite log can be given, but the following directions will aid the traveler. The road has been signposted by the Automobile Club.

On leaving Inyokern there are two possible routes for the first few miles. One road leads directly east from the railroad station. For persons knowing the region well it is possibly half a mile shorter than the other road, but it winds around and several roads branch from it, so that a person new to the region may get on the wrong road. The other road, for which the description is given, leads northeast from the railroad station a little more than half a mile to a substation of the Southern Sierras Power Co. Thence it leads due east on a section line for about 8 miles to an Automobile Club signpost. The section-line road continues eastward, but it becomes very sandy and should be avoided. The best road leads south and southeast for a little more than a mile and then turns east. It was not traveled beyond this point for some distance, and the route therefore can not be definitely outlined. In general, however, it continues in an easterly direction across a valley and over a divide into Salt Wells Valley, coming into the Salt Wells Canyon road from Randsburg to Trona near the old Salt Wells stage station (abandoned). The route from this point is the same as the Salt Wells Canyon road, beginning at mile 26.3 of log in left-hand column on page 168. According to signs erected by the Automobile Club the distance from Inyokern to Westend is 29 miles, to Borosolvay 31 miles, and to Trona 33 miles. **Water** is obtainable at several ranches in the first 8 or 9 miles east of Inyokern, but after that none is obtainable until Westend is reached.

MOJAVE-RANDBURG.

From Mojave two routes lead to Randsburg. One of these goes northeast along the Southern Pacific Railroad through Cantil and Garlock and thence east to Randsburg. The other route, which lies farther south, goes northeast to Atolia. For most of the distance it passes through unsettled territory until Atolia is reached. (See p. 165.) The latter route is probably used more,

because many persons going to Randsburg also have interests in Atolia. The former route is used largely by persons going to Fremont Valley and the salt works at Saltdale. This road as far as Redrock Canyon is part of the Midland Trail leading to Independence, Big Pine, Tonopah, Goldfield, Ely, and Salt Lake City. Both of the two routes mentioned are used by travelers going to Trona and the north end of Death Valley.

MOJAVE TO RANDBURG BY WAY OF CANTIL AND GARLOCK (45 MILES).

[For log in opposite direction see below.]

- 0.0 **Mojave.** Follow log of Midland Trail from Mojave to Independence, Big Pine, etc., on page 160, as far as mile 24.2.
- 24.2 **Road forks.** Road on left is Midland Trail to Inyokern, Independence, Big Pine, etc. It is also used by travelers going to Trona and other points on Searles Lake. Road on right (straight ahead) leads to Garlock and Randsburg, and log is given for it.
- 24.4 **Roads come in on right (southeast) from Cantil (1.5 miles) and on left (northwest) from Redrock Canyon.** Just beyond, cross old railroad grade.
- 26.9 **Koehn or Cane Spring.** Water at ranch house.
- 29.2 **Saltdale.** Water.
- 33.6 **Garlock station.** Water at section houses.
- 35.6 **Town of Garlock.** Water from several wells. A road leads east from Garlock to Randsburg, but no information is available in regard to it. Continue northeast along railroad.
- 39.2 **Roads intersect diagonally.** Take road to right (southeast) across railroad to Randsburg. Road to left leads to **Goler Well** (0.5 mile), near the foot of the mountains. Road straight ahead (east along railroad) leads to Searles station and thence to Trona. One may follow the railroad to the road from Randsburg to Trona at Summit Diggings or may take the road northeast across the hills to Searles station.
- 44.8 **Junction with road from left parallel to electric-power transmission line.**
- 45.1 **Junction with paved road from left on north outskirts of Randsburg.** Paved road is from Johannesburg. Continue south.
- 45.3 **Randsburg post office.** Hotels, garages, and general supplies. From Randsburg roads lead north to Inyokern, Independence, and other points on the Midland Trail and to Borosolvay, Trona, Ballarat, and points in north Death Valley (see pp. 167, 170); east to Granite Wells, Silver Lake, and points in south Death Valley (see p. 171), and to Barstow, by way of Copper City (see p. 178); and south to Mojave, Kramer, Barstow, and San Bernardino, by way of Atolia (see pp. 133, 166).

RANDBURG TO MOJAVE BY WAY OF GARLOCK AND CANTIL (45 MILES).

[For log in opposite direction see above.]

This is one of two routes between Randsburg and Mojave; the other one going by way of Atolia. (See p. 166.) The latter route is probably used more than the former, because many persons have interests in Atolia and stop there. The mileage is practically the same by each road.

- 0.0 **Randsburg.** Post office on left. Go north along paved road leading to Johannesburg, passing around hill north of town.
- 0.2 **Follow branch road to left (northwest) along high-power electric-transmission line, leaving paved road.**

- 0.5 Road forks. The traveler may continue along the power line or follow road to the left. Mileage is given by the left-hand road.
- 6.1 Cross Southern Pacific Railroad and turn to left (southwest) parallel to it. Road straight ahead leads to **Goler Well** (0.5 mile), near foot of mountains. Road to right (northeast) along railroad leads to Searles station and thence to Trona.
- 9.7 **Garlock.** Water from several wells. A road comes in at Garlock from Randsburg, but nothing is known in regard to it.
- 11.7 **Garlock Station.** Water at section houses.
- 16.1 **Saltdale.** Water.
- 18.4 **Koehn or Cane Spring.** Water at ranch house.
- 20.9 Branch road on left (south) leads to **Cantil** (1.5 miles), where water, gasoline, oil, and food supplies may be obtained. From Cantil a road returns to the main road at mile 24.3. Branch road on right (north) leads to Midland Trail through Redrock Canyon. (See p. 160.) Main road continues southwestward, at mile 21.1 joining a road from the right, which is the Midland Trail. For road from this point to Mojave see log on page 162, beginning at mile 46.0.

MOJAVE TO RANDSBURG BY WAY OF ATOLIA (45 MILES).

[For log in opposite direction see p. 166.]

This is one of two routes between Mojave and Randsburg, the other one going by way of Cantil and Garlock. (See p. 164.) The route described in this log is used extensively by persons going to the Atolia tungsten district and to Randsburg and Trona. It is also used by travelers going to Barstow when water on Rogers "Dry Lake" prevents the use of the route along the Atchison, Topeka & Santa Fe Railway between Muroc and Kramer. The route is marked by signposts erected by the Automobile Club of Southern California.

- 0.0 **Mojave.** Railroad station on left. Go north parallel to railroad.
- 0.3 Turn to right (east). Automobile Club sign. Road straight ahead, crossing railroad just beyond, leads to Los Angeles.
- 0.5 Road forks. Automobile Club sign. Road on right (northeast) leads to Atolia and Randsburg; road on left is Midland Trail to Independence, Big Pine, Goldfield, Rhyolite, Ely, and Salt Lake City, and it also leads to Randsburg by way of Cantil and Garlock. (See p. 164.) Take right-hand road.
- 1.0 Road comes in on right (south) from south end of Mojave.
- 11.3 Road branches to right. Continue straight ahead.
- 13.0 Road branches to right. Continue straight ahead.
- 13.2 Ranch house on left side of road. Water obtainable here. Road at this ranch turns to right (east) along fence for 1 mile, then left (north) 0.4 mile, then right (northeast).
- 29.9 Roads cross diagonally. Continue straight ahead.
- 35.1 Pass under electric-power transmission line.
- 35.3 Crossroads. Automobile Club sign. Road on left (north) leads to Atolia, Randsburg, Johannesburg, and Trona. Road on right leads to Kramer, Hinkley, Barstow, and San Bernardino. (See mile 9.3 of log on p. 133.) Road straight ahead leads to Blackwater Well, Granite Wells, and Death Valley. Turn to left.
- 38.1 Road forks. Right branch leads to Atolia and Randsburg; left branch is a short-cut road to Randsburg. Mileage is given by former road.
- 39.7 **Atolia.** Crossroads at station. Water, general supplies, and accommodations were obtainable in 1918, but the tungsten mines were closed

in 1919, and the continued existence of the town is uncertain. As late as January, 1920, watchmen were living in the town, and water and supplies were obtainable. From Atolia a road leads east to Blackwater and Granite Wells, and thence to Silver Lake and points in south Death Valley or to Barstow by way of Copper City. (See p. 178.)

- 41. 6 Roads fork; left branch leads to Randsburg and Johannesburg.
- 42. 6 Intersection with paved road. Follow this past several intersecting roads, across divide, and along electric-power transmission line.
- 44. 1 Road forks, east end of Randsburg, near substation of Southern Sierras Power Co. (on right). Right-hand road leads to Johannesburg (1 mile); left-hand road is main street of Randsburg. Johannesburg may also be reached by going through Randsburg.
- 44. 5 **Randsburg.** Post office on left. Hotels, garages, and general supplies. (See p. 164 for routes diverging from Randsburg.)

RANDBURG TO MOJAVE BY WAY OF ATOLIA (45 MILES).

[For log of road in opposite direction see p. 165.]

This road is one of two routes used by travelers between Randsburg and near-by points and Mojave and Los Angeles. The other route leads farther to the west, passing through Garlock and near Cantil. (See p. 164.) The road described in this log is probably used more than the other, especially by persons from the tungsten mines near Atolia. Both routes are used by travelers from Trona and north Death Valley. The route is marked by signposts erected by the Automobile Club of Southern California.

- 0. 0 **Randsburg.** Post office on right. Go east on main street of town.
- 0. 4 Road forks. Automobile Club sign. Road on left leads to Johannesburg. Turn to right (south) up wash, along west side of substation of Southern Sierras Power Co. Cross divide and follow paved road southeast.
- 1. 9 Road forks. Take road on left along east side of hill, which leads to Atolia, but if the traveler desires he may continue on the paved road to the right around west side of hill, coming into the main road several miles beyond.
- 4. 8 **Atolia.** Crossroads at station. (See note on p. 165 in regard to supplies.) From Atolia a road leads east to Blackwater and Granite wells and thence to Silver Lake and points in Death Valley or to Barstow by way of Copper City. (See p. 178.) Most travelers to Barstow continue south along the railroad to Kramer and thence east. From Atolia continue south.
- 6. 4 Branch road comes in on right (from north). This is the optional road mentioned at mile 1.9.
- 9. 3 Crossroads. Automobile Club sign. Turn to right (southwest). Road straight ahead (south) leads to Kramer, Barstow, Victorville, and San Bernardino. (See mile 9.3 of log on p. 133.) Road on left (north-east) leads to Blackwater and Granite wells and to Death Valley.
- 14. 6 Roads cross diagonally. Automobile Club sign. Continue straight ahead (southwest).
- 29. 9 Turn left (south) along fence.
- 30. 3 Turn right (west) on section-line road.
- 31. 3 Ranch house on right. **Water.** Turn obliquely to left (southwest), avoiding road due west on section line.

- 31.5 Branch road comes in on left.
- 33.2 Branch road comes in on left.
- 43.5 Branch road leads to left toward south end of Mojave.
- 44.0 Road comes in on right. Automobile Club sign. The road on right is the Midland Trail to Independence, Big Pine, Goldfield, Rhyolite, Ely, Nev., and Salt Lake City, Utah, and optional route to Randsburg by way of Cantil and Garlock. (See pp. 160, 164.)
- 44.2 Turn to left on main street of Mojave.
- 44.5 **Mojave.** Railroad station on right. Hotels, garages, and general supplies. From Mojave roads lead south to Lancaster, Palmdale, and Los Angeles (see p. 157); west to Bakersfield and San Francisco by way of Tehachapi Pass (see p. 159); and east to Barstow and eastern points (see p. 152). They are marked by Automobile Club signs, and one should have no difficulty in following them.

RANDSBURG-TRONA.

RANDSBURG TO TRONA (39 MILES).

[For log of road in opposite direction see p. 169.]

This route is used by persons going to Borosolvay, Trona, Ballarat, and to points in the northern part of Death Valley. It is often used as a route to Tonopah and Goldfield, Nev., and points farther east by way of Death Valley during the winter months, when the Midland Trail is closed by snow in the mountains east of Big Pine. The Midland Trail is also reached by this road near Inyokern.

- 0.0 **Randsburg.** Post office on left. Go north, following paved road around hill to Johannesburg, avoiding all branches on the left.
- 2.1 Pass hotel at **Johannesburg** and continue straight ahead (southeast), avoiding right-hand road to stores.
- 2.2 Road forks. Automobile Club sign. Branch road on right (southeast) leads along railroad to Atolia. Follow left-hand road around hill.
- 3.2 Road forks. Geological Survey sign. Branch road on right (east) leads to Mountain Wells, Granite and Blackwater wells, Silver Lake, and south Death Valley, and to Barstow by way of Copper City. (See p. 171.) Take left-hand road.
- 7.3 Old road branches to right.
- 8.6 Branch road comes in on right (southeast).
- 9.5 Road comes in on left (southwest) from Garlock, Cantil, and Mojave.
- 9.6 Cross railroad and turn to right along it.
- 9.9 Avoid branch road on right leading to near-by shack.
- 10.6 Avoid branch road on left.
- 10.7 Cross old railroad grade, then cross small valley and pass old railroad grade again at mile 11.1 and mile 11.3.
- 11.5 Road forks just south of mouth of railroad tunnel. Automobile Club sign. Take right-hand road. Road on left leads to Searles station and Inyokern and thence to the Midland Trail, which leads to Independence and Big Pine, Calif., Tonopah and Ely, Nev., and Salt Lake City, Utah. (See p. 171.)
- 13.6 Old Searles stage depot (on right), now abandoned. Geological Survey sign. A road comes in on left (southwest) from Searles station (1.3 miles), where water may be obtained. A road also comes in from the west. Continue north.

- 14.0 Road forks. Automobile Club sign. Both branches lead to Trona. The left branch, called the Salt Wells Canyon route, is about 2 miles shorter than the right branch, known as the Valley route. The former is most generally used. The log is given for both roads.

Left-hand road (Salt Wells Canyon route).

- 14.4 Cross railroad. On north side of railroad a branch road turns to left (west).
- 17.3 Old road branches to right.
- 26.3 Old Salt Wells stage station (abandoned) on left. A well back of the house contains water of very poor quality, but it can not be obtained without a rope and bucket. A road leads from this place west to Inyokern and other points in Indian Wells Valley. (See p. 163.) Continue northeast.
- 27.4 Branch road comes in on left (west) across wash from Indian Wells Valley.
- 28.5 Enter Salt Wells Canyon. Geological Survey sign. **Running water in the canyon is very salty and absolutely unfit to drink.** At least one person has died from the effects of drinking this water.
- 33.0 (approximate) A faint road may continue down wash toward south end of lake leading to mine prospects on east side of Searles Lake. Main road leads toward a rocky point on north side of wash.
- 33.5 Junction with Valley road. (See right-hand column.) Automobile Club sign. Continue north a short distance west of railroad.

Right-hand road (Valley route).

- 22.9 Avoid branch road to right.
- 23.5 Cross to north side of railroad.
- 25.1 Avoid branch road to left.
- 30.8 Cross to east side of railroad and turn to left (north) along it.
- 34.2 Crossroads. Continue north along railroad.
- 35.2 Cross to west side of railroad.
- 35.3 Junction with Salt Wells Canyon road. (See left-hand column.) Automobile Club sign. Set speedometer at 33.5 and continue north a short distance west of railroad.

- 34.5 (approximate) Town of **Westend** (formerly called Hanksite), where a new industrial plant was being built in April, 1920. **Water and supplies** probably obtainable here.
- 36.6 Cross railroad. A short distance beyond the railroad a road branches to left. Cross track again and continue north to **Borosolvay** (mile 37.5 approximately). **Water and supplies.** The road to Trona leads north-east across the clay flat. In wet weather it is necessary to follow a road around the west side of the clay flat.

39.0 **Trona.** Water, gasoline, and accommodations can be obtained from the American Trona Corporation. A road leads north to Ballarat, Skidoo, Rhyolite, and Goldfield across the north end of Death Valley. Travelers following this road should make full inquiry at Trona in regard to the exact route and the condition of the road.

TRONA TO RANDSBURG (39 MILES).

[For log of road in opposite direction see p. 167.]

This road is used by persons going from the industrial plants on Searles Lake to Mojave and Los Angeles by way of Randsburg. It is also used by travelers from Tonopah, Goldfield, and other points east of Death Valley during the winter months when the Midland Trail is closed by snow in the mountains east of Bigpine.

- 0.0 **Trona**, near plant of American Trona Corporation. The road leads southwest across the flat of Searles Lake. In wet weather it is necessary to go around the west side of the lake.
- 2.4 Cross to west side of railroad near a rocky point. Just before the railroad is crossed a road comes in on the right (northwest) from **Borosolvay**.
- 4.5 (approximate) Town of **Westend** (formerly called Hanksite).
- 5.5 Road forks. Automobile Club sign. Either branch may be chosen. The branch on the left (crossing the railroad) is known as the Valley route. The branch on the right, known as the Salt Wells Canyon route, is about 2 miles shorter than the other, and is the one generally used. Mileage is given for both roads.

Left-hand road (Valley route).

- 5.5 Road forks. Turn to left, cross railroad, and turn to right (south) along it.
- 6.6 Cross northwest-southeast road.
- 10.0 Cross to west side of railroad and turn southwest.
- 15.7 Old road comes in on right (northwest).
- 17.3 Cross to south side of railroad.
- 17.9 Branch road comes in on left.
- 26.8 Junction with Salt Wells Canyon route. (See right-hand column.) Set speedometer to 25.0 and continue south.

Right-hand road (Salt Wells Canyon route).

- 5.5 Continue on west side of railroad, a short distance beyond turning to right up Salt Wells Canyon. **Water flowing at several points in the canyon is very salty and absolutely unfit for drinking.** At least one person has died from the effects of drinking this water.
- 10.5 Emerge from Salt Wells Canyon.
- 11.6 Branch road leads to right, across wash, to Indian Wells Valley. The road commonly used to this valley turns off near Salt Wells stage station, mile 12.7. A short distance beyond, main road turns southwest.
- 12.7 Old Salt Wells stage station (abandoned) on right. A well back of the house contains water of very poor quality,

Right-hand road (Salt Wells Canyon route)—Continued.

but it can not be obtained unless the traveler has a rope and bucket. The water should not be used for drinking. From this place a road leads northwest and west to Inyokern and other points in Indian Wells Valley. (See p. 163.) Main road continues southwest up long alluvial slope.

- 21.7 Old road comes in on left.
 24.6 Cross railroad.
 25.0 Junction with Valley road. Automobile Club Sign. Continue south.
- 25.4 Old Searles stage station (abandoned). Geological Survey sign. Near the old buildings a road leads southwest to **Searles** station (1.3 miles), where **water** may be obtained. A road also leads west. Continue south, avoiding these branch roads.
- 27.5 Road comes in on right (from northwest) just above railroad tunnel. Automobile Club sign. This road leads to Inyokern and the Midland Trail to Big Pine, Independence, etc. (See p. 171.)
- 27.7 Cross old railroad grade, turn to right, and cross a small valley.
- 28.3 Cross old railroad grade at top of hill.
- 28.4 Branch road comes in on right. Road bends to left.
- 29.1 Branch road comes in on left.
- 29.4 Cross to south side of railroad.
- 29.5 Avoid branch road on right (southwest), which leads to Garlock, Cantil, and Mojave.
- 30.4 Avoid old road on left (southeast).
- 31.7 Branch road comes in on left.
- 35.8 Road junction. Geological Survey sign. Road coming in on left (east) leads to Granite Wells, Silver Lake, and points in south Death Valley. (See p. 171.) Continue straight ahead (southwest).
- 36.8 Crossroads on outskirts of **Johannesburg**. Continue straight ahead to reach this town (mile 37.0). Meals, hotel, and garage accommodations, and general supplies. To reach Randsburg turn to right along paved road, pass hotel, and follow this road around edge of hill, avoiding all branch roads.
- 39.0 **Randsburg**. Post office on right. Hotels, garages, and supplies. From Randsburg two roads lead to Mojave, one by way of Atolia (see p. 166) and the other by way of Garlock and Cantil (see p. 164). Roads also lead east to Granite Wells, Silver Lake, and points in south Death Valley (see pp. 171, 178); and south to Atolia, Kramer, Barstow, Victorville, and San Bernardino (see p. 133).

RANDBURG TO INYOKERN, BROWN, AND MIDLAND TRAIL.

A road leads from Randsburg to Inyokern and Brown and connects with the Midland Trail 5.3 miles north of Brown. It is used by persons going to the two towns mentioned and to Independence, Big Pine, Bishop, and other points in Owens Valley and adjoining regions. The log is given in only one direction.

- 0.0 **Randsburg.** Follow log of road to Trona, on page 167, as far as mile 11.5.
- 11.5 Road forks near northern portal of Southern Pacific Railroad tunnel. Right branch is road to Trona and other towns on Searles Lake. For Inyokern and Brown take left branch, leading along east side of railroad.
- 12.5 **Searles station. Water.** Cross railroad and turn to right (northwest) along it. About a mile beyond cross back to east side of railroad and continue northwest. The log for the road beyond this point can be given only approximately.
- 18.0 (approximate) After going through an open pass between rock hills, the railroad makes a wide swing to the south, following close to the foot of the mountains, but the automobile road leads almost due west down the alluvial slope, turning northwest alongside the railroad again at about mile 22.0 and crossing to the west side of it at about mile 25.0, thence continuing northward along the railroad to **Inyokern** (about mile 29.0). **Water**, gasoline, groceries, and hotel accommodations are available at Inyokern. From this town the road continues north along the railroad through **Leliter** (4.4 miles) and **Brown** (11.0 miles from Inyokern). **Water** is obtainable at Leliter and water, gasoline, groceries, and hotel accommodations at Brown. From Brown the road continues northward along the railroad. About 5 miles north of Brown it bends to the left, away from the railroad, and joins the Midland Trail, which comes in on the left. (See mile 63.4 of log on p. 161.)

RANDBURG-SILVER LAKE.

RANDBURG TO SILVER LAKE BY WAY OF GRANITE WELLS, LEACH POINT, AND TWO SPRINGS (104 MILES).

[For log of road in opposite direction see p. 174.]

This road is used by travelers going from Randsburg and near-by points to Silver Lake and thence to Goodsprings and other points in southern Nevada. It is also used to reach points in south Death Valley, and as far as Granite Wells it is used as an alternative route to Barstow. **Supplies (other than water) can not be obtained between Randsburg and Silver Lake**, a distance of more than 100 miles, so that the traveler should carry with him a sufficient amount of oil and gasoline, as well as parts for minor repairs. The traveler may, if he desires, go to Atolia, and thence east, reaching this road at Blackwater Well and avoiding some bad stretches on the road herein described. The distance by way of Atolia is about 2 miles greater. (See log, p. 178.)

- 0.0 **Randsburg** post office. Go north, following paved road around hill to Johannesburg, avoiding all branches to the left.
- 2.1 Pass hotel at **Johannesburg** and continue straight ahead (southeast), avoiding right-hand road to stores.
- 2.2 Road forks. Right-hand road (southeast) leads along railroad to Atolia; left-hand road (north of east) leads to Granite Wells, Leach Spring, Silver Lake, etc., and to Trona and the Midland Trail.
- 3.2 Road forks. Geological Survey sign. Left-hand road (northeast) leads to Trona, Ballarat, and Midland Trail (see pp. 167, 170); right-hand road (north of east) leads to Blackwater Well, Granite Wells, Leach Spring, Owl Holes, Saratoga Springs, and Silver Lake, and to Barstow by way of Copper City. Follow right-hand road.

- 5.1 Road comes in on left (northwest). Avoid roads leading to **Mountain Wells** in hills on left and turn southeast up a small valley. **Mountain Wells** furnishes the public supply for Randsburg, and **water** is readily obtainable.
- 5.4 Avoid branch road on right.
- 5.7 Avoid branch road on left and pass through low canyon.
- 11.0 Crossroads; ranch house on left. Continue straight ahead (east).
- 13.5 Branch road on right (south).
- 15.5 Road forks. Geological Survey sign. Right-hand road (east) leads to **Blackwater Well**. **Granite Wells** may be reached by either road and mileage is given for both.

Left-hand road.

- 21.9 Road comes in on right (southwest) from **Blackwater Well**. Geological Survey sign. (See mile 22.2 of right-hand column.)

Right-hand road (by way of Blackwater Well).

- 18.8 Road comes in on right (southwest) from **Atolia**. (See p. 178.) Geological Survey sign.
- 19.2 **Blackwater Well**. Road forks. Geological Survey sign. **Water** may be obtained at the well only by means of a rope and bucket, but a pipe line leads from the well to a trough in a corral several hundred feet north, where good water is usually obtainable. Road on right (south) leads to **Copper City** and **Barstow** (see mile 15.8 of log on p. 179); it is also an optional route to **Silver Lake** by way of **Indian Spring**. Road on left (northeast) leads to **Granite Wells**. **Copper City** and **Barstow** may also be reached by way of **Granite Wells**. Turn to left (northeast).
- 22.2 Road comes in on left (west). This is the direct road from **Randsburg** given in left column at mile 21.9. Set speedometer to 21.9.

- 25.2 Road forks. Geological Survey sign. Road on right (south) leads to **Copper City**, **Indian Spring**, **Crutts** post office, and **Barstow** (see mile 53.8 of log on p. 184). Road on left (northeast) leads to **Granite Wells** (0.5 mile), **Lone Willow Spring**, **Ballarat**, **Hidden Spring**, **Leach Spring**, **Owl Holes**, **Saratoga Springs**, and **Silver Lake**. Turn to left.
- 25.3 Branch road on right (east) leads to **Granite Wells** (0.3 mile), where **water** of good quality is obtainable from a tunnel. **Automobile Club** sign.

- 25.6 Road comes in on right (south) from Granite Wells.
- 34.6 Road comes in on left (west) from Spangler siding.
- 39.5 Road forks. Geological Survey sign. Road on left (northeast) leads to Lone Willow Spring, Wingate Pass, and Ballarat (see mile 57.0 of log on p. 183); road on right leads to Leach Spring, Owl Holes, Saratoga Springs, and Silver Lake. Take right-hand road.
- 47.5 Bad sandy road from about mile 47.5 to about mile 48.0. The sand may possibly be avoided by keeping out of the regular track. East of this point the road follows up a wash. If the road tracks have been washed out the traveler should continue up the wash.
- 50.8 Branch road on left (north), just east of low hill, leads to Hidden Spring. (See mile 53.8 of log on p. 187.)
- 51.2 Road comes in on right (southwest) from Indian Spring and Barstow. (See mile 49.5 of log on p. 189.) This is also an optional road from Randsburg and Atolia by way of Blackwater Well, Copper City, and Indian Spring. (See pp. 178-180.) Geological Survey sign. Continue east.
- 53.6 Road forks. Geological Survey sign. Road on right (east) leads to **Leach Spring** (2.9 miles), from which a road leads northeast to the main road at mile 57.0. The spring is located in the bottom of an arroyo that reaches back into a cove at the foot of the mountains. **The water is good.** Road on left (northeast), turning eastward a short distance up wash, is the main road to Silver Lake.
- 54.3 Road branches to left (northeast), leading to Golden Fleece prospects and **Quail Spring**, 7 miles. (See p. 178.)
- 57.0 Road comes in on right (southwest) from Leach Spring.
- 59.6 Road forks. Geological Survey sign. Road on left (east) down wash leads to Owl Holes, Saratoga Springs, and points in south Death Valley, and also to Silver Lake. (See p. 203.) Road on right (southeast), leaving wash, leads to Desert King Spring, Two Springs, and Silver Lake. The latter is the best and shortest route to Silver Lake, and mileage is given for it. Follow right-hand road.
- 63.4 Road turns to right (south) up wash. The driver should use care not to become stalled in the loose sand and gravel.
- 65.9 Main road turns abruptly to left (east) out of wash. Geological Survey sign. Branch road straight ahead leads to **Desert King Spring**, 0.7 mile. The spring or well is located in the more western of two canyons. It is on the east side of the canyon, about 100 yards south of and 50 feet higher than an old cabin. The quality of the water is only fair. Better water is obtained at Two Springs, about 5 miles farther east.
- 69.0 Branch road comes in on left (north) from **Two Springs**, 2 miles. Geological Survey sign. The springs are easily found, being marked by high grass, and the road leads directly to them. **The water is good.** A road is said to lead from them eastward to Denning Spring, but the writer did not see it. At mile 69.0 main road turns to right (south), and at 69.3 it turns to left (southeast) up a canyon.
- 72.4 Old road branches to right (southeast) to Drinkwater Spring. This may not be passable for automobiles.
- 75.9 Road comes in on right (southwest) from **Drinkwater Spring** (3.5 miles). (See p. 254 for note on location of the spring.) Geological Survey sign.
- 76.1 West edge of "dry lake" flat. Continue east along south edge of flat. A road leading slightly to left comes into main road at mile 79.8.

- 77.8 Old road branches to right (southeast) a short distance east of clay flat.
- 79.8 Branch road comes in on left. This is the same road that diverged at mile 76.1.
- 80.5 Branch road on right (southeast) is a cut-off to Cave Springs-Barstow road. (See mile 22.9 of log on p. 195.)
- 81.1 Road junction. Geological Survey sign. Road on right (southwest) leads to Garlic Springs, Daggett, and Barstow. (See mile 22.4 of log on p. 195.) Road straight ahead (north of east) leads to Cave Springs, Saratoga Springs, and Silver Lake.
- 81.2 Road forks. Geological Survey sign. Road on left (northeast) leads to Cave Springs, Saratoga Springs, and points in south Death Valley. (See mile 59.9 of log on p. 193.) Road on right (east) leads to Silver Lake and Goodsprings. Follow road on right.
- 83.4 Road comes in on left (northwest).
- 91.5 Turn to left (east) at end of long straight stretch at foot of mountain, and a short distance beyond enter wash in low canyon.
- 98.3 Roads cross diagonally. Geological Survey sign. Road straight ahead leads to Silver Lake. Road on right (southwest) is from Bitter Spring and Red Pass, and road on left (northeast) leads to Riggs, Saratoga Springs, etc. (See p. 217.) If the grade about 2 miles farther east is too steep for heavily loaded machines bound for Silver Lake, this town may be reached by following the left-hand road northeast down the valley and around the mountain lying northwest of Silver Lake.
- 99.5 Road comes in on right (southwest).
- 100.8 Road forks near top of hill. Right-hand road (southeast), although the shortest, is very sandy and should be avoided. Follow left-hand road, which leads along edge of mountain and is the better of the two.
- 101.3 Branch road goes to left. In wet weather it may be necessary to follow this road around the north end of the Silver Lake clay flat. In dry weather follow road on right.
- 101.7 Roads join again near edge of "dry lake" flat. Turn to left, across clay flat.
- 103.6 **Silver Lake**; railroad crossing. Store and depot 0.1 mile to left. **Water**, gasoline, oil, general supplies, meals, and sleeping accommodations. From Silver Lake roads lead south to Soda station (see p. 208); east to Valley Wells, Cina, and Nipton (see p. 209); to Goodsprings (see p. 205), and to Tecopa and Zabriskie by way of Pahrump Valley (see p. 208); and north to Saratoga Springs, Owl Holes, and to Shoshone, Tecopa, and Zabriskie by way of Death Valley (see p. 202).

SILVER LAKE TO RANDSBURG BY WAY OF TWO SPRINGS, LEACH POINT, AND GRANITE WELLS (104 MILES).

[For log of road in opposite direction see p. 171.]

This road is used occasionally by prospectors and others going from Silver Lake and points east thereof to Randsburg, Atolia, and the near-by mines. A second road, leading farther north, passing Saratoga Springs and Owl Holes, unites with this road about 50 miles from Silver Lake. (See p. 202.) The road described in this log is the shortest and best and the one most commonly used. **Supplies other than water can not be obtained between Silver Lake and Randsburg**, so that the traveler should carry with him a sufficient amount of oil and gasoline, as well as parts for minor repairs.

- 0.0 **Silver Lake** railroad crossing one-tenth of a mile south of depot. Go west across old railroad grade at edge of "dry lake" flat and across the flat. In wet weather it is necessary to go around the north end of the clay flat, keeping south of the low hills at the north end of the lake.
- 1.8 West side of "dry lake" flat. Road forks. Road leading northwest up center of alluvial slope is extremely sandy and should be avoided. Turn to right around the foot of the mountains, coming into the straight road a short distance beyond and avoiding the heavy sand in which many automobiles have been stuck.
- 2.3 Branch road comes in on right. This is the road around north end of clay flat, to be used in wet weather.
- 2.8 Near top of hill, junction with sandy road which branched at mile 1.8. Road descends abrupt hill and turns northwest. Avoid all branch roads.
- 4.1 Avoid branch road on left (southwest).
- 5.3 Crossroads. Geological Survey sign. Continue straight ahead. Road on right (northeast) leads to Riggs, Saratoga Springs, and also to Silver Lake by following around the north end of the mountain that lies northwest and north of Silver Lake. Road on left (southwest) leads to Red Pass and Bitter Springs. (See p. 217.) It connects with an old road that leads to the Silver Lake-Barstow road some miles beyond, but it is very little traveled. From this crossroads the main road leads northwest up a long alluvial slope, later entering a wide wash, which it follows.
- 12.1 A short distance after emerging from wash, at foot of mountain, turn northwest onto long straight stretch.
- 20.2 Branch road on right leads northwest.
- 22.3 Road junction. Geological Survey sign. Continue southwest. Road coming in on right (northeast) is from Cave Springs, Saratoga Springs, and south Death Valley. (See mile 59.9 of log on p. 197.)
- 22.4 Road forks. Geological Survey sign. Follow right branch (west). This leads to Drinkwater Spring, Leach Spring, and Randsburg. Branch on left leads to Barstow and Daggett. (See mile 22.4 of log on p. 195.)
- 23.1 Branch road comes in on left, a cut-off from the Barstow road.
- 23.8 Road forks. Follow left branch. Both of these roads unite at mile 27.5.
- 25.8 Old road comes in on left (southeast). Continue west across "dry lake" flat.
- 27.5 West side of clay flat, road which branched to right at mile 23.8 comes in on right.
- 27.7 Road forks. Geological Survey sign. Follow road on right (west). Road on left leads to **Drinkwater Spring**, 3.5 miles. (See p. 254.)
- 31.2 Faint road comes in on left from Drinkwater Spring.
- 32.5. Enter low pass in granite hills, and a short distance beyond descend through a canyon.
- 34.3 Mouth of canyon, turn to right (north) along foot of mountain.
- 34.6 Road forks. Geological Survey sign. Follow left-hand road. Right-hand road leads to **Two Springs** (2 miles); where **good water** may be obtained. (See p. 173.) Main road leads in a general westerly direction, crossing several deep arroyos.
- 37.7 Road forks at edge of arroyo. Geological Survey sign. Main road turns abruptly to right (north) down a gravelly wash. Branch road leads to left (south) up the wash to **Desert King Spring**, which is located 0.7 mile up the more western of two canyons. The spring or well is

- about 100 yards south of and 50 feet higher than an old cabin on the left side of the wash. The water is only fair in quality.
- 40.2 Road bends to left (northwest), leaving gravel wash.
- 43.2 Road junction. Geological Survey sign. Turn to left (west) up wash. Road coming in on right (east) is from Silver Lake by way of Saratoga Springs and Owl Holes. (See p. 203.) If the road tracks have been washed out, follow westward up bottom of wash.
- 46.6 Branch road on left (southwest) leads up a small wash to **Leach Spring** (1.6 miles) in a cove near the foot of the mountain (see p. 173), where **good water** may be obtained. This branch road may be difficult to find. It turns off just east of where the main road makes a slight bend to the right (north). A road leads from Leach Spring back to the main road at mile 50.0.
- 49.3 Branch road comes in on right from Golden Fleece Prospects and **Quail Spring**, 7 miles. (See p. 178.)
- 50.0 Road comes in on left (from east) from Leach Spring. Geological Survey sign.
- 52.4 Road forks. Geological Survey sign. Continue on right-hand road (west) down wash. Road on left (southwest) leads to Indian Spring (19 miles) and Barstow. (See mile 49.5 of log on p. 189.) This road may also be used by travelers going to Randsburg and Atolla, but as it is longer it is seldom used. (See p. 180.)
- 52.8 Branch road comes in on right (from north) a few feet east of a low hill. This road leads to Hidden Spring (8 miles) and the Crystal Hills epsomite prospects on the north side of the mountain range. (See mile 53.8 of log on p. 187.)
- 55.3 Turn slightly to left, leaving wash. Bad sandy road from about mile 56.0 to mile 56.5. It may possibly be avoided by turning out of the worn tracks.
- 64.1 Road comes in on right (northeast). Geological Survey sign. Continue straight ahead (south of west). Road on right leads to Lone Willow Spring (13 miles) and Ballarat (40 miles). (See mile 57.0 of log on p. 183.)
- 69.0 Branch road on right (west) leads to Spangler siding. This road is not much used and probably is not in good shape. Main road bends south beyond this. About 1 mile south of this faint tracks lead southeast to Lead Pipe Spring, several miles distant. Nothing definite is known about this spring.
- 78.0 Branch road on left (south) leads to **Granite Wells**, 0.3 mile, on north side of granite hill, where **water** of good quality can be obtained from a tunnel.
- 78.3 Road comes in on left from Granite Wells.
- 78.4 Road forks. Geological Survey sign. Follow right branch (west). Road on left (south) leads to Copper City (abandoned, with only a well remaining), Crutts post office, and Barstow (see mile 53.8 of log on p. 184.)
- 81.7 Road forks. Geological Survey sign. Either road may be taken, as they unite at mile 88.1. The left-hand road leads to Blackwater Well and thence directly to Atolla. The distance to Randsburg by this road through Atolla is about 2 miles greater than by the right-hand road, but the road is probably as good, and since a short stretch of it is paved between the two towns, perhaps as good time can be made on it. The log is given for both roads.

Left-hand road, by way of Blackwater Well.

81.7 Follow left-hand road.

84.5 **Blackwater Well.** Geological Survey sign. **Water** can be obtained from well on right only by use of rope and bucket, but a pipe line leads from it to a trough in a corral several hundred feet north of the well, where **good water** can usually be obtained. Road forks. Turn to right (west). Road to left (southeast) leads to Copper City and Barstow. (See mile 15.8 of log on p. 179.)

84.9 Road forks. Geological Survey sign. Road on right (west) leads to Randsburg by way of Johannesburg. Road on left (southeast) leads to Atolla (16 miles) and thence to Randsburg. (See mile 91.2 of log on p. 181.) Log is given for right-hand road.

88.2 Junction with direct road from Granite Wells. Set speedometer to mile 88.1 and continue west.

90.1 Branch road comes in on left (south).

92.6 Crossroads. Ranch house on right. About 2 miles farther west the road leads up a canyon.

97.9 Branch road comes in on left. A short distance beyond avoid branch road on right to **Mountain Wells**, where **water** can be obtained, and turn to left around foot of mountain.

98.2 Avoid branch road on right (northwest).

100.4 Road junction. Geological Survey sign. Continue southwest. Road coming in on right (from northeast) is from Trona, Inyokern, and points on the Midland Trail. (See mile 3.2 of log on p. 167.)

101.4 Crossroads on outskirts of Johannesburg. Continue straight ahead to stores. Meals, hotel, garage, and general supplies. To reach Randsburg turn to right along paved road, past hotel, and follow this around edge of hill, avoiding all branch roads.

103.6 **Randsburg.** Post office on right. Hotels, garage, and general supplies. From Randsburg two roads lead to Mojave, one by way of Atolla (see p. 166) and the other by way of Garlock and Cantil (see p. 164). Roads also lead to Kramer, Barstow, Victorville, and San Bernardino (see p. 133), and north to Independence, Big Pine, and other points on the Midland Trail (see p. 170.)

Right-hand road.

81.7 Follow road on right.

88.1 Road comes in on left (from east) from Blackwater Well.

ROAD TO QUAIL SPRING AND GOLDEN FLEECE PROSPECT.

A road leads northward from the road between Silver Lake and Randsburg, about 54 miles east of Randsburg. (See mile 54.3 of log on p. 173, or mile 49.3 of log of road in reverse direction on p. 176.) No log is given for this road, but the following brief description is inserted. The road leads east of north up a wash, crossing a divide 3.5 miles from the main road. From this divide it descends a small canyon for about 0.2 mile, turns sharply to the left (west) for a short distance and then to the right, ascending a short, steep grade. Beyond this it leads northeast down a slope, bending around to the left, toward the west, continuing in the latter direction for 1.5 miles. The road ends near the mouth of a short canyon, near an old shack. From this shack in 1917 a pipe line led westward across the hills to **Quail Spring**. This spring was not visited by the writer, but it was reported to be located about 0.5 mile west of the shack. A well-worn trail along the pipe line probably led to the spring. There was no water at the shack. Fourth of July Spring is also said to be located in this vicinity, but the writer did not find it.

RANDBURG AND ATOLIA TO SILVER LAKE BY WAY OF BLACKWATER WELL, COPPER CITY, AND INDIAN SPRING (107 MILES).

[For log of road in opposite direction see p. 180.]

This is an alternative route from Randsburg and Atolia to Silver Lake and points in south Death Valley. For a part of the distance it is coincident with the route which is usually traveled (see p. 171), and the traveler has the choice of either road over a longer stretch. As far as Copper City the road is an alternative route to Barstow, although most travelers to that point go by way of Kramer. (See p. 133.) The road given in this log is probably not traveled very often as a unit between Atolia and Silver Lake, but as it includes several stretches which would otherwise have to be given in disconnected logs it is inserted as a unit. It is somewhat longer than the road that is usually traveled, the distance to Silver Lake from Randsburg being 111 miles and from Atolia 107 miles. **No supplies other than water are obtainable on this road between Atolia and Silver Lake.** The log for the road between Randsburg and Atolia is given on page 133 and is not included here, the description beginning at Atolia.

- 0.0 **Atolia.** Railroad crossing at station. (See p. 133 in regard to supplies.) Go east, past tungsten mill. Avoid branch road on right, east of mine shafts, and continue east toward Cuddeback "Dry Lake."
- 1.2 Road comes in on left.
- 2.0 Avoid branch road on right (southeast).
- 4.2 Avoid branch road on left. Continue approximately due east, avoiding branch roads to north and south.
- 7.0 West edge of Cuddeback "Dry Lake." Turn northeast across clay flat.
- 8.7 Shack on left near east edge of clay flat. **Brackish water in well at shack**, but in October, 1917, there was no way of obtaining it, a wind-mill pump being out of order. Several roads branch from this house. One leads northwest, a second northeast, and a third to the right of the latter, slightly north of east; up a long alluvial slope. Follow the third road.
- 15.4 Junction with road on left (west). Geological Survey sign. Continue east. The road on left is from Randsburg. (See mile 18.8 in right-hand column of log on p. 172.)

- 15.8 **Blackwater Well** at left side of road. Road forks. Geological Survey sign. The only means to obtain water from the well is by rope and bucket, but a pipe line leads to a trough in a corral several hundred feet north of the well, where water can be obtained. **The water is good.** From Blackwater Well a road leads northeast to Granite Wells, and thence to Leach Point and Silver Lake. (See mile 19.2, right column of log on p. 172.) This is the road generally used to Silver Lake. Road on right (southeast) around low mountain leads to Copper City and Indian Spring, and the log is given here for that road. Turn to right.
- 19.3 Avoid old road on left (northeast).
- 21.8 Crossroads. Automobile Club sign. Continue east. Road on left (north) leads to Granite Wells (about 4 miles). Road on right (south) formerly led to Hinkley, but it is reported to be impassable for automobiles in Black Canyon, several miles south of the crossroads.
- 25.3 Road junction (three roads intersecting) near ruins of old **Copper City**. Geological Survey sign. **Water** at well near stone ruins 100 yards north of road. When visited in 1918 the water was good, but in January, 1920, it was covered with scum and was not so inviting. Continue south of east down hillside. Road leading west from this point goes to Granite Wells and Ballarat. (See mile 36.2 of log on p. 182.)
- 26.0 Road comes in on left from **brackish spring**, 0.3 mile. **The water from this spring is poor** and should not be used for drinking.
- 26.7 Road forks. Geological Survey sign. Follow road on left (east) for Indian Spring, Leach Spring, and Silver Lake; road on right (southeast) leads to Crutts post office, Barstow, and Daggett. (See mile 61.7 of log on p. 185.) The sign at this place gives Eckley's ranch (7 miles) as a watering place on the road to Barstow, but after the sign was erected it was learned that this ranch had been abandoned. Crutts post office (10 miles) is the nearest reliable watering place to the southeast. Log is given for left-hand road.
- 32.7 Road comes in on right.
- 34.2 **Indian Spring**. The spring is hidden from the road. It lies about 50 feet north of the road, where the road crosses a small dry wash with large boulders. (See Pl. IV.) **Good water** obtainable here. Continue east.
- 34.4 Road comes in on right (south). Geological Survey sign. Road on right leads to Crutts post office, Barstow, and Daggett. (See mile 69.4 of log on p. 189.) Continue east past a prominent rock point. From this point the road to Leach Springs leads approximately east to about mile 36, where it bends northeast, and farther on it bends north. The next 20 miles of this road is not traveled very much, and it may not be in good shape, especially after heavy rains.
- 39.6 Cross low divide and turn slightly to east of north.
- 43.4 Cross a second low divide and turn east of north, some distance beyond entering a large wash, in which the road may be obliterated. Descend this wash (which leads north).
- 49.0 (approximate) Turn to right (northeast), leaving wash.
- 49.1 Faint tracks lead east. These lead to **Myricks Spring**, 0.5 mile southeast, behind a low hill, where water may possibly be obtained in an emergency by digging in a filled-in hole where salt grass is growing.
- 54.3 Junction with east-west road in wash. Geological Survey sign. This is the road which is usually traveled between Randsburg and Silver Lake, and the log of the road is the same east of this point. Set speedometer

to 51.2 and continue east, following log on page 173. A road leading to Hidden Spring branches north from this road at a point 0.4 mile west of the junction. (See mile 53.4 of log on p. 187.)

SILVER LAKE TO ATOLIA (107 MILES) AND RANDSBURG (111 MILES) BY WAY OF INDIAN SPRING, COPPER CITY, AND BLACKWATER WELL.

[For log of road in opposite direction see p. 178.]

This is an alternative route to Randsburg, by way of Atolia. For greater or less distances it is coincident with portions of several other routes described. It is not traveled very much in its entirety between Silver Lake and Atolia, but it is described as a unit because it covers several stretches of road which would otherwise have to be given in disconnected logs. For the first 52 miles the log is the same as that for the regular road to Randsburg.

- 0.0 **Silver Lake.** Follow log of Silver Lake-Randsburg road on page 176 to mile 52.4.
- 52.4 Road forks. Geological Survey sign. Turn to left (southwest) out of wash. Right-hand road (to west) down wash is the more direct road to Randsburg, by way of Granite Wells. A road to Hidden Springs turns north 0.4 mile farther west. (See mile 53.4 of log on p. 187.) Log is given for left-hand road to Atolia by way of Indian Spring and Copper City.
- 57.5 Faint tracks on left lead to **Myricks Spring**, 0.5 mile southeast, behind a low hill, where water may possibly be obtained in an emergency by digging in a filled-in hole where salt grass is growing.
- 57.6 Turn to left (south) up a wash. The road in this wash may be washed out. If so, the traveler should continue approximately south up the wash, turning out of it where it makes a big bend to the east, the road thence leading west of south toward a saddle between low hills. Some difficulty may be encountered because of loose sand or gravel in the wash.
- 63.2 Cross low divide and continue slightly west of south.
- 67.0 Cross second divide.
- 70.6 (approximate) Road bends in a westerly direction.
- 72.2 Road forks near rocky point on left. Geological Survey sign. Continue west on right-hand road. Road on left (south) leads to Crutts post office, Barstow, and Daggett. (See mile 69.4 of log on p. 189.)
- 72.4 **Indian Spring.** The spring is hidden from the road. It lies about 50 feet north of the road, where the latter crosses a small dry wash with large boulders. (See Pl. IV.) **Good water** here. Continue west.
- 73.9 Avoid branch road on left (southwest) to ranches several miles distant.
- 79.9 Road comes in on left (southeast). Geological Survey sign. Continue to right (northwest). Road on left is from Crutts post office, Barstow, and Daggett. (See mile 61.7 of log on p. 185.) Eckley's ranch (7 miles) is listed on the Geological Survey sign at this point as being a watering place on the road to Barstow, but it has been abandoned. Crutts post office (10 miles) is the nearest reliable place to the southeast.
- 80.6 Branch road on right leads to a **brackish spring**, 0.3 mile. **This water is poor and should not be used;** better water at Copper City, 0.7 mile farther west.
- 81.3 Road forks (three branches) near ruins of old **Copper City**. Geological Survey sign. **Water** obtainable at well 100 yards north of road near stone ruins. (See p. 179 for note on quality of water.) Turn to left

- (southwest) and a short distance beyond to right (west) on the central one of the three roads. The extreme left branch leads to mine prospects in Opal Mountain, but it is probably impassable in Black Canyon, several miles to the south. Right branch (west and northwest) leads to Granite Wells, Lone Willow Spring, and Ballarat. (See mile 36.2 of log on p. 182.)
- 84.8 Crossroads. Automobile Club sign. Continue west. Road on right (north) leads to Granite Wells, about 4 miles. Road on left (south) formerly led to Hinkley, but it is reported to be impassable in Black Canyon.
- 87.3 Old road comes in on right. Beyond this point road ascends a hill and bends to right around mountain.
- 90.8 Road forks at **Blackwater Well**. Geological Survey sign. Water in Blackwater Well, but it can be obtained only with a rope and bucket. A pipe line leads to a trough in a corral several hundred feet north of the well, and water can be obtained from it more easily. **The water is good.** Turn to left (west). Road on right (northeast) leads to Granite Wells, Leach Spring, etc. (See mile 19.2, right column of log on p. 172.) It is an optional branch of the regular road from Silver Lake. (See mile 84.5, left column of log on p. 177.)
- 91.2 Road forks. Geological Survey sign. Follow road on left. Road on right (straight west) leads to Johannesburg and Randsburg. (See mile 84.9 of log on p. 177.) It is 1.8 miles shorter to Randsburg than the road given in this log, but the latter is probably in better shape, so that faster time can be made by following the left-hand road.
- 97.9 East edge of Cuddeback "Dry Lake." **Brackish water in well near shack** on right side of road. In October, 1917, water could be obtained from it only with a rope and bucket, the pump being out of order. The water is only of fair quality. Continue south of west across the clay flat.
- 99.6 West side of clay flat. Continue west, avoiding several branch roads on right and left.
- 102.4 Branch road comes in on right.
- 104.6 Branch road comes in on left.
- 105.4 Avoid branch road on right and continue west toward tungsten mill at Atolia.
- 106.6 **Atolia**. Railroad crossing at station. In 1918 hotel accommodations and supplies could be obtained here, but in April, 1919, the mines were closed. As late as January, 1920, watchmen were living in the town, and water and supplies could be obtained. A road leads from Atolia northwest to Randsburg. (See mile 89.7 of log on p. 165.) A road also leads south to Kramer, Barstow, Victorville, and San Bernardino (see p. 133), and one to Mojave (see p. 166).

BARSTOW-BALLARAT.

BARSTOW TO BALLARAT (DIRECT ROUTE, 97 MILES).

[For log of road in opposite direction see p. 184.]

This road is used by travelers going to Crutts post office and near-by homesteads and to Goldstone, to Randsburg, by way of Copper City, and to prospects in south Death Valley and near Ballarat. The northern part of it, leading to Ballarat, has not been used very much in recent years. Ballarat may also be reached by a road that goes by way of Indian Spring and Hidden Spring.

(See p. 186.) It is slightly longer and more difficult and is seldom used. As far as Copper City the road is an alternative route to Atolia and Randsburg, although most travelers to those points go by way of Kramer. (See p. 150.)

- 0.0 **Barstow** post office. Go west on main street of town. (See fig. 3, p. 121, for diagram of roads leading out of town.)
- 0.2 Turn to right (north) and cross railroad. On north side of tracks turn to right (east).
- 0.6 Turn to left (north) and cross bridge over Mohave River.
- 1.0 Turn to left (west).
- 1.1 Turn to right (north).
- 1.5 Road intersection. Road on left (west) leads to Hinkley, Kramer, Randsburg, and Mojave, and to Bakersfield and San Francisco by way of Tehachapi Pass. (See p. 150.) Road straight ahead leads to Crutts post office, Goldstone, Randsburg, Ballarat, and south Death Valley, and to Silver Lake and Goodsprings. Automobile Club signs. Continue straight ahead.
- 1.6 Branch road on right (east) leads to near-by ranches.
- 5.5 Branch road on left leads northwest just north of summit of pass.
- 6.9 Branch road on left leads north of west.
- 7.8 Road forks. Geological Survey sign. Road on right (east) leads to Paradise Springs, Garlic Spring, Silver Lake, Goodsprings, Cave Springs, Saratoga Springs, Zabriskie, and Tecopa (see p. 192); road on left (east of north) leads to Crutts post office, Goldstone, Indian Spring, Copper City, Granite Wells, Randsburg, and Ballarat. Take left-hand road.
- 7.9 Branch road on left leads to strontianite mine.
- 11.3 Road comes in on right (southeast) from Daggett (13.5 miles).
- 13.8 Branch road on right leads to Lanes Well and Goldstone (see p. 189). County signpost. Goldstone may also be reached by way of Crutts post office, although the mileage is slightly greater. Continue on left-hand road.
- 13.9 Branch road on left leads to old Coolgardie placer camp²¹ (see p. 191). Geological Survey sign.
- 20.8 Road forks. Road on right (north) leads to Goldstone, Indian Spring, and thence to Leaches Point, Hidden Spring, and south Death Valley (see p. 186); road on left (northwest) leads to Crutts post office, Copper City, Granite Wells, Randsburg, and Ballarat. Follow left-hand road.
- 24.8 **Crutts** post office. **Water** at ranch house.
- 34.8 Road comes in on right (east) from Indian Spring. Geological Survey sign. (See mile 26.7 of log on p. 179.)
- 35.5 Branch road on right leads to a brackish spring, 0.3 mile. Better water is obtainable at Copper City, 0.7 mile farther on main road.
- 36.2 Road forks (three branches) at top of hill near ruins of old **Copper City**. Geological Survey sign. **Water** in a well about 100 yards to right (north) of road. (See p. 179 for note on quality of water.) Extreme left-hand road leads to prospects in Slocum and Opal Mountains but is probably impassable. Center road leads to Randsburg and

²¹ Accurate mileage was not obtained between the branch road to Coolgardie and Copper City, and the mileage given was determined from the topographic map. Because of certain changes in the road it may not be quite correct between the points mentioned. It is believed that the distance between Crutts post office and the road from Indian Spring at 34.8 is 0.5 mile or more too short, because of the necessity of following section lines around homesteads for a short distance.

- Atolia by way of Blackwater Well. (See mile 81.3 of log on p. 180.) Road on right (west) leads to Randsburg by way of Granite Wells and to Lone Willow Springs and Ballarat. Continue on right-hand road.
38. 1 Little-used road branches to left (northwest). Main road leads nearly due north to mile 39.6, thence makes a sharp turn to left (west) down a wash.
41. 1 Branch road on left goes southwest. A **spring** is reported in a canyon in the granite hills, about half a mile south of this point.
41. 3 Branch road comes in on left (south). County sign.
42. 5 Road forks. Geological Survey sign. Road on left (west) leads to Johannesburg and Randsburg. (See mile 78.4 of log on p. 176.) Road on right (northeast) leads to **Granite Wells** (0.3 mile), Lone Willow Spring, Ballarat, Leach Spring, and points in south Death Valley. Follow right-hand road.
42. 8 Branch road on right (east) to **Granite Wells**, 0.3 mile. **Water** of good quality can be obtained in a tunnel.
43. 1 Branch road comes in on right (south) from Granite Wells. Automobile Club sign.
52. 1 Road comes in on left (west) from Spangler siding.
57. 0 Road forks. Geological Survey sign. Road on right (east) leads to Leach Spring, Owl Holes, Saratoga Springs, south Death Valley, and Silver Lake (see mile 39.5 of log on p. 173); road on left (northeast) leads to Lone Willow Springs, Wingate Pass, and Ballarat. Take left-hand road.
65. 7 Branch road on left (northwest) leads to **Lone Willow Spring** (1.5 miles) and **Earlys Spring** (3.1 miles). Geological Survey sign. When visited in January, 1918, Lone Willow Spring was in bad condition, owing to contamination from dead animals. **Water of better quality** is obtainable at Earlys Spring, 1.5 miles farther west. The road to these springs ascends the steep alluvial slope, and 1.6 miles from the main road, near a ruined stone house, a branch on left leads to Lone Willow Spring, which may be seen, marked by a willow tree, high up on the hillside. From the stone ruins the road continues westward up the hillside to Earlys Spring, which is located in a narrow canyon near several prospect tunnels. The water is good, except that it is rather hard. A notice at the springs states that it contains arsenic, but a careful qualitative test shows that none is present.
69. 0 Road comes in on left (south) from Lone Willow Spring. County sign.
71. 4 Branch road on right leads east. Geological Survey sign. The road on right leads through Wingate Pass to prospects in the Crystal Hills, to Hidden Spring, and to Death Valley. (See p. 188.) This road is probably not passable for more than 10 miles. The Geological Survey sign at this point gives Crystal Hills camp as a watering place, but no water can be obtained there unless some one is living at the camp. The road north of this point, to Ballarat, was not traveled by the writer. The mileage is given from the topographic map and is only approximate. The road follows either the center or the east side of the Panamint Valley, and branch roads leading to the mountains should be avoided.
80. 3 Branch road on right (northeast) leads toward mountain.
81. 7 Branch road comes in on right (east).
89. 4 Branch road comes in on right (southeast).
91. 7 Branch road comes in on right (southeast).

96.5 Ballarat. From Ballarat a road leads southwest to Trona, Searles station, Randsburg, and Mojave (see p. 169), and north by way of Wild Rose Canyon and Emigrant Canyon to Death Valley and Rhyolite. It is not known whether water is obtainable at Ballarat, but it is believed that one or more prospectors are usually living at the old town.

BALLARAT TO BARSTOW (DIRECT ROUTE, 97 MILES).

[For log of road in opposite direction see p. 181.]

This road was formerly an important one, because of travel between Barstow and the mining camps near Ballarat. The northern part, near Ballarat, is seldom used, but the remainder is still traveled considerably. It connects with important roads from south Death Valley and Randsburg. The north end of the route, for 25 miles south of Ballarat, was not traversed by the writer, but for the benefit of travelers who may reach Ballarat from the north the log is given, beginning at that place.

- 0.0 Old town of Ballarat. Go south along the east side of Panamint Valley.
- 5.1 Avoid branch road on left (southeast).
- 7.1 Avoid branch road on left (southeast).
- 14.8 Avoid branch road on left (east).
- 16.2 Branch road comes in on left (northeast).
- 25.1 Road comes in on left (east). Geological Survey sign. Continue south. Road on left leads to epsomite prospects on south side of Wingate Pass to Hidden Spring and to Death Valley. (See p. 188.) It is not passable beyond the first 10 or 15 miles. The Geological Survey sign at this point gives Crystal Hills Camp as a watering place, but unless some one is living there no water can be obtained.
- 27.5 Road forks. Road on right leads to Lone Willow Spring, from which a road returns to the main road at mile 30.8. Road on left is the main road.
- 30.8 Branch road comes in on right (from northwest) from **Lone Willow Spring**, 1.5 miles, and **Earlys Spring**, 3.1 miles. In January, 1918, Lone Willow Spring was not in good condition, having been contaminated by dead animals, and better water was obtainable at Earlys Spring, about 1.5 miles farther west up the mountain, a road leading directly to it. (See p. 183 in regard to these springs.)
- 39.5 Road comes in on left (from east). Geological Survey sign. Continue southwest. The road on the left leads to Leach Spring, Owl Holes, Saratoga Springs, Silver Lake, and south Death Valley. (See mile 39.5 of log on p. 178.)
- 44.4 Branch road on left leads to Spangler siding. Continue in a southerly direction.
- 53.4 Branch road on left leads to **Granite Wells**, 0.3 mile, near foot of granite knob, where water is obtainable in a tunnel.
- 53.7 Road comes in on left from Granite Wells.
- 53.8 Road forks. Geological Survey sign. Follow road on left, which leads to Copper City, Crutts post office, and Barstow. Road on right (west) leads to Blackwater Well, Atolla, Randsburg, and Mohave. (See mile 78.4 of log on p. 176.)
- 55.2 Avoid branch road on right and turn to left (east). County signpost.
- 55.4 Old road comes in on right.
- 57.0 Road makes right-angled turn to right (south) at top of hill.

- 58.4 Little-used road comes in on right (northwest).
- 60.8 Road junction near ruins of old **Copper City**. Geological Survey sign. **Water** in well 100 yards to left (north) of road, near old stone house. (See p. 179 for note on quality of water.) Two roads come in on right. One leads almost due south to prospects in Slocum and Opal Mountains but is probably impassable. The other a few feet south of the junction turns west, leading to Blackwater Well, Atolla, and Randsburg. (See mile 81.3 of log on p. 180.) Continue southeast.
- 61.0 Road comes in on left (northwest) from a brackish spring. The water is of poor quality and should not be used.
- 61.7 Road forks. Geological Survey sign. Follow right branch (southeast).²² Road on left (east) leads to Indian Spring (7.5 miles) and thence northeast to road from Granite Wells to Leach Spring and Silver Lake. (See mile 26.7 of log on p. 179.) The sign at this point gives Eckley's ranch (7 miles) as a watering place, but it has been abandoned and the nearest reliable watering place toward Barstow is Crutts post office (10 miles).
- 71.7 **Crutts** post office on right. **Water** usually obtainable here.
- 75.7 Branch road comes in from left (north) from Indian Spring and Goldstone. (See p. 186.) County sign.
- 82.6 Branch road comes in on right (from northwest) from old Coolgardie camp. (See p. 191.) Geological Survey sign.
- 82.7 Branch road comes in on left (from north) from Lanes Well and Goldstone. (See p. 189.)
- 85.2 Road forks. Geological Survey sign. Take road on right (south). Road on left (southeast) leads to Daggett, 13 miles. (See p. 213.)
- 88.6 Road comes in on right (west) from strontianite mine.
- 88.7 Road comes in on left. Geological Survey sign. Continue southwest. The road on left leads to Paradise Springs, Silver Lake, Goodsprings, and points in Death Valley. (See p. 192.)
- 89.6 Branch road comes in on right (west).
- 91.0 Branch road comes in on right (northwest).
- 94.9 Branch road comes in on left. Main road leads due south.
- 95.0 Road comes in on right (west). Automobile Club sign. Continue south. Road on right leads to Hinkley, Kramer, Randsburg, Mojave, Baker's field, and San Francisco. (See p. 150.)
- 95.4 Turn to left (east).
- 95.5 Turn to right (south) and a short distance beyond cross bridge over Mohave River.
- 95.9 Turn to right (west) along railroad station at Barstow. (See fig. 3, p. 121, for diagram of roads entering Barstow.)
- 96.3 Turn to left (south) across railroad. On south side of track turn to left (east) along main street of Barstow.
- 96.5 **Barstow**. Post office on left. Good hotels, garages, and general supplies. From Barstow the National Old Trails road leads east to Ludlow, Needles, and the Eastern States (see p. 121), and south to Victorville, San Bernardino, and Los Angeles (see p. 127). Roads also

²² Accurate mileage was not obtained for the next 20 miles. The mileage given was determined from the topographic map, and because of certain changes in the road since the map was published the log may not be quite correct. The distance between the road to Indian Spring and Crutts post office may be 0.5 mile or more too short, because of the necessity of following around homesteads on section lines instead of taking a straight southeast course.

lead west to Hinkley, Kramer, Randsburg, Mojave, Bakersfield, and San Francisco (see p. 150), and northeast to Silver Lake, Goodsprings, and Death Valley points (see p. 192).

**BARSTOW TO BALLARAT BY WAY OF INDIAN SPRING AND HIDDEN SPRING
(103 MILES).**

[For log of road in opposite direction see p. 188.]

This road, as a unit, is used very little. It formerly was an important route to Death Valley by way of Wingate Pass and Bennetts Wells, but the road into the valley is now not used and is said to be impassable for automobiles. At several places the road is coincident with parts of other routes for short stretches, with intervening stretches which are not described in any other log, and for this reason the log is given as a unit, so as to include these parts, which otherwise would have to be given in disconnected logs. The road is entirely through unsettled territory and is used principally by prospectors. So far as is known no supplies can be obtained at Ballarat, so the traveler should carry sufficient gasoline and oil to meet his needs until he returns to a definite supply point, and he should be prepared to make repairs if necessary. The road for the first 21 miles is the same as the direct route to Ballarat.

- 0.0 Barstow. Post office on right. Follow log of direct road from Barstow to Ballarat as far as mile 20.8. (See p. 182.)
- 20.8 Road forks. County sign. Follow road on right (north), which leads to Indian Spring, Leach Spring, and Hidden Spring. Road on left (northwest) leads to Crutts post office, Copper City (abandoned), Randsburg, Granite Wells, Lone Willow Spring, and Ballarat. Several roads branch from the right-hand road, but all of these should be avoided and the traveler should continue due north to a large "dry lake" flat.
- 25.0 South side of "dry lake" flat. Continue north across it. A road on right (northeast) leads across the flat to **Ausland ranch**, behind a lava butte, where **water** may be obtained, and thence to Goldstone mining camp. (See p. 190.)
- 26.4 North edge of clay flat. A road comes in on left (southwest). Continue north, avoiding branch roads on left and right. The main road leads directly toward the Eagle Crags, a prominent banded mountain.
- 31.0 Branch road comes in on right (southeast) from Goldstone and Ausland's ranch.
- 33.5 Junction with road leading approximately east and west. Geological Survey sign. **Water may be obtained at Indian Spring**, about 0.2 mile to left (west). The spring is hidden from the road but is about 50 feet north of it in a bouldery wash. (See Pl. IV.) Turn to right (east) for Leach Spring, Hidden Spring, and points in south Death Valley. The road on the left (west) leads to Copper City, Granite Wells, Blackwater Well, Atolia, and Randsburg. (See mile 72.2 of log on p. 180.) From this fork the road runs in an easterly direction to about mile 35.1, where it turns northeast, and farther on it turns north. The road north of this point is not traveled very much and may be in bad shape, especially after heavy rains.
- 38.7 Cross low divide and turn slightly east of north.
- 42.5 Cross a second divide and continue east of north, some distance beyond entering a large wash, in which the road may be obliterated. Descend this wash (which leads north).
- 48.1 Turn to right, leaving wash.

- 48.2 Faint tracks on right lead to **Myricks Spring**, 0.5 mile southeast, behind a low hill. Water may possibly be obtained here by digging in an old caved-in well, where salt grass is growing. Main road leads north-east.
- 53.4 Junction with east-west road in wash. Geological Survey sign. Turn sharply to left (west) down wash. Road on right (east) leads to Leach Spring, Silver Lake, Saratoga Springs, and points in south Death Valley. (See mile 51.2 of log on p. 173.)
- 53.8 Road turns to right (north) a short distance east of low hill on north side of road. Follow this road for Hidden Spring, Crystal Hills epsomite deposits, and Ballarat by way of Wingate Pass. The road that continues west leads to Granite Wells, Randsburg, and Ballarat by way of Lone Willow Spring. (See mile 52.8 of log on p. 176.) Log is given for road on right. This road leads in a general northerly direction up a wash. The road is generally good, but the grade is heavy. At about mile 57.0 several large boulders in the road must be passed carefully lest the underframe of the machine be damaged.
- 58.4 Cross divide and descend wash.
- 60.9 Turn to right out of wash and cross low hill, thence continuing more to right (northeast).
- 61.3 Road comes in on right from **Hidden Spring** (0.2 mile). Geological Survey sign. **This is the last certain watering place on the road to Ballarat for at least 40 miles**, and the traveler should replenish his supply. Crystal Hills camp, mentioned on the sign at this point, is not a reliable watering place. The road to the spring leads up a canyon to the right (southeast) for 0.2 mile and ends where two smaller canyons separate. Thence a trail leads up the left of these two canyons for about 200 yards to the spring, which is marked by a large willow tree. The water is good. From the junction at mile 61.3 the road leads northwest. The log does not include the distance to the spring.
- 61.8 Road turns to right (east of north) on a long straight stretch.
- 62.0 Avoid old tracks on left (northwest).
- 65.2 Road forks. Turn to left (northwest) a short distance beyond descending a canyon in clay hills. Road straight ahead (east of north) leads to Wingate Pass and thence to Death Valley. It is reported to be impassable in Wingate Pass. (See note at mile 70.1, below.)
- 66.1 Epsomite prospects on left. Continue down wash.
- 67.7 Road bends to left (northwest). Old tracks may continue north. In the next 2.5 miles there are several tracks made by a caterpillar tractor. These are badly cut up, and the best one should be followed.
- 70.1 Junction with east-west road. To the right this road leads down into Death Valley. It is said to be impassable beyond the first few miles. One might be able to descend eastward, but the grade is heavy and sandy and the traveler might have difficulty in returning. Turn to left (west).
- 76.3 Descend steep grade into Panamint Valley.
- 77.8 Junction with north-south road. Geological Survey sign. Turn to right (north) to Ballarat. This road is little traveled. For log of the road north of this point see mile 71.4 on page 183. Road on left (south) leads to Lone Willow Spring, Granite Wells, Randsburg, and Barstow. (See mile 25.1 of log on p. 184.)

**BALLARAT TO BARSTOW BY WAY OF HIDDEN SPRING AND INDIAN SPRING
(103 MILES).**

[For log of road in opposite direction see p. 186.]

This road is seldom used by travelers going between Ballarat and Barstow, but it is given as a unit in order to include several separated stretches connecting roads that are described on other pages. By uniting these into a single log the necessity of having several separate disconnected logs is obviated. So far as is known, no supplies can be obtained at Ballarat nor at any point on the road described in this log until Barstow is reached.

- 0.0 Ballarat. Follow the log of direct road to Barstow on page 184 as far as mile 25.1.
- 25.1 Branch road on left leads east. Geological Survey sign. Log is given by way of this road, leading east and south to Barstow by way of Hidden Spring and Indian Spring. Road straight ahead (south) leads to Lone Willow Spring, Granite Wells, Randsburg, and Barstow. (See p. 184.) On the Geological Survey sign at this place Crystal Hills camp is given as a watering place, but unless men are working there no water is obtainable. The nearest water on the road through Wingate Pass is at Hidden Spring, 16.5 miles. A short distance east of the fork the road ascends a very steep grade, ranging between 15 and 20 per cent. Heavily loaded machines will have difficulty on this grade. At the top of the grade the road continues eastward in Wingate Pass. At one or two points the road forks, but the branches unite in a short distance.
- 32.8 Road forks. Geological Survey sign. This sign gives mileage to Crystal Hills Camp, but water is not obtainable there unless someone is living at the camp. Follow road on right (south and then southeast) past low hill. Road straight ahead (east) down Wingate Pass leads to Death Valley, but it is reported to be impassable for automobiles beyond the first few miles. A machine might descend it without much difficulty, but coming westward the grade is steep and sandy, and trouble might be encountered. No water is obtainable on the road into Death Valley until Bennetts Wells are reached, a distance of 40 or 50 miles. Water at these wells may possibly be obtained only by digging. On the road to the right in the next 2.5 miles there are several tracks, made by a caterpillar tractor. These are all rough, and the best one should be followed.
- 35.2 Turn to right (south) up a wash.
- 36.8 Crystal Hills epsomite prospects on right. Continue up wash, turning to left (southeast) on emerging from hills.
- 37.7 Junction with straight road leading west of south. Turn to right. To the left this road leads to the Wingate Pass road into Death Valley. The latter is not passable for automobiles except for a short distance.
- 40.9 Old road comes in on right.
- 41.1 Road bends to left (southeast).
- 41.6 Road forks. Geological Survey sign. Road on left leads up a canyon for 0.2 mile to **Hidden Spring**. The spring is found by following a trail up the left of two short canyons about 200 yards from end of road. It is situated on the hillside and is marked by a large willow tree. From the fork follow right-hand road. Mileage does not include distance to Hidden Spring.
- 42.0 Cross low hill and continue in a southerly direction up a wash.

- 44.5 Cross divide and descend in wash. At about mile 45.0 several large boulders lie in the road, and these must be passed carefully lest the underframe of the car be damaged. The road follows down the wash and emerges onto an alluvial slope at about mile 46.3, down which it continues.
- 49.1 Junction with east-west road in wash a few feet east of low hill. Turn to left (east) up the wash. Road on right (west) leads to Granite Wells and Randsburg. (See mile 52.8 of log on p. 176.)
- 49.5 Road junction. Geological Survey sign. Turn sharply to right (south-west) for Indian Springs and Barstow. Left-hand road (east) leads to Leach Spring, Owl Holes, Saratoga Springs, Silver Lake, and points in south Death Valley. (See mile 51.2 of log on p. 173.) Log is given for right-hand road.
- 54.7 Faint tracks on right lead to **Myricks Spring**, 0.5 mile southeast, behind low hill, where water may possibly be obtained in an emergency by digging out an old caved-in well.
- 54.8 Road bends to left (south) up a wash. The road in this wash may be obliterated, but the traveler should continue approximately south, turning to the right out of the wash where it bends to the east, the road thence leading west of south to a saddle between low hills. Some difficulty may be encountered because of loose sand and gravel in this wash.
- 60.4 Cross low divide and continue slightly west of south.
- 64.2 Cross second divide.
- 67.8 Road bends in a westerly direction.
- 69.4 Road forks near rocky point on left. Geological Survey sign. Follow road on left (south) to Barstow. Right-hand road (to west) leads to Copper City, Blackwater Well, Atolia, and Randsburg. (See mile 72.2 of log on p. 180.) Water may be obtained at **Indian Spring**, 0.2 mile west of this fork. (See p. 186.)
- 71.9 Avoid road on left (southeast) to Goldstone. Also avoid branch roads to several ranches and continue in a southerly direction.
- 76.5 North edge of "dry lake" flat. Continue south across it, avoiding branch roads on left and right.
- 77.9 South edge of clay flat.
- 82.3 Junction with southeast-northwest road. County sign. This is the direct road from Ballarat to Barstow. Continue southeast on this road, following the log from mile 75.7 on page 185.

BARSTOW-GOLDSTONE.

BARSTOW TO LANES WELL AND GOLDSTONE (80 MILES).

[For log of road in opposite direction see p. 180.]

Several roads branch to the right of the Barstow-Ballarad road over which the traveler may reach Goldstone. One of these is the road described on page 186. All of the roads are coincident for the first 14 miles. The Goldstone camp was inactive in January, 1918, but there were rumors that it would open again. The road also serves several ranches in the Superior Valley.

- 0.0 **Barstow**. Post office on right. Follow log of road from Barstow to Ballarat as far as mile 13.8 on page 182.
- 13.8 Road forks. County sign. Follow road on right. Road on left leads to Crutts post office, Copper City, Ballarat, etc.
- 14.0 Road forks. County sign. Road on right leads to Lanes Well. Road on left leads to Goldstone direct. Log is given for both roads.

Left-hand road, direct to Goldstone.

- 14.9 Road forks. Follow road on right for Goldstone. This place can also probably be reached by the left-hand road, but it was not traversed by the writer.
- 17.9 Road crosses from right to left from Lanes Well.
- 18.3 **Williams Well** on right side of road. **Water of poor quality** obtainable from this well by windlass and bucket. A short distance north of well a road comes in on left. Continue east of north.
- 19.6 Road comes in on right from Lanes Well. Road enters small canyon and bends to left.

Right-hand road, to Lanes Well.

- 18.0 Road junction (three branches). A road leads to right down a canyon to **Lanes Well**, 0.1 mile. **Water of fair quality** is obtainable. From the well a little-used road continues east down the canyon to Coyote "Dry Lake." From road junction at mile 18.0 a road leads north of west, joining left-hand road about mile 19.2 (or 17.9 of left-hand log). A road also leads approximately north, joining the other road at about mile 20.0 (or mile 19.6 on left-hand log).

22.5 Cross divide.

23.1 Avoid road on right.

23.5 Road comes in on left. This probably is an alternative road from Barstow, but it was not traversed by the writer.

23.6 Avoid road on right. Also avoid roads branching to west.

25.6 Avoid road on left (west) and turn slightly to right.

26.8 Turn north on section line.

28.0 **Ausland ranch**. **Water obtainable from well only if someone is at ranch to operate the pump** unless water is left standing in storage tank. Roads come in on the left (southwest) from Crutts post office and other points on the main Barstow-Ballarot road. Continue north.

28.4 Road bends to right (northeast) and a road comes in from southwest.

29.1 Road comes in on left from Indian Spring.

30.0 Goldstone. In November, 1917, there were a number of buildings here and three or four miners, but later the camp was reported to have been abandoned. **No water obtainable at the camp unless some one is living there.** From Goldstone a road leads eastward to the Barstow-Silver Lake road, but it is said to be impassable for automobiles. The exact course of this road is not known, and it is shown only approximately on the map.

GOLDSTONE TO BARSTOW (80 MILES).

[For log of road in opposite direction see p. 189.]

The log of this road is given because several roads join it, coming from homesteads and placer camps between Barstow and Goldstone, and travelers may find the description useful. It is not as detailed as the log in the opposite direction because most persons will usually come into the region from Barstow and will know the road.

0.0 Goldstone. Go west of south toward a pass between low hills.

0.8 Avoid branch road on right (west) to Indian Springs and to ranches in Superior Valley.

- 1.5 Turn to left (south) on section line. A branch road on right (south-west) leads to Crutts post office and other ranches in Superior Valley.
- 1.9 **Ausland ranch.** Water obtainable here only if someone is living at the ranch to operate pump, or water may be left in storage tank. A road leads west and southwest from Ausland ranch to Crutts post office and other ranches. Continue south.
- 3.1 Turn to right (west of south).
- 4.3 Road comes in on right, turn to left (southeast).
- 6.3 Old road comes in on left.
- 6.4 Avoid branch road on right. This may be an optional road to Barstow, but it was not traversed by the writer and its course is not known. Continue east of south up a short canyon.
- 6.8 Road comes in on left.
- 7.4 Cross divide and continue east of south down a gulch.
- 10.3 Avoid branch road on left and turn to right in a southwesterly direction. The left-hand road probably leads along the west side of a series of hills to Lanes Well. It was not traversed by the writer.
- 11.5 Avoid branch road on right.
- 11.6 **Williams Well** on left. Water of poor quality obtainable from this well by windlass and bucket. Turn slightly to left and later to right, slightly west of south.
- 12.0 Road crosses from northwest to southeast, leading to Lanes Well. (See p. 190.)
- 15.0 Road comes in on right. Continue south.
- 16.0 Road comes in on left from Lanes Well (4.2 miles). County sign. (See reverse log, p. 190.)
- 16.3 Road comes in on right. County sign. This is the main road between Barstow and Ballarat. Continue south, following log from mile 82.6 on page 185.

BARSTOW TO COOLGARDIE CAMP AND CONNECTING ROADS.

A road branches to the left from the main road between Barstow and Ballarat at a point 13.9 miles north of the former place. (See log, p. 182.) This road leads to the old Coolgardie placer camp, 19.2 miles from Barstow. In October, 1917, the camp was abandoned, except for a single miner who was working the placer deposits, and as long as he was there water was obtainable in case of emergency. From the camp a little-used road leads southwest to Black's ranch. This is reported to be very sandy in spots. A road also leads north from the camp. The old **Murphy Well**, 2.6 miles farther north, is entirely caved in, and water is not obtainable at this point. From the **Murphy Well** a road leads east and then north to ranches in Superior Valley, at some of which water was obtainable in 1918. Water was not obtainable at the **Slocum Well**, 8 miles north of **Murphy Well**, the pump in the well being out of order and the water standing nearly 100 feet below the surface.

BARSTOW-SILVER LAKE.

BARSTOW TO SILVER LAKE (82 MILES).

[For log of road in opposite direction see p. 194.]

This route is used by travelers going to Silver Lake and thence to Valley Wells, Cima, or Nipton, Calif., or to Goodsprings and other points in southern

Nevada. All these places, except Silver Lake, may also be reached by going east on the National Old Trails road to Fenner or Goffs and then turning north. The latter route is 30 to 65 miles longer to the different points, but it has the advantage that it lies close to the railroad for most of the distance and that several supply points are passed, whereas the route by way of Silver Lake is across the open desert. It is also used to reach Zabriskie and Tecopa, either by way of Silver Lake or by way of Saratoga Springs and Confidence mill, in south Death Valley. (See p. 196.) A road from Daggett connects with this route 1.4 miles east of Garlic Spring (see mile 37.3 of this log). Supplies other than water are obtainable at Silver Lake and the other towns mentioned, but the distance between these places is great and the route is through entirely uninhabited country, so that **the traveler should have plenty of gasoline and oil and be prepared to meet any emergency which may arise.** The road for most of the distance is fair to good, but heavy sand is encountered in one or two places.

- 0. 0 Barstow post office. Go west on main street of town. (See fig. 3, p. 121, for diagram of roads leading from Barstow.)
- 0. 2 Turn to right (north) and cross railroad. On north side of tracks turn to right (east).
- 0. 6 Turn to left (north) and cross bridge over Mohave River.
- 1. 0 Turn to left (west).
- 1. 1 Turn to right (north).
- 1. 5 Road intersection. Automobile Club sign. Road on left (west) leads to Hinkley, Kramer, Randsburg, and Mojave, and to Bakersfield and San Francisco through Tehachapi Pass. (See p. 150.) Road straight ahead leads to Silver Lake, Goodsprings, and points in south Death Valley, and to Randsburg and Ballarat by way of Crutts post office and Copper City. Continue straight ahead.
- 1. 6 Branch road on right (east) leads to near-by ranches.
- 5. 5 Branch road on left leads northwest just north of summit of pass.
- 6. 9 Branch road on left leads north of west.
- 7. 8 Road forks. Geological Survey sign. Road on left (east of north) leads to Crutts post office, Goldstone, Indian Spring, Copper City, Granite Wells, Randsburg, and Ballarat (see p. 182); road on right (east) leads to Paradise Springs, Garlic Spring, Silver Lake, Goodsprings, Cave Springs, Saratoga Springs, Zabriskie, and Tecopa. Take right-hand road.
- 10. 9 Crossroads. Road on right (south) leads to Daggett (10 miles); road on left leads to Crutts post office, Copper City, Randsburg, Ballarat, etc. (See p. 213.) Continue straight ahead.
- 12. 0 Road comes in on right (southwest) from Daggett (10 miles).
- 16. 9 Branch road on right leads east.
- 21. 8 Branch road on left (north) leads to Paradise mine and mill.
- 22. 9 Old road crosses from northwest to southeast.
- 23. 1 Branch road comes in on left (southwest).
- 23. 3 Branch road on left leads west.
- 23. 8 Branch road on left (northwest) leads up a wash to **Paradise Springs** (1.5 miles). Geological Survey sign. The springs are reached after crossing a low divide. The water may be obtained at a barrel sunk in the ground near the outer edge of a flat covered with grass or from trenches near the low hills that rise from this flat. The water is warm, varying from 84° F. to 106° F., but otherwise it is of good quality for drinking. Mileage does not include side trip to spring.

27. 4 Cross low summit and at mile 27.8 road enters a wash up which it follows for 0.2 mile, later turning to right out of the wash.
35. 5 Old road enters on left (northwest) from Goldstone. This road is ordinarily not passable for automobiles.
35. 8 **Garlic Spring.** Water at trough on left. Spring is about 100 yards north of road at foot of hill. Although the water is stated in some reports to be poor, analysis shows it to be of fair quality for drinking.
36. 1 Branch road on right (southeast) leads to Langford Well and Bitter Spring. (See p. 215.) Continue on left-hand road.
36. 4 Old road branches to right. Continue on left-hand road.
37. 3 Road junction. Geological Survey sign. Road on right (south) leads to Langford Well, Coyote Well, Yermo, and Daggett. (See p. 215.) Turn left (north) up a narrow wash.
40. 9 South edge of "dry lake" flat; road goes east of north across the flat.
42. 5 Old road comes in on left (southwest) at north side of clay flat. This leads to Goldstone but is usually impassable for automobiles.
50. 4 Old road on left branches north.
52. 4 Summit of Granite Mountains. Road turns to right (east) down a wash, and at foot of mountains leads northeast across a large valley.
55. 7 Old road branching to left (north) is a short cut to road to Drinkwater Spring, Desert King Spring, Leach Spring, etc.
58. 6 Old road comes in on right (southeast). Geological Survey sign. Main road just beyond goes through a low pass.
59. 3 Main road turns to right (northeast). Branch road on left (north) is a short cut to the road to Leach Spring and Randsburg.
59. 8 Road comes in on left (west). Geological Survey sign. The road on left leads to Drinkwater Spring, Two Springs, Desert King Spring, Leach Spring, and Randsburg. (See mile 22.4 of log on p. 175.)
59. 9 Road forks. Geological Survey sign. Road on left (northeast) leads to Cave Springs and Saratoga Springs and to Zabriskie²³ and Tecopa by way of Death Valley. (See p. 197.) Road on right (east) leads to Silver Lake, Valley Wells, and Goodsprings, and also to Zabriskie and Tecopa by way of Pahrump Valley. Turn to right.
62. 1 Branch road comes in on left (northwest).
70. 2 Turn to left. (east) at end of long straight stretch, and in a short distance enter wash in a low canyon.
77. 0 Roads cross diagonally. Geological Survey sign. Road straight ahead leads to Silver Lake. Road on right (southwest) is from Bitter Spring and Red Pass and road on left (northeast) is from Riggs, Saratoga Springs, and south' Death Valley. (See p. 217.) If the grade about 2 miles farther east is too steep for heavily laden machines bound for Silver Lake, this town may be reached by following the left-hand road northeast down the valley and around the mountain lying northwest of Silver Lake.
78. 2 Road comes in on right (southwest).
79. 5 Road forks near top of hill. Road on right, although shorter, is very sandy and should be avoided. Road on left leads along edge of mountain and is the better of the two.
80. 0 Branch road goes to left. In wet weather it may be necessary to follow this road around the north end of the Silver Lake clay flat.
80. 3 Roads join again near edge of "dry lake" flat. Turn east across clay flat.

²³ For note on choice of roads to Zabriskie and Tecopa see p. 196.

82.2 Silver Lake. Railroad crossing. Store and depot 0.1 mile to left. **Water, gasoline, oil, general supplies, meals, and sleeping accommodations.** From Silver Lake roads lead south to Soda Lake station (see p. 205); east to Valley Wells, and Nipton (see pp. 209, 212), to Goodsprings (see p. 205), and to Tecopa and Zabriskie by way of Pahrump Valley (see p. 208); and north to Saratoga Springs and Owl Holes, and to Tecopa and Zabriskie by way of Death Valley (see p. 202).

SILVER LAKE TO BARSTOW (82 MILES).

[For log of road in opposite direction see p. 191.]

This road is used by persons going from Silver Lake and points east thereof to Barstow, San Bernardino, and Los Angeles. Many persons pass through Silver Lake from Goodsprings and other points in Nevada (see pp. 205, 207), or from Nipton, Cima, and Valley Wells (see pp. 209-212). For about the last two-thirds of the distance the road is the same as that used by persons going from points in south Death Valley to Barstow. **Supplies other than water are not obtainable between Silver Lake and Barstow,** a distance of 82 miles, and the traveler should carry plenty of gasoline and oil and be prepared to make minor repairs. The road for most of the distance is fair to good, but heavy sand or gravel is encountered in one or two places that are mentioned in the log.

- 0.0 Silver Lake.** Railroad crossing 0.1 mile south of station. Go west, crossing old railroad grade at east edge of "dry lake" flat, and thence across the clay flat. In wet weather it is necessary to follow a road around the north edge of the clay flat, keeping south of the low hills north of the town.
- 1.9** West edge of clay flat. Road forks. A straight road leads northwest up an alluvial slope, but it is very sandy and should be avoided, as many machines have been stalled. Follow road on right along the edge of the rock hills, joining the left branch at top of hill.
- 2.2** Road comes in on right. This is the road around north end of lake and should be used in wet weather.
- 2.7** Junction with road on left, the sandy road which was avoided at mile 1.9. Descend steep grade and turn northwest on long straight road.
- 4.0** Avoid branch road on left (southwest).
- 5.2** Roads cross diagonally. Geological Survey sign. Continue straight ahead (northwest). Road on left (southwest) leads to Bitter Springs by way of Red Pass. (See p. 217.) A branch road leads from it to the Barstow road several miles beyond, but it is seldom used. Road to right (northeast) leads to Riggs and points in south Death Valley. The main road leads northwest up the alluvial slopes, several miles beyond, following up a wash in which sandy stretches may be encountered.
- 12.0** A short distance after road emerges from wash in canyon it bends to right to a long straight stretch leading northwest for several miles.
- 20.1** Avoid branch road on right (northwest).
- 22.3** Road junction. Geological Survey sign. Continue southwest. Road on right (northeast) leads to Cave Spring, Saratoga Springs, and points in Death Valley. (See mile 59.9 of log on p. 197.) The distance to Daggett on the sign at this place and at mile 22.4 should be 55 miles instead of 61 miles.

22. 4 Road forks. Geological Survey sign. Follow road on left (southwest). Road on right (west) leads to Drinkwater Spring, Desert King Spring, Leach Spring, and Randsburg. (See p. 175.)
22. 9 Branch road comes in on right (from northwest) from the road to Leach Spring. Main road turns to left (southeast) between hills.
23. 6 Road forks. Geological Survey sign. Follow road on right (southwest). Road on left (southeast) is an old road to Silver Lake, which is seldom used. (See note at mile 5.2.)
26. 5 Old road comes in on right (north).
29. 2 Road bends to right (west) and ascends slope to summit of Granite Mountains (29.8), then turns to left (west of south) down mountain slope and across a wide valley.
31. 8 Old road comes in on right (north).
39. 7 North edge of clay flat of Bicycle "Dry Lake." Faint road branches to right (southwest). This leads to Goldstone, but it is probably impassable for automobiles. Continue across clay flat.
41. 3 South edge of clay flat. A short distance beyond road bends to left (south) and ascends a narrow rocky gulch.
44. 9 Road forks. Geological Survey sign. Follow road on right (west). Road on left (south) leads to Langford Well, Coyote Well, Yermo, and Daggett. (See p. 215.)
45. 8 Old road comes in on left (east).
46. 1 Road comes in on left (from east) from Langford Well and Bitter Spring. (See p. 215.)
46. 4 **Garlic Spring.** Water at trough on right. The spring is about 100 yards north of road at foot of hill. Although the water from this spring has been reported in several publications as bad, analysis shows it as of fair quality, and it can be used without hesitation. Continue southwest.
46. 7 Avoid old branch road on right (west), which leads to Goldstone but which is probably impassable for automobiles.
54. 0 (approximate) Road turns to left (south) down a wash for 0.2 mile and then turns to right (southwest) out of it, crossing low summit at mile 54.6.
58. 4 Road comes in on right (from northwest). Geological Survey sign. This road leads to **Paradise Springs** (1.5 miles), where water may be obtained. (See p. 192.) Continue south.
58. 9 Branch road comes in on right.
59. 1 Avoid branch road on right (southwest) toward Paradise Mountain.
59. 3 Old road crosses from northwest to southeast.
60. 4 Road comes in on right (from north) from Paradise mine and mill.
65. 3 Old road comes in on left (east).
70. 2 Road forks. Follow road on right (southwest). Road on left (south) leads to Daggett (10.5 miles). (See p. 213.)
71. 3 Crossroads. Continue straight ahead (west). Road on left (east of south) leads to Daggett (10 miles); road on right (northwest) leads to Crufts post office, Goldstone, Granite Wells, Randsburg, and Ballarat. (See p. 213.)
74. 4 Road comes in on right (from northeast). Geological Survey sign. Turn southwest. Right-hand road leads to Crufts post office, Goldstone, Granite Wells, Randsburg, and Ballarat. (See p. 182.)
75. 3 Branch road comes in on right (north of west).
76. 7 Branch road comes in on right (northwest). Just beyond road descends through small canyon.

80. 6 Branch road on right leads to ranches. Continue straight ahead (south).
 80. 7 Road comes in on right (west). Automobile Club sign. Continue south.
 The road on right leads to Hinkley, Kramer, Randsburg, Mojave, Bakersfield, and San Francisco. (See p. 150.)
 81. 1 Turn to left (east).
 81. 2 Turn to right (south) and a short distance beyond cross bridge over Mohave River.
 81. 6 Turn to right (west) along station at Barstow. (See fig. 3, p. 121, for diagram of roads leading into Barstow.)
 81. 9 Turn to right (south) across railroad. On south side of tracks turn to left (east) on main street of Barstow.
 82. 2 **Barstow.** Post office on left. Hotels, garages, and general supplies. From Barstow the National Old Trails road leads east to Ludlow, Needles, and the Eastern States (see p. 121), and south to Victorville, San Bernardino, and Los Angeles (see p. 127).

BARSTOW-SARATOGA SPRINGS-SHOSHONE.

BARSTOW TO SARATOGA SPRINGS (75 MILES) AND SHOSHONE (116 MILES) BY WAY OF SOUTH DEATH VALLEY.

[For log of road in opposite direction, see p. 199.]

This route is the same as the road to Silver Lake for the first 59.9 miles. It is used by travelers going to mineral prospects in the south Death Valley region and to Zabriskie, Tecopa, Shoshone, and other points on the Tonopah & Tidewater Railroad. Formerly two direct routes were used to reach Zabriskie, Tecopa, and Shoshone. One route led from Saratoga Springs north along the east side of south Death Valley a short distance and then northeast through a pass and past the Ibex mine to Zabriskie and Tecopa. The other led east of Saratoga Springs and up Amargosa River past Sperry and the China ranch. In the later part of 1918 both of the roads were reported to have been washed out and to be impassable for automobiles. The former is filled with deep sand on a heavy grade, and the latter is soft and treacherous in spots in Amargosa Canyon. To reach Tecopa and points farther north by automobile it is therefore necessary to follow roundabout routes. One goes to Silver Lake, thence northeast to Pahrump Valley, and west to Tecopa. (See p. 208.) The alternative route is by way of Saratoga Springs and thence north in south Death Valley to the old Confidence mill, thence northeast over the Amargosa range on the Carbonate mine caterpillar road to Zabriskie and Tecopa or to Shoshone. The latter route is about 60 miles shorter than the former, but **from Barstow to Shoshone or Zabriskie, a distance of 116 miles, there is no place where the traveler can get needed supplies other than water.** The Death Valley route is entirely through uninhabited country, and the traveler is most of the time from 25 to 50 miles from any point where he can obtain help in case of breakdown or other accident. The route to Tecopa by way of Silver Lake and Pahrump Valley is considerably longer, but supplies can be obtained at Silver Lake and, by a short side run, at Goodsprings, and several ranches are passed. If the Death Valley route is used, the traveler should carry more than the amount of gasoline which would ordinarily be required for the distance, as the road is sandy and grades are steep in several places.

The log from Saratoga Springs to Shoshone and Zabriskie is based on a road traverse made by L. F. Noble, of the United States Geological Survey.

- 0.0 **Barstow** post office. Follow entirely the log of the Barstow-Silver Lake road as far as mile 59.9. (See pp. 192-193.)
- 59.9 Road forks. Geological Survey sign. Road on right (east) leads to Silver Lake, Valley Wells, and Goodsprings. This is the long road to Tecopa and Zabriskie (118 miles from this point, or nearly 180 miles from Barstow. (See p. 208.) Road on left (northeast) leads to Cave Springs, Denning Spring, Saratoga Springs, Owl Holes, Zabriskie, Tecopa, and Shoshone by way of south Death Valley. Log is given for left-hand road.
- 61.6 Pass old Avawatz camp.
- 62.4 Turn to right along hillside and cross summit, descending immediately into the head of Cave Springs Wash.
- 64.4 **Cave Springs** in short tunnels on right side of canyon. Geological Survey sign. **Water is good.**
- 65.9 Branch road on left (northwest) leads out of wash to Denning Spring (3.1 miles). Geological Survey sign. The main road continues north down wash. The road to **Denning Spring** leads northwest down the alluvial slope to a wash that turns north through a canyon about 3 miles from the main road. Just before the canyon is reached, clay hills lie on the south side of the road, and in these are two or three caved-in springs. A well containing water of apparently good quality is at the west base of the hills, about one-tenth of a mile south of the road, up a large wash. From Denning Spring a road leads north through the canyon and then northeast, coming into the main road at mile 73.3.
- 73.1 Road forks, south side of Amargosa Valley. Geological Survey sign. Road on right (east) leads to Silver Lake and Riggs. The Geological Survey sign at this point directs the traveler eastward for Zabriskie, but since the sign was erected the road to that place by this route has been washed out, and to reach Zabriskie and Tecopa it is necessary to continue north through Death Valley, or go by way of Silver Lake. Continue north for Saratoga Springs, Shoshone, Zabriskie, Tecopa, and points in Death Valley.
- 73.3 Cross east-west road. This is the road from Denning Spring.
- 73.7 Old road comes in on left (southeast).
- 73.8 Crossroads. Geological Survey sign. Road straight ahead leads to **Saratoga Springs (2 miles)**. Road on right (southeast) leads to Riggs and Silver Lake. (See mile 82.8 of log on p. 204.) Road on left (north of west) leads to Owl Holes, Leach Spring, and Randsburg, and to Confidence mill and other points in Death Valley, and to Tecopa, Zabriskie, and Shoshone. **Travelers going by this route to Death Valley points or to the three towns mentioned should run to Saratoga Springs to obtain water, as no water is available until Bradbury Well or Rhodes Spring is reached, a distance of 25 miles.** Heavy sand and long grades are encountered, and a car will use a considerable amount of water. The springs are located at the extreme southwest tip of the mountains on the north side of the valley. The water is of poor quality, but it is used by travelers without apparent harm. On leaving Saratoga Springs do not attempt to go west across the Amargosa bottom on the old road which begins at the springs, as it is treacherous, but return to the crossroads at mile 73.8. Set the speedometer accordingly and turn west.
- 76.4 Road comes in on right (east) across Amargosa bottom from Saratoga Springs. This road is soft and one should not attempt to cross it with an automobile.



FIGURE 4.—Panoramic sketch of east side of Death Valley north of Confidence mill, showing course of the Saratoga Springs-Shoshone road (broken line), from the mill to Rhodes Wash. *M*, Confidence mill. *W*, Large wash northeast of Confidence mill, up which a road formerly led to Zabriskie. This road is good near the mill, but is impassable in the mountains and should be avoided. *R*, Rhodes Wash. *E*, Eagle Mountain. The caterpillar road from the Carbonate mine to Zabriskie leads up the alluvial slope at the extreme left of the picture and behind Eagle Mountain, joining the road from Confidence mill in Rhodes Wash. From photograph by L. F. Noble.

76.9 Road forks. Geological Survey sign. Road on left (west), toward clay hills, leads to Owl Holes, Leach Spring, and Randsburg. (See mile 32.7 of log on p. 203.) Follow right-hand road (northwest) for Confidence mill, Death Valley, Shoshone, Zabriskie, and Tecopa.

78.3 Dim tracks branch to left.

79.5 Turn sharply to left (west) and go to west of Round Mountain. Do not attempt to go to east of mountain.

79.8 Dim tracks branch to left (south and southwest). In the next mile deep sand is encountered. This may possibly be avoided by following tracks a little to the right of the wash, close to the west foot of Round Mountain.

86.5 Cross channels of Amargosa River.

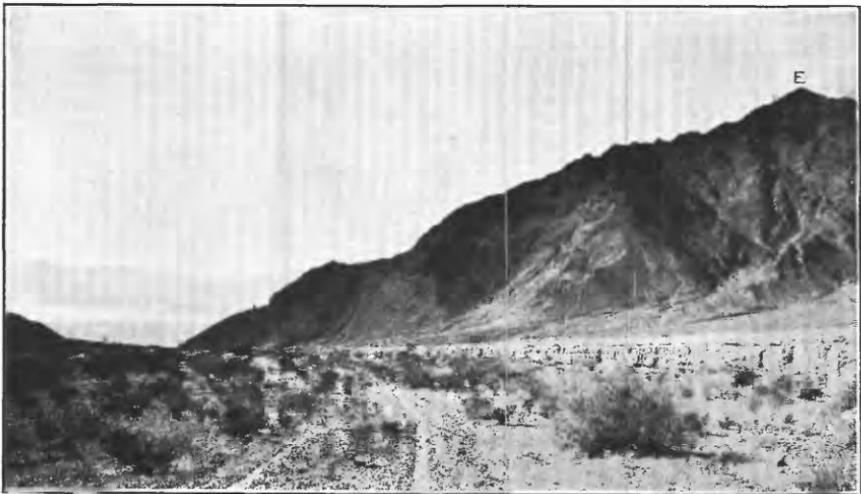
90.8 Avoid road to right (north-east) on south side of old Confidence mill. This road, which formerly led to Zabriskie, is well marked near the mill, but it is washed out in the mountains. Main road bends to left (west) of Confidence mill. After passing mill, avoid tracks to left down Death Valley. These tracks lead to an old road down the valley, now washed out. Travelers who wish to reach points farther north in Death Valley should not attempt to continue down the valley, but should follow the main road up Rhodes Wash to the Carbonate mine caterpillar road at mile 96.0 and then turn northwest down into the valley again. (See map, Pl. XI, and fig. 4.)

91.3 Avoid tracks on left and turn to right (due north) up alluvial slope to a pass between two mountains.



A. VIEW SOUTHWEST DOWN RHODES WASH FROM A POINT BETWEEN BRADBURY WELL AND RHODES SPRING, CALIF.

Showing location of roads to the Carbonate mine, Rhodes Spring, and Confidence mill. The road to Rhodes Spring branches from the main road at Point of Rocks (P). The road to Confidence mill and Saratoga Spring leads down Rhodes Wash below Point of Rocks. E, Eagle Mountain. Photograph by L. F. Noble.



B. VIEW SOUTHWESTWARD DOWN RHODES WASH, CALIF.

Showing road to Confidence mill and Saratoga Springs. The caterpillar road to the Confidence mine leads to the right of Eagle Mountain (E). Owlshead Mountains in the distance. Photograph by L. F. Noble.

- 96.0 Road comes in on left (southwest). This is the Carbonate mine caterpillar road to Death Valley. Travelers following it should carry plenty of water, if necessary running northeast up the main road to Bradbury Well (2.4 miles) or to Rhodes Spring. No water is obtainable in Death Valley until Bennetts Wells are reached, a distance of about 30 miles, and it may be necessary to dig for water at that point. Continue northeast up Rhodes Wash.
- 97.4 Branch road on left (northeast) near a prominent rock point leads to **Rhodes Spring**, 1.5 miles. (See Pl. XVIII, A.) Main road goes east. Water should be taken here or at Bradbury Well for car radiator as the road continues upgrade for 7 miles. Good water usually can be obtained at Bradbury Well, 1 mile farther east, near the road, and the traveler will not need to turn off to Rhodes Spring.
- 98.4 **Bradbury Well**, on right side, in small wash 400 or 500 feet from road. The well is reached by going up a small open wash about 0.2 mile east of a point of rocks to some mesquite bushes, surrounded with camp litter, and then about 200 feet west to another small wash. (See Pl. XVII.) A path leads to the well. The water is apparently of good quality.
- 104.4 Cross summit.
- 104.6 Trail on right (east) leads to **Salsberry Spring**, about 0.5 mile. It is reported that this spring is not always dependable.
- 106.8 Branch road continues straight ahead. Main road bends to right (east).
- 108.5 Crossroads. Road going northeast leads to Shoshone. Road going southeast leads to Zabriskie and Tecopa. Road going to northwest leads to Greenwater and Furnace Creek. Mileage is given to both Shoshone and Zabriskie.

To Shoshone (northeast road).

- 109.4 Old roads come in on left (west) and main road bends to right (east).
- 115.3 Road intersection on west side of railroad. Turn to right (south) parallel to track.
- 116.9 **Shoshone**. Water, meals, and supplies.

To Zabriskie (southeast road).²⁴

- 110.6 Avoid branch road on right (southeast).
- 114.6 Road comes in on right (west) and main road bends to left (east).
- 116.5 **Zabriskie**. In 1918 water, meals, and supplies were obtainable at Zabriskie, but in May, 1919, it was reported that the town had been abandoned. From here a road leads south to Tecopa (see p. 208) and east to Pahrump Valley. Water is obtainable at Tecopa. These roads were not traveled and logs are not given for them.

SHOSHONE AND ZABRISKIE TO SARATOGA SPRINGS AND BARSTOW BY WAY OF SOUTH DEATH VALLEY (116 MILES).

[For log of road in opposite direction see p. 196.]

This road is used principally for travel between prospects in south Death Valley and Barstow, but it is occasionally used by persons going to Barstow from Shoshone, Zabriskie, Tecopa, and near-by points. Formerly two direct

²⁴ Mileage on road to Zabriskie is scaled from the topographic map.

routes led from these points southward to Barstow, but both of these are now reported to be impassable for automobiles, and it is necessary to use roundabout routes. (See p. 196 for note on the possible routes and the advantages of each.) If the traveler goes by way of Confidence mill in Death Valley he should carry plenty of gasoline and full repair equipment. The distance to Barstow is 116 miles and **no supplies other than water are obtainable** until that place is reached. For most of the distance the traveler is 25 to 50 miles from any point where help may be obtained in an emergency.

The log from Shoshone to Saratoga Springs is based on a traverse made by L. F. Noble, of the United States Geological Survey. For the first 8 miles two logs are given, one for the road starting at Zabriskie and one for the road starting at Shoshone. The mileage from Zabriskie is scaled from the topographic map.

From Zabriskie.

- 0.0 **Zabriskie.** Go west.
- 1.9 Road forks. Follow road to right (northwest) on caterpillar road.
- 5.9 Branch road comes in on left (east of south).
- 8.0 Road forks (three branches). Follow road on left (west). Road straight ahead (northwest) leads to Greenwater ranch and Furnace Creek. Road on right (northeast) is road from Shoshone.

From Shoshone.

- 0.9 **Shoshone.** Go north along west side of railroad.
- 1.6 Road forks. Turn to left (west), leaving railroad.
- 7.5 Old road branches to right and main road bends to left (southwest).
- 8.4 Irregular crossroads. Cross northwest-southeast road and continue west. This is a junction with road from Zabriskie (from southeast). Road on right (northwest) leads to Greenwater ranch and Furnace Creek. Set speedometer to 8.0 to correspond with log of road from Zabriskie.

- 8.0 Junction of roads from Zabriskie and Shoshone. Go west up alluvial slope toward varicolored hills.
- 9.7 Turn to left (southwest) up wash.
- 11.9 Trail on left (east) leads to **Salsberry Spring** (0.5 mile). It is reported that the flow of this spring is small and that it can not always be depended upon.
- 12.1 Cross Salsberry summit and descend across a long, open valley leading westward.
- 18.1 **Bradbury Well**, on left side of road, in a small wash 400 or 500 feet south of the road. (See description of well, p. 199, and Pl. XVII.) This is about one-fifth of a mile east of a small point of rocks on the south side of the road. **Bradbury Well and Rhodes Spring** (see mile 19.0) are the last watering places before Saratoga Springs is reached, a distance of 25 miles, with heavy sand in places.
- 19.0 Road comes in on right (northeast) from **Rhodes Spring** (1.5 miles), nearly opposite prominent point of rocks on south side of road. (See Pl. XVIII, A.)
- 20.5 Road forks. Follow road on left (west of south) down a narrow wash (Rhodes Wash), later continuing down a long alluvial slope. (See Pl. XVIII, B.) Road on right (west) across a hill is the caterpillar

road leading to the Carbonate mine, on the west side of Death Valley. No water is obtainable on this road until Bennetts Wells are reached, a distance of about 30 miles. At this place it may be necessary to dig to obtain water. This road has not been traversed and no log is given for it.

- 25.2 Old road comes in on right (northwest) near bottom of valley. Turn to left (southeast) to old Confidence mill.
- 25.7 Road comes in on left (from northeast) a short distance south of Confidence mill. Continue south on east side of valley.
- 30.0 Cross channels of Amargosa River to west side of valley.
- 35.7 Road leads along west side of Round Mountain (a large hill on the side of the valley). In the next mile deep sand is encountered. This may possibly be avoided by following tracks on the left of the wash, close to the west foot of the mountain. Do not attempt to go around the east side of the mountain.
- 36.7 Avoid dim tracks straight ahead (south) and turn sharply to left (east) past south end of Round Mountain. Faint tracks also branch to right (west).
- 38.2 Faint tracks come in on right (west). Main road here is leading southeast along west side of valley.
- 39.6 Road comes in on right (west). Geological Survey sign. Continue southeast. Road on right leads to Owl Holes, Leach Spring, and Randsburg. (See mile 32.7 of log on p. 203.)
- 40.1 Old road branches to left (east). This road is a short cut to Saratoga Springs, across the Amargosa bottom, but it is soft and treacherous and no one should attempt to cross it with an automobile.
- 42.7 Crossroads. Geological Survey sign. Turn to right (south). Road on left (north) leads to **Saratoga Springs** (2 miles), at west end of low point of mountain. Unless the traveler has plenty of water he should run to Saratoga Springs for a sufficient supply, as the next 10 miles to Cave Springs is all uphill, with a heavy grade and sand in places. The water is of poor quality, but it is used for drinking by travelers without apparent bad effects. Road straight ahead (east and then southeast) leads to Silver Lake (30 miles). (See mile 82.8 of log on p. 204.) If the traveler has not sufficient gasoline to reach Barstow (75 miles), he should go to Silver Lake. The log from this point is given for the road leading south to Barstow by way of Cave Springs, Garlic Springs, and Paradise Springs.
- 42.8 Avoid branch road on right (southwest).
- 43.2 Cross east-west road.
- 43.4 Road comes in on left (east). Geological Survey sign. Main road bends to right (southwest) from this point and ascends long grade of Cave Springs Wash. The road on the left leads to Silver Lake. It formerly also led to Zabriskie by way of a road along Amargosa River, but that road is now impassable.
- 50.6 Road comes in on right (northwest) from **Denning Spring**, 3 miles. (See p. 197.) Geological Survey sign. Continue south.
- 52.1 **Cave Springs** in short tunnels on left side of canyon. Geological Survey sign. Continue south up canyon.
- 54.1 Cross summit.
- 54.9 Pass old Avawatz camp (abandoned).
- 56.6 Road comes in on left (from east). Geological Survey sign. Continue southwest. The road on the left leads to Silver Lake. (See mile 59.9

of log on p. 193.) Continue southwest. The log of the road from this point is the same as that of the Silver Lake-Barstow route, and the speedometer should be set to mile 22.3 to agree with the log of the latter route on page 194.

116.5 Barstow.

SILVER LAKE-SARATOGA SPRINGS-OWL HOLES-RANDBURG.

SILVER LAKE TO SARATOGA SPRINGS, SOUTH DEATH VALLEY, OWL HOLES, AND LEACH SPRING.

[For log of road in opposite direction see p. 203.]

This route is used by travelers going to mines and prospects in the south Death Valley region. It is also used by some to reach Zabriskie, Tecopa, and other points on the Tonopah & Tidewater Railroad. Owing to the bad condition of the road for the first 30 miles, however, travelers going to the latter points from Silver Lake often go by way of Francis Spring, the old Sandy mill, and Pahrump Valley (see p. 208), although this route is nearly 20 miles longer than that by way of Death Valley. The Death Valley route is also occasionally used by travelers bound for Randburg, but the shorter route by way of Two Springs and Desert King Springs, with which the Owl Holes road joins east of Leaches Point, is preferred. (See p. 174.)

- 0.0 **Silver Lake.** Railroad crossing at south end of town. Go north along east side of railroad.
- 1.6 Cross to left (west) side of railroad and turn north along it. A road continues north on east side of track to Riggs. A road comes in from Silver Lake on west side of railroad. A short distance west of railroad a road branches on left (west) to valley.
- 2.9 Old road branches to right (north). Main road leads left (northwest) away from railroad.
- 6.8 Road comes in on left (south), near bottom of valley.
- 10.6 (approximate) South end of "dry lake." Ordinarily the road leads directly across the clay flat, but in wet weather it may be necessary to go around the west side of the flat.
- 10.9 Cross east-west road on clay flat.
- 13.3 Road comes in on right (southeast) from **Riggs station** (5.5 miles) near northwest corner of "dry lake." Geological Survey sign. **Water at Riggs.**
- 23.9 Avoid branch road on left (southwest). Geological Survey sign. The branch road leads to **Sheep Creek Spring** (4.4 miles), where water of only fair quality may be obtained.
- 26.3 Road branches to right (north). A Geological Survey sign here states that this road leads to Zabriskie and Tecopa, but the road is now impassable for automobiles. To reach these points it is necessary to go northwest in south Death Valley to Confidence mill and thence northeast and east. (See p. 197.)
- 28.3 Road forks. Geological Survey sign. Road on right leads to Saratoga Springs, Death Valley, Owl Holes, and Leach Spring. Road straight ahead (west) leads to Cave Springs, Barstow, and Daggett. Take right-hand road.
- 29.6 Crossroads. Geological Survey sign. Road straight ahead leads to Owl Holes, Leach Spring, Death Valley, Shoshone, and Zabriskie. Road on right (north) leads to **Saratoga Springs** (2 miles), where water of poor quality but drinkable can be obtained. From the spring the

traveler should return to this crossroads, as a road leading directly west from it across the Amargosa bottoms is soft and treacherous. A road leading north from the spring is impassable for automobiles because of heavy sand. Road on left (south) leads to Cave Spring, Denning Spring, Barstow, and Daggett. (See mile 42.7 of log on p. 201.) Continue straight ahead.

- 32.2 Old road comes in on right (east) across Amargosa bottom. This road is soft and one should not attempt to cross it with an automobile.
- 32.7 Road forks. Geological Survey sign. Road on right leads to Death Valley, and to Shoshone, Zabriskie, and Tecopa by way of Confidence mill and Bradbury Well. (See mile 76.9 of log on p. 198.) Road on left leads to Owl Holes and Leach Spring. Turn to left. After passing through the clay hills the road reaches a wash where it may become obliterated. If so, the traveler should follow up the main wash in a general westerly direction.
- 44.1 Main road turns sharply to left (southwest) at a point where the wash emerges from the edge of the mountains. Geological Survey sign. **Water of poor quality at Owl Holes** on right side of wash. Owl Head manganese mine is 1.2 miles straight ahead (northwest) up the wash. Turn to left, following edge of hills to a divide.
- 52.0 Road junction. Geological Survey sign. Road coming from left is best road from Silver Lake, by way of Two Springs and Desert King Spring. Road straight ahead leads to Leach Spring, Granite Wells, and Randsburg. The log for the road west of here is the same as that of the Silver Lake-Randsburg road. (See mile 43.2 of log on p. 176.)

RANDBURG TO OWL HOLES, SARATOGA SPRINGS, SOUTH DEATH VALLEY, AND SILVER LAKE (112 MILES).

[For log of road in opposite direction see p. 202.]

This route is used more for travel between points in south Death Valley and Silver Lake than from Randsburg. The log, however, begins at Randsburg, as a convenient starting point. **Supplies other than water are obtainable only at Randsburg or Silver Lake**, so that the traveler should carry sufficient quantities of gasoline and oil. At different points along the route he may be more than 50 miles from any place where help may be obtained, and he should be prepared to make necessary repairs or to meet other emergencies.

0.0 **Randsburg.** Follow log of the direct route between Randsburg and Silver Lake as far as mile 59.6 on pages 171-173.

59.6 Road forks. Geological Survey sign. Log is given for road on left, which leads to Owl Holes, points in south Death Valley, Saratoga Springs, and Silver Lake. Road on right is direct road to Silver Lake by way of Desert King Spring and Two Springs. The direct route is 10 miles shorter than the road by way of Saratoga Springs, and the roadbed is also much better than on the longer route, so that unless the traveler desires to reach points on the left-hand road he should take the direct route. Continue east down wash. Road may be washed out, but follow down the wash.

64.3 Road bends to left, and a short distance beyond to right, crossing a low divide.

67.7 Road bends to left.

68.3 Road bends to right (east) and leads down a large wash. Geological Survey sign. **Water of poor quality at Owl Holes**, on left side of

road, either in a large trench or, if this is filled in, at several seeps near the foot of the hillside. A road on left (northwest) leads up the wash to a manganese camp about 1 mile distant. The road down the wash is frequently obliterated by heavy rains, but in this event the traveler should pick his way. As the ground is generally very hard no difficulty should be experienced. The road goes eastward and then northeastward. The traveler should watch for a road leading east toward low clay hills between 6.5 and 7.0 miles east of Owl Holes.

- 75.3 (approximate) Turn to right out of wash and go east to low pass through clay hills. A well-worn caterpillar road leads to these hills. If the traveler does not find this road, he can continue down the wash and around the north end of the clay hills, thence turning south on a road on the west side of the Amargosa Valley.
- 79.7 Road comes in on left a short distance east of clay hills. Geological Survey sign. Continue southeast. Road to left leads to Confidence mill and other points in Death Valley, and to Zabriskie, Tecopa, and Shoshone by way of Rhodes Spring and Bradbury Well. (See mile 76.9 of log on p. 198.) Travelers following the latter road should continue southeast to Saratoga Springs (5 miles) for water, unless they have a sufficient supply, for on the Death Valley road no water is to be obtained for nearly 25 miles, and sand and heavy grades are encountered in that distance.
- 80.2 Avoid road on left. This leads across the Amargosa bottoms directly to Saratoga Springs, but it is soft and treacherous, and one should not attempt to cross it with an automobile.
- 82.8 Crossroads. Geological Survey sign. Continue straight ahead (southeast). Road on left (north) leads to **Saratoga Springs** (2 miles), where water may be obtained. The water is of poor quality, but it is used regularly by travelers without serious harm. Road on right (south) leads to Cave Springs, Barstow, and Daggett. (See mile 42.7 of log on p. 201.)
- 84.1 Road comes in on right. Geological Survey sign. This road leads to the road to Caves Springs and Barstow.
- 86.1 Avoid branch road on left. Geological Survey sign. This road formerly led to Zabriskie and Tecopa, but since the sign was erected the road has become impassable for automobiles. To reach these points it is necessary to go in south Death Valley to Confidence mill and thence northeastward and eastward (see p. 197), or to go to Silver Lake and in a roundabout way to Ripley and northward through Pahrump Valley (see p. 208).
- 88.5 Road comes in on right. Geological Survey sign. This road leads to **Sheep Creek Spring** (4.4 miles), where **water** of only fair quality may be obtained. The spring is located about half a mile back from the mouth of a large canyon.
- 99.1 Road forks. Geological Survey sign. Follow road on right (east of south) across west side of "dry lake" flat. In wet weather it may be necessary to keep to right of the clay flat. Branch on left leads to **Riggs** station (5.5 miles), where **water** may be obtained at section house.
- 101.5 Cross east-west road on clay flat.
- 105.6 Avoid branch road on right. A short distance before this the road crosses to east side of wash.

- 109.5 Old road comes in on left.
- 110.8 Cross to east side of railroad and turn to right (south) along it. A road also continues south on the west side of track.
- 112.4 **Silver Lake.** Railroad crossing 0.1 mile south of station. **Water,** meals, and sleeping accommodations for a limited number. General supplies. From Silver Lake roads lead east to Old Sandy Mill and Goodsprings (see p. 205) and to Valley Wells, Nipton, and Cima (see p. 209); west and southwest to Barstow and Daggett (see p. 194); and south to Baker and Soda stations (see below).

SILVER LAKE TO BAKER AND SODA STATIONS (18 MILES).

A road leads south from Silver Lake along the Tonopah & Tidewater Railroad as far as Soda station. From the latter place a road formerly led on south to Ludlow, but it is impassable for automobiles and is so seldom used by wagons that it is probably nearly obliterated. No supplies are obtainable at either Baker or Soda. The log is given in only one direction.

- 0.0 **Silver Lake.** Railroad crossing 0.1 mile south of station. Go west to old railroad grade at edge of clay flat.
- 0.2 Turn to right (east of south) on clay flat, following along old railroad grade.
- 5.5 Turn to left and cross railroad. The last mile of road before this is rough.
- 5.6 Turn to right (south), leaving the railroad a short distance beyond.
- 8.1 Turn to right (approximately west), crossing arroyo, and continue northwest to station at Baker. At mile 8.1 a road on left goes east. A branch of this road leads northeast to Halloran Spring and another branch southeast to the Whitney mine and Marl Spring. Both of these, especially the latter, are reported to be practically impassable because of deep sand.
- 8.5. **Baker station.** Water is usually obtainable from a storage tank maintained by railroad. Water of very poor quality may possibly be obtained at well (**Williams Well**) at house a short distance west of railroad. Cross to west side of track and continue south on west side of clay flat.
- 13.9 Avoid branch road on right (southwest). Continue south, and some distance beyond follow edge of clay flat close to foot of mountain.
- 17.8 **Soda station.** **Water of poor quality** at spring on east side of low limestone hill on east side of track. Several flowing wells are located on the south side of this hill. The water from these wells is practically as bad as that from the spring. At one time a religious colony formed a settlement at this place, but in December, 1919, the place was deserted. An old road leads from Soda station south to **Rasor** (4 miles), **Crucero** (8 miles), and **Ludlow** (29 miles), but it is reported to be impassable for automobiles and is practically never used, even by wagons. **Water** may be obtained at each of these places.

SILVER LAKE-GOODSPRINGS.

SILVER LAKE, CALIF., TO GOODSPRINGS, NEV. (57 MILES).

[For log of road in opposite direction see p. 207.]

This route is used by travelers from Los Angeles and Barstow to Goodsprings, Mesquite and Pahrump valleys, and other points in Nevada. It is also used

to reach Tecopa, Zabriskie, and other stations on the Tonopah & Tidewater Railroad, by way of the Pahrump Valley. It is longer than the alternative route to Tecopa and Zabriskie by way of Death Valley (see p. 196), but supplies can be obtained at Goodsprings, and the traveler is not so far away from settlements if his machine breaks down or he needs help.

- 0.0 **Silver Lake.** Railroad crossing at south end of town. Geological Survey sign. Go northeast up alluvial slope.
- 4.1 Branch road on left (northeast) leads to talc prospects.
- 8.7 Road forks. Geological Survey sign. Road on right (south of east) leads to **Hytens Well**, 1.5 miles, Halloran Spring, Valley Wells, Cima, and Nipton. (See pp. 209, 212.) Follow road to left (north of east) for Francis Spring, Old Sandy Mill (Ripley), and Goodsprings. Turn to left.
- 10.0 Branch road comes in on right (south) from Hytens Well and Valley Wells road.
- 13.3 Old road branches to left (west) to a well near head of Riggs Wash (1.5 miles), where water can be obtained. Geological Survey sign.
- 19.6 **Francis Spring.** On left side of road 200 feet southwest from a cattle trough. Geological Survey sign. The spring is covered, and the quality of the water is good.
- 22.4 Old road branches to left (northwest).
- 23.6 Cross an old road.
- 24.9 Branch road on left (north) leads to a mine in Shadow Mountain.
- 29.3 Cross an arroyo in which are growing willows and catsclaw.
- 30.4 Road comes in on right (south). An old road continues to left.
- 36.0 Summit of divide; road makes S curve to right and then left down steep grade into canyon.
- 41.2 Cross an old road. Main road leads northeast across Mesquite Valley, for much of the way over a badly rutted clay flat.
- 44.8 Cross a road leading northwest and southeast.
- 45.9 Road comes in on left (west). Geological Survey sign. This road leads to Pahrump Valley and thence to Tecopa and Zabriskie. (See p. 208.)
- 46.2 **Well** 150 yards southeast of old **Sandy mill**. Good water obtainable. From here the road leads eastward up the alluvial slope, avoiding roads branching southward to the abandoned town of **Platina**, a short distance south of the mill. Water may be obtained from a dug well at the center of the town. Numerous well-worn roads branch in different directions, but the main road is plain. Water is also obtainable at a ranch house a short distance south and west of Platina, on the site of the old town of Ripley.
- 46.9 Branch road on right leads southeast.
- 51.2 Branch road comes in on right (south). Main road turns to left (north-east) up a canyon.
- 53.9 Cross a divide; descend steep grade immediately beyond.
- 56.2 Road forks. Road on left (north) leads to Goodsprings. Road on right (east) leads to Jean.
- 57.5 **Goodsprings.** Water, gasoline, general supplies, hotel, and garage. From Goodsprings roads lead south to Jean and Roach, Nev., Nipton, Ivanpah, and the National Old Trails road at Goffs, Calif. (see p. 235), and northwest to Las Vegas, Nev.

GOODSPRINGS, NEV., TO SILVER LAKE, CALIF. (57 MILES).

[For log of road in opposite direction see p. 205.]

This route is much used by persons going from Goodsprings and Las Vegas, Nev., and neighboring points, to Los Angeles, by way of Barstow and San Bernardino. It is also possible to go from Goodsprings south to the National Old Trails road at Goffs or Fenner and thence west to Barstow. This route is about 65 miles longer than the road through Silver Lake, but it lies not far from railroads for most of the distance, where help can be obtained if necessary, and it also passes through several towns where supplies can be obtained. On the shorter route Silver Lake is the only place where supplies other than water can be procured in a distance of 140 miles.

- 0.0 **Goodsprings.** Go west on main street of town, turning south after crossing railroad track.
- 1.3 Turn to west up a canyon, joining a road on left (east). Road ascends a steep grade just east of divide.
- 3.6 Cross divide and descend into canyon.
- 6.3 Avoid branch road on left (south) and turn to right (west) down alluvial slope.
- 10.6 Road comes in on left (east of south). Avoid road to abandoned town of Platina and go to old **Sandy mill**. **Water** at well with windmill a short distance east of the mill. Water is also obtainable at a dug well in the center of **Platina** and at a ranch on the site of the old town of **Ripley**, a short distance farther south. From the mill a road leads southwest across Mesquite Valley.
- 11.6 Road forks. Geological Survey sign. Continue on left-hand road (southwest). Road on right leads to Pahrump, and to Tecopa and Zabriskie by way of Pahrump Valley. (See p. 208.)
- 12.7 Cross northwest-southeast road.
- 16.3 Cross an old road. Main road continues southwest, ascending an alluvial slope into a canyon.
- 21.5 Summit of divide. Road continues south and later southwest.
- 27.1 Avoid branch road on left (south).
- 28.2 Cross an arroyo in which are growing willows and cat's-claw.
- 32.6 Road comes in on right (north) from mine in Shadow Mountain.
- 33.9 Cross an old road.
- 35.1 Old road comes in on right (northwest).
- 37.7 **Francis Spring** (on right). Geological Survey sign. The spring is about 200 feet southwest up the wash from a cattle trough and is covered with a wooden top. The water is classed as good for domestic use. From Francis Spring the road continues in a general southwest-erly direction across a divide.
- 39.3 Road bends to right (southwest). Avoid old wagon tracks leading to left.
- 40.0 Old road on right (west) leads to a **well** near head of Riggs wash (1.5 miles). Geological Survey sign. The well at this place is in the form of a tunnel, from which water is piped to a trough. From mile 40.0 continue southwest, descending into canyon.
- 47.5 Road forks. Continue southwest on right-hand road. Road to left (south) leads to **Hytens Well** (1 mile) and to Valley Wells. (See p. 209.)

48.8 Road comes in on left (south of east) from Hytens' Well, Valley Wells, Nipton, and Cima. (See p. 209.) Geological Survey sign. Continue west.

53.4 Branch road comes in on right (northeast) from tale prospect.

57.5 **Silver Lake.** Railroad crossing 0.1 mile south of station. **Water**, gasoline, meals, and sleeping accommodations for a limited number, and general supplies. From Silver Lake roads lead west to Barstow and Daggett (see p. 194) and to Leach Spring and Randsburg (see p. 174); north to Saratoga Springs, Owl Holes, and points in south Death Valley (see p. 202); and south to Baker and Soda stations (see p. 205).

SILVER LAKE TO TECOPA BY WAY OF PAHRUMP VALLEY.

As stated elsewhere, the direct roads from Barstow to Zabriskie and Tecopa have become impassable for automobiles, and to reach these points it is necessary to go either north through south Death Valley to Confidence mill and thence east (see p. 196), or to follow the more roundabout route from Silver Lake to old Sandy mill in Mesquite Valley, thence northwest to Pahrump, and back southwest to Tecopa. The latter route was not traversed by the writer, but the following brief description, based on the topographic map and on information from other sources, is inserted.

From Silver Lake go northeast, following the log of the road to Goodsprings (see p. 205) as far as mile 45.9, a short distance west of the old Sandy mill. If the traveler needs supplies he should continue east to Goodsprings (11.5 miles), and return to this point. **Water** may be obtained at a well on the east side of the old mill. Inquire as to the route from persons who may still be living at Platina or at near-by ranches, as Platina was practically abandoned in January, 1918. From the road forks just west of the old Sandy mill the traveler should go west on the right-hand road for about 1.5 miles and then turn northwest on a road which leads to Pahrump Valley. In the next several miles a number of branch roads are passed, but no data are available in regard to them. So far as can be learned the road leads northwest, a little to the west of the center of the valley, for about 25 miles, to the northeastern part of T. 21 N., R. 9 E. (see map, Pl. XII), where a road leads almost due south to the west of a low mountain, across a low divide. Other roads leading westward toward Tecopa from Mesquite and Pahrump valleys are shown on the map, but it is understood that these are not used, and they are probably not passable in some parts.

From the divide mentioned above the road leads west of south. About 4 miles from the summit a road comes in from the northeast and 2 miles farther is another road crossing from east to west. This road leads to Tecopa by way of **Resting Springs**, but because of a heavy grade leading up to the divide of the Nopah Range, about $1\frac{1}{2}$ miles west of the crossroads, it is said to be impassable for westbound automobiles, although machines coming in the opposite direction have no difficulty. To reach Tecopa it is therefore necessary to continue south-westward. **Water** may be obtainable in an emergency at Tule Springs, on the left side of the road about 5 miles beyond the branch to Resting Springs, and about 1 mile farther south the road joins one from the east and turns west, descending along Willow Creek. About 2.5 miles west of the junction south of Tule Springs the traveler should turn north, and about 1.2 miles farther on turn west to **Tecopa**. He may continue down **Willow Creek**, along which **water** can be obtained at several points, but the road that lies about 1 mile north of the creek is reported to be in better condition. The distance from Silver Lake

to Tecopa by the road leading through Pahrump Valley is said to be about 95 miles. Water can be obtained at the Tecopa railroad section house or from springs a short distance north of the station.

SILVER LAKE-NIPTON-CIMA.

SILVER LAKE TO NIPTON (63 MILES).

[For log of road in opposite direction see p. 210.]

This road is used by travelers to mines near Valley Wells and to Nipton and Cima. For travelers from Los Angeles it is 70 miles shorter to Valley Wells and 30 miles shorter to Cima than the route following the National Old Trails road to Fenner and thence going northwest to Cima and Valley Wells (see p. 229), and it is 50 miles shorter to Nipton than by way of the National Old Trails road to Goffs and thence north through Ivanpah. It has, however, the drawback that it leads across the open desert, avoiding all supply points except Silver Lake.

- 0.0 **Silver Lake.** Railroad crossing at south end of town. Geological Survey sign. Go northeast up alluvial slope.
- 4.1 Branch road on left (northeast) leads to talc prospects.
- 8.7 Road forks. Geological Survey sign. Road on left (north of east) leads to Francis Spring, Old Sandy Mill, and Goodsprings, and to Tecopa and Zabriskie by way of Pahrump Valley. (See p. 205.) Follow road to right (south of east) for Valley Wells, Cima, and Nipton. Take right-hand road.
- 9.2 Branch road leads to right (southeast). This road leads to a mill about 2 miles distant, near which three wells are said to be located.
- 10.0 Road comes in on left (north) from Goodsprings road, and just beyond a branch road on right (southeast) leads to **Hytens Well**, 0.2 mile. Water is obtainable from an inclined shaft, in which the depth to water is 125 feet. The shaft was equipped with a windlass and bucket in 1917.
- 10.1 Road comes in on right from Hytens Well.
- 11.8 Old road branches to left (northeast).
- 14.6 **Halloran Spring**, 100 feet east of road, near a water trough. Water is of good quality. Road leads south around a hill on the left.
- 14.7 Old road branches to right (southwest) down wash. Geological Survey sign. Main road immediately beyond turns to left (east).
- 14.9 Faint road branches to right (south of east). Main road continues slightly north of east parallel to a rock cliff on left hand.
- 16.3 Faint road branches to right (southeast).
- 19.1 Branch road comes in on right (southwest).
- 21.5 Old road branches to left (southeast). This is impassable for automobiles.
- 28.5 Old corral at **Valley Wells** west of smelter. Geological Survey sign. **Water** of only fair quality at well on left side of road on east side of wash. Go east up hill on north side of smelter. Just beyond the buildings of the smelting company the road forks. Caterpillar road to right leads to Cima. Caterpillar road to left leads to Nipton. Mileage is given for Nipton road. (See p. 212 for continuation of log to Cima.)
- 29.4 Branch road comes in on right (south from Cima).
- 31.8 Road forks. Caterpillar road straight ahead (east) leads to Copper World and other mines. Main road turns to right (southeast).
- 33.0 Camp of Mohawk mine (on left).

- 38.1 Road comes in on right (south) from **Mescal Spring** (see p. 211) and Cima.
- 38.6 **Mexican Well** on left (north) side of road. The water is very hard but can be used for drinking without bad effects.
- 39.3 **Roseberry Spring** on left, just west of narrow pass. **This spring is not dependable.**
- 41.5 Road forks. Geological Survey sign. Road on left (northwest) leads to Roach, Jean, and Goodsprings. Road on right (east) leads to Nipton. Take right-hand road. Water obtainable at **Wheaton Spring**, half a mile southwest of the road on the hillside.
- 43.3 Old road branches to right (southeast).
- 46.1 Crossroads. Geological Survey sign. Road on left (north) leads to Roach, Jean, and Goodsprings. Road on right (south) leads to Cima, Ivanpah, Barnwell, and Goffs. Continue straight ahead (east).
- 46.8 Crossroads. Road on left (north) leads to Roach, Jean, and Goodsprings. (See mile 46.4 of log on p. 234.) Road on right (south) leads to Cima, Ivanpah, Barnwell, and Goffs. Continue straight ahead (east).
- 48.5 Geological Survey sign. **Murphy Well** 100 yards to right. Good water is obtainable at the well only when cattle are being fed in the valley, as someone then lives at the well and water is pumped into a storage tank. A road branches to the right (south) past the well to Ivanpah, Barnwell, and Goffs. (See mile 28.8 of log on p. 236.)
- 52.7 **Nipton**, railroad station. **Water**, gasoline, food supplies, and sleeping accommodations for a limited number. From Nipton a road leads east to Searchlight, Nev. Water can probably be obtained on this road at Crescent wells.

NIPTON TO SILVER LAKE (53 MILES).

[For log of road in opposite direction see p. 209.]

This route is used principally for local travel between the points mentioned, but also to some extent by persons going from the mines near Valley Wells to Barstow, San Bernardino, and Los Angeles. Travelers going to the latter points will probably find it best to go from Nipton south to Goffs by way of Murphy Well, Ivanpah, and Barnwell, and thence west along the National Old Trails road. The distance from Nipton by way of Goffs is about 50 miles greater than by way of Silver Lake, but on the former route the roads are better for the greater part of the distance, and several supply points are passed.

- 0.0 **Nipton**. Go west across south end of Ivanpah Valley.
- 4.2 Geological Survey sign. **Murphy Well** 100 yards to left. Good water is obtainable here only when cattle are being fed in the valley, as a man then lives at the well and pumps water to a storage tank. A road leads south past the well to Ivanpah, Barnwell, Lanfair, and Goffs. (See mile 28.8 of log on p. 236.)
- 5.9 Crossroads. Continue straight ahead (west). Road on left (south) leads to Cima, Ivanpah, Barnwell, and Goffs. Road on right (north) leads to Roach, Jean, and Goodsprings. (See mile 46.4 of log on p. 234.)
- 6.6 Crossroads. Geological Survey sign. Continue straight ahead (west) up alluvial slope. Road on left (south) leads to Cima, Ivanpah, Barnwell, and Goffs. Road on right (north) leads to Roach, Jean, and Goodsprings.
- 9.4 Old road comes in on left (southeast).

- 11.2 Road comes in on right (northwest) in wash. Geological Survey sign. Continue west. Road on right is from Roach, Jean, and Goodsprings. Water may be obtained at **Wheaton Spring**, half a mile southwest of this road junction, where a green spot may be visible on hillside. The water is piped from a tunnel to a trough. No road leads to the spring.
- 13.4 **Roseberry Spring** on right, just west of narrow pass. **This spring is not dependable.**
- 14.1 **Mexican Well** on right of road. Water is of fair quality.
- 14.6 Branch road to left (south) leads to **Mescal Spring** (see p. 212) and Cima. Mescal Spring is located about seven-tenths of a mile south and two-tenths of a mile west of this point. Continue west, avoiding branch roads leading north from main road, which continues west up the wash.
- 19.1 Avoid old road on left. Main road bends to right (northwest) around point of long east-west hill.
- 19.7 Camp of Mohawk mine on right.
- 20.5 Avoid branch road on right (around point of hill) to Copper World and other mines.
- 20.9 Turn to left (south of west) on caterpillar road, which comes in on right (from east) from Copper World mine.
- 23.3 Branch road on left (south) leads to Cima. (See p. 212.) Continue west.
- 24.1 Pass Valley Wells copper smelter. A road comes in here on east from Cima. Continue west, descend hill, and turn slightly to left.
- 24.2 Corral at **Valley Wells**. Geological Survey sign. **Water** of only fair quality obtainable from dug well about 500 feet north of Geological Survey sign on east side of wash. Continue southwest past ranch house.
- 31.2 Old road comes in on left (southeast). This is impassable for automobiles.
- 33.6 Avoid branch road on left (southwest).
- 36.4 Faint road comes in on left (southeast).
- 37.8 Faint road comes in on left (southeast). Shortly beyond main road bends sharply to right (north) across wash.
- 38.0 Faint road branches to left (southwest) down wash. Geological Survey sign. Main road bends to right of hill.
- 38.1 **Halloran Spring**, 100 feet east of road. **Water** is of good quality. Continue north and later northwest.
- 40.9 Old road comes in on right (from northeast). A short distance beyond the road divides, but the two branches unite again.
- 42.6 Branch road on left leads to **Hytens Well**, about two-tenths of a mile from the road. (See p. 209.)
- 42.7 Avoid branch road on right (north). Continue west. A road comes in here from Hytens Well.
- 43.5 Road comes in on left (southeast).
- 44.0 Road comes in on right (north of east). Geological Survey sign. Continue west. The road on right leads to Francis Spring, old Sandy mill, Goodsprings, and Pahrump Valley. (See mile 8.7 of log on p. 206.)
- 48.6 Road comes in on right (northeast) from talc prospects.
- 52.7 **Silver Lake**. Railroad crossing one-tenth of a mile south of station. **Water**, gasoline, general supplies, meals, and sleeping accommodations for a limited number. (See p. 208 for roads leading from Silver Lake.)

SILVER LAKE TO CIMA (48 MILES).

[For log of road in opposite direction see below.]

The log for this road as far as Valley Wells is the same as for the Silver Lake-Nipton road.

- 0.0 Silver Lake. Follow log of Silver Lake-Nipton road to mile 28.6 on page 209.
- 28.6 Valley Wells, just east of smelter. Road forks. Road to left leads to Nipton. Caterpillar road to right leads to Cima. Take right-hand road.
- 29.4 Turn to right (south) on caterpillar road. Geological Survey sign. Old road continues east.
- 39.9 Old road comes in on right (northwest).
- 42.4 Road comes in on left (north) from Mescal Spring and Mexican Well.
- 43.4 **Kessler Spring.** Water of good quality at wells in wash on left side of road.
- 43.8 Branch road on left (southeast) leads to Ivanpah. At about mile 48.0 the road to Cima leads through a gate.
- 48.5 **Cima** railroad station. Water, oil, gasoline, and food supplies; sleeping accommodations for a limited number available. From Cima roads lead northeast to Ivanpah and Nipton (see p. 232), southeast to Lanfair and the National Old Trails road at Fenner (see pp. 230, 238), and southwest to Kelso (see p. 231). An old road, probably impassable for automobiles beyond Marl Spring, leads west and northwest to Baker and Silver Lake. (See p. 231.)

CIMA TO SILVER LAKE (48 MILES).

[For log of road in opposite direction see above.]

This route is used by travelers going from Cima to Valley Wells and Silver Lake. Some persons going from Cima to Barstow and Los Angeles also follow it, as it is about 30 miles shorter than it would be to take the road to the National Old Trails road at Fenner (see p. 230) and thence west along the National Old Trails road to Barstow. The latter route, however, passes several supply points, and except for the first 40 miles, to Fenner, lies close to the railroad. On the former route Silver Lake is the only supply point in a distance of 130 miles, and the road leads across the desert for most of the distance, many miles from any place where help can be obtained in case of accident.

- 0.0 **Cima** railroad station. Go west of north through the Gibson ranch (directly north of the station).
- 4.7 Road comes in on right (southeast) from Ivanpah.
- 5.0 **Kessler Spring.** Water of good quality at wells in wash on right side of road.
- 6.0 Avoid branch road on right (north) to Mescal Spring and Mexican Spring. Geological Survey sign. Main road bends slightly to left.
- 8.5 Old road branches to left (northwest). This is probably impassable for automobiles.
- 19.0 Turn to left (west) on caterpillar road to copper smelter. Geological Survey sign. Road straight ahead (north) leads to Copper World and other mines.

19.9 **Valley Wells** smelter. Road comes in on right (from north of east) from Nipton. From this point the log of the road is the same as that for the Nipton-Silver Lake Road. Set speedometer to 24.1 and continue west, following that log. (See p. 211.) Water of only fair quality may be obtained at well in valley about 100 feet west of the smelter.

DAGGETT TO BARSTOW-BALLARAT ROAD (13 MILES).

A road leads northwest from Daggett, joining the main road from Barstow to Ballarat 13 miles north of Barstow. This road also connects with the road from Barstow to Paradise Springs and Silver Lake. The log is given as far as the Ballarat road. No description is given of the road in the opposite direction.

- 0.0 **Daggett** railroad station. Go northwest and cross bridge over Mohave River.
- 0.9 Road forks. County sign. Continue straight ahead (north). Road to right (northeast) leads to Silver Lake, by way of Yermo, Coyote Well, and Langford Well and to Harvard. (See p. 214.)
- 1.4 Road forks. County sign. Turn to left across old railroad grade and then right along it. If desired, the traveler may continue north on right side of old grade. Log is given for both roads.

Left-hand road.

- 1.4 Turn to left across old grade and then right (north) along it, later turning to northwest.
- 2.5 Avoid branch road on left.
- 4.2 Avoid branch road on left. County sign.
- 4.6 Cross east-west road.
- 5.1 Cross east-west road.
- 6.8 Road comes in on right (south-east). This is the optional road.

Right-hand road.

- 1.4 Continue north on east side of old railroad grade. Road forks 200 feet north of signpost. Follow either branch, preferably the left.
- 3.8 Cross east-west road.
- 4.2 Turn to left (northwest) near old wells; road southeast leads to Yermo. No means of obtaining water at these wells. Roads to north lead to Calico.
- 6.2 Old road comes in on right.
- 6.9 Junction with direct road from Daggett. Set speedometer to 6.8.

- 8.9 Road forks. County sign. Road on right leads to Paradise Springs and road from Barstow to Silver Lake, joining it at mile 10.6. (See mile 12.0 of log on p. 192.) The traveler following this branch should avoid a branch road to right at mile 10.1. The road on left leads to Crutts post office, Copper City, Granite Wells, Ballarat, and other points, and log is given for it.
- 10.0 Crossroads. Continue straight ahead (west of north). Road on right is main road from Barstow to Paradise Springs, Garlic Springs, Silver Lake, Goodsprings, and points in south Death Valley. (See mile 10.9 of log on p. 192.) Road on left leads to Barstow. (See mile 71.3 of log on p. 195.)
- 13.5 Junction with main road from Barstow to Ballarat. Geological Survey sign. From this point follow log on page 182 from mile 11.3.

DAGGETT-SILVER LAKE-DEATH VALLEY.**DAGGETT TO SILVER LAKE (77 MILES) AND DEATH VALLEY.**

[For log of road in opposite direction see p. 215.]

This road is sometimes used by travelers going from Daggett to Silver Lake and points in Death Valley. It joins the road from Barstow to these points 1.4 miles east of Garlic Spring. (See pp. 191-193.) The road from Barstow is preferred by many travelers because of a short sandy stretch on the road from Daggett, north of Coyote Lake. Except for this sandy stretch the Daggett road is probably as good as the Barstow road. The mileage is given only as far as the junction with the Barstow road east of Garlic Spring. The distance to Silver Lake by this route is 77.1 miles.

- 0.0 **Daggett** railroad station. Go northwest and cross bridge over Mohave River.
- 0.9 Road forks. County signpost. Left-hand road (north) leads to Calico, Crutts post office, Copper City, etc. (See p. 213.) The Barstow-Silver Lake route may be reached by this road. Road to right (north-east) leads to Yermo, Harvard, Coyote Well, and Garlic Spring. Take right-hand road.
- 1.1 Road forks. Two roads going northeast separate but unite farther on, both leading to Yermo. Take either of these. Branch road to left (north) leads to Calico.
- 1.5 Branch road comes in on right (south).
- 2.5 Two optional roads mentioned at mile 1.1 unite.
- 3.3 Road turns to left along Los Angeles & Salt Lake Railway and follows it to Yermo.
- 4.8 West end of Yermo, road comes in on left (west) from Calico, Crutts post office, etc. Turn to right through the town.
- 5.0 **Yermo**. **Water**, meals, gasoline, oil, and general supplies. Go east along north side of railroad.
- 7.5 Road forks. Road on left leads to borax mines at Borate. Follow road straight ahead along railroad for a short distance.
- 7.8 Road forks. Road straight ahead parallel to railroad leads to Harvard and Fields. This road formerly led along the railroad for many miles, but it has been washed out in Caves Canyon along Mohave River, and no road exists between Fields and Kelso. Water at Harvard and at several other stations on the railroad. (See map and list of watering places, pp. 248-269.) Road on left (northeast) leads to Coyote Well, Bitter Spring, Langford Well, Garlic Spring, Silver Lake, and south Death Valley. Log is given for left-hand road.
- 8.1 Old branch road on right leads east.
- 9.2 Road branches to right to near-by ranch, and just beyond a road comes in from the ranch.
- 9.8 Branch road on right (northeast) leads to Alvord Mountain and Bitter Spring. The road is reported to be impassable through the mountain. Bitter Spring is now reached by the left-hand road. (See p. 216.) Continue on left-hand road.
- 13.6 Road comes in on left (southwest).
- 16.4 **Coyote Well** (on left side of road). Well equipped with bucket and windlass. **Water** is of very poor quality and should not be used for drinking unless absolutely necessary. Just beyond road turns north-

east across "dry lake" flat. In wet seasons it may be necessary to go eastward around edge of lake flat.

- 17.4 Wagon tracks go to left (northwest) across lake flat, passing flowing wells at northwest end of lake. (See p. 253.) Main road goes north-east across clay flat.
- 20.6 North side of "dry lake" flat. Ascend a long slope which is sandy and difficult to travel for a short stretch just beyond the lake flat.
- 29.3 Road on right (northeast) leads to Bitter Spring. (See p. 216.) Geological Survey sign.
- 30.6 **Langford Well.** Well is equipped with windlass and bucket. **Water is of good quality.** From Langford Well an old road on left (north) leads to Garlic Spring, 2 miles (see p. 193); tracks on right (east) lead across "dry lake" to a windmill and thence to Bitter Springs.
- 31.6 A road crosses from northwest to southeast.
- 32.2 Junction with Barstow-Silver Lake road, 1.4 miles east of Garlic Spring. Geological Survey sign. Road straight ahead (north) up narrow wash leads to Silver Lake, Goodsprings, Cave Springs, Saratoga Springs, Zabriskie, Tecopa, and south Death Valley; road on left (southwest) leads to Garlic Spring, Paradise Springs, and Barstow. (See mile 44.9 of log on p. 195.) See mile 37.3 (p. 193) for log of the route north of this point.

SILVER LAKE TO YERMO (78 MILES) AND DAGGETT (77 MILES).

[For log of road in opposite direction see p. 214.]

This road is the same as the road from Silver Lake to Barstow for the first 45 miles, the roads to the two places separating about 1.5 miles east of Garlic Spring. It is used only by those who wish to go direct to Daggett, as the distance to Barstow by way of Daggett is about 4 miles longer than the direct road to Barstow. The distance from Silver Lake to Daggett is about 5 miles shorter than that from Silver Lake to Barstow. On the Daggett road supplies may be obtained at Yermo, 5 miles north of Daggett. The road is good except for a short sandy stretch north of Coyote "Lake," and as this is on a down grade the traveler should experience little difficulty.

- 0.0 **Silver Lake.** Railroad crossing 0.1 mile south of station. Follow log of Silver Lake-Barstow road to mile 44.9. (See p. 194.)
- 44.9 Road forks. Geological Survey sign. Follow road on left (southwest). Road on right (west) leads to Garlic Spring, Paradise Springs, and Barstow.
- 45.5 Road crosses from northwest to southeast.
- 46.5 **Langford Well** on left side of road. Well equipped with windlass and bucket. **Water of good quality.** Continue west of south, ascending alluvial slope. At Langford Well a road comes in on the right (northwest) from Garlic Spring (2 miles) and tracks lead to the left (southeast) across a "dry lake" to a windmill and thence to Bitter Springs. (See p. 216.)
- 47.8 Road comes in on left (northeast) from Bitter Springs. (See p. 216.) Geological Survey sign. Continues southwest, crossing broad divide.
- 56.5 North side of Coyote "Dry Lake." Follow road across clay flat. In wet weather it may be necessary to go around the edge of the flat.
- 59.7 Wagon tracks come in from right (northwest) on clay flat.
- 60.7 **Coyote Well** on right side of road. Well equipped with windlass and bucket. **Water of very poor quality** and should not be drunk unless

absolutely necessary. Road bends to left (south) and crosses low divide some distance beyond.

- 63.6 Avoid branch road on right (southwest).
 66.3 Old road comes in on left (northeast). County sign. This road formerly led to Alvord Mountain and thence to Bitter Springs, but it is now probably impassable for more than a few miles. (See below.)
 67.6 Avoid branch road on left (south) to ranch house. Main road bends to right (southwest). Road comes in on left from ranch at mile 67.9.
 69.0 Old road comes in on left (east).
 69.5 Turn southwest along Salt Lake & Los Angeles Railroad. A road comes in on left. (northeast) along railroad from Harvard and Fields. (See p. 214.)
 71.1 **Yermo.** Water, meals, gasoline, and general supplies. Go west through the town on road north of railroad shops.
 72.3 Road forks, west end of Yermo. County sign. Follow road on left (southwest) toward the railroad. Road on right (west) leads to Calico, Crutts post office, Granite Wells, etc.
 73.8 Road bends to right (southwest) away from railroad.
 74.6 Road forks. Follow either branch, as they unite at mile 76.0.
 75.6 Avoid branch road on left (south).
 76.0 The two optional roads mentioned at mile 74.6 unite. Turn to left (south). A road also comes in here on right (north) from Calico. (See p. 213.)
 76.2 Road comes in on right from across old railroad grade. County sign. Continue south, crossing bridge over Mohave River.
 77.1 **Daggett.** Meals and general supplies obtainable. From Daggett the National Old Trails road leads eastward to Ludlow and Needles and the Eastern States (see mile 92.6 of log on p. 121) and west to Barstow, Victorville, San Bernardino, and Los Angeles (see mile 172.3 of log on p. 127). At Barstow the road connects with roads leading to Randsburg, Mojave, Bakersfield, and San Francisco.

DAGGETT TO BITTER SPRING (43 MILES) AND SILVER LAKE.

This road, if it were in good shape, would be the shortest route from Barstow and Daggett to Silver Lake. It is, however, reported to be very sandy over certain stretches, and for this reason is practically never used except by prospectors. The road originally followed the old Salt Lake road, which was one of the earliest routes of travel through this part of the desert, leading from San Bernardino to Salt Lake City. In recent years, however, part of the original road, almost to Bitter Springs, has been abandoned because of wash-outs in the Alvord Mountains. Only a part of the route was traveled by the writer, so that a complete log can not be given. The log is given in only one direction, and travelers going in the opposite direction should note certain warnings.

- 0.0 **Daggett.** Follow the log of road from Daggett to Silver Lake by way of Coyote and Langford Wells as far as mile 29.3 on pages 214-215.
 29.3 Road forks. Geological Survey sign. Follow branch to right (northeast). Left-hand branch leads to **Langford Well** (1.3 miles), where water may be obtained, Garlic Spring, Silver Lake, and points in south Death Valley. It is the usual route to Silver Lake. Unless the traveler has an abundant supply of water he should fill his containers at Langford Well, as the water of Bitter Springs is of poor quality.

- 30.5 Well and windmill at south edge of clay flat. In February, 1918, the windmill was out of order, and there was no way of obtaining water unless one had a rope and bucket. From here continue a little north of east toward a low pass at east edge of clay flat.
- 31.8 Turn to right (southeast) through low, broad pass, a short distance beyond turning back to left (east and later northeast).
- 38.4 Well-marked road comes in on right (southwest). This road comes from Daggett by way of Mule Canyon in the Alvord Mountains, but it is reported to be washed out and impassable in the canyon. Although at this place it is in good condition, it should be avoided by anyone going toward Daggett. Turn to left (northeast) on this road.
- 40.6 Turn to right (northeast) around lava hill.
- 41.8 (approximate) Road enters a sandy wash, which it follows, bending southeast. This wash is reported to be very sandy. The writer traveled it immediately after a rain and encountered no difficulty. One can probably descend it without trouble but may become stuck going in the opposite direction.
- 42.8 **Bitter Spring** in pass between low hills. The spring is located about 100 yards southeast of a large mesquite tree and old shack on the south side of a low hill. Water is carried by a short pipe line to a trough. **The water is of poor quality** but can be used for drinking in an emergency.

From Bitter Spring an old road leads southeast to Cronise Lake, which is believed to be sandy and otherwise difficult to travel. The road to Silver Lake was not traveled beyond this point, and only brief notes can be given. From the spring it leads first north, along the bank on the east side of the wash down which the road comes from Daggett, and a short distance beyond bends northeast. A divide is crossed about 8 miles northeast of the spring, and the road then descends to Red Pass, probably 11 or 12 miles from the spring. An old road comes from the northwest just before the pass is entered. A well is said to have been dug in Red Pass, but so far as could be learned this has been filled in. From Red Pass the road leads northeast, joining the main road from Barstow and Daggett to Silver Lake, 5 miles west of the last-mentioned place. (See mile 77.0 of log on p. 193.) This road junction is marked by a Geological Survey sign. The road to Silver Lake leads east from this point. The distance from Bitter Spring to Silver Lake is probably about 25 miles. The distance from Daggett is probably at least 10 miles less than the route regularly used, but in addition to the sand near Bitter Spring the road is said to be sandy and otherwise in bad condition between the spring and the main road 5 miles west of Silver Lake.

DAGGETT TO ORD MOUNTAIN AND STODDARD WELL (29 MILES).

This road leads to mines in Ord Mountain, 14 miles south of Daggett, and thence west to Stoddard Well. It should not be confused with the more direct road to Stoddard Well and Victorville described on page 149. In January, 1918, the mines in Ord Mountain were closed down and the road was practically not used except by prospectors. The log is given in one direction only.

- 0.0 **Daggett.** South side of railroad at west end of town. Go south on road that leads up alluvial slope and enters a wash several miles south of town. Continue up the wash.
- 7.4 Avoid old tracks to right.
- 9.1 Road forks. Geological Survey sign. Follow right-hand road up wash. Road to left is said to fork some distance east of this point, one branch

going approximately east to Kane Spring and the other leading south-east to Willis Well and ranch, about 8 miles from the fork at mile 9.1. It was not traveled by the writer.

- 10.6 Cross low divide and turn to left.
- 12.9 Crossroads. Geological Survey sign. Road straight ahead (south) leads to a mine camp (closed in January, 1918) and to **Sweetwater Spring** (1.1 miles). The spring is located 1,000 feet southeast of the camp and about 100 feet above it in a side canyon. It can be found by following a pipe line leading to it from a water tank near the camp buildings. Water may be stored in the tank. An analysis of water taken from the tank showed it to be very good. The road to left (east), at mile 12.9, leads to **Aztec Spring**, near a mill about 1 mile distant, and to **Willis Well**, about 6 miles southeast of the crossroads. Nothing is known of either of these two watering places. It is reported that this road also leads to Old Woman Spring, but the road is probably not in very good condition. It should be noted that Le Conte Spring, which is shown on old maps as being near this road on the southeast side of Ord Mountain, is reported not to exist. The road to right (west) at mile 12.9 leads to Stoddard Well, and log is given for it.
- 13.6 Road forks. Geological Survey sign. Follow right branch (leading south of west). The faint tracks leading approximately south originally led to Box S ranch, but this road is now impassable.
- 16.3 Faint tracks come in on left.
- 16.6 Cross low divide.
- 17.4 Turn to northwest along east side of low granite mountains.
- 20.4 Turn approximately to west, going between mountain and small knob on right.
- 28.9 Junction with main road from Daggett and Barstow to Stoddard Well and Victorville. Geological Survey sign. (See mile 17.1 of log on p. 149 and mile 19.6 of log on p. 148.) **Stoddard Well** is 0.4 mile southwest of this junction.

NEWBERRY (WATER POST OFFICE) TO OLD CAMP CADY (10 MILES).

This road is used entirely for local travel and leads to a number of homesteads north of Newberry (Water post office, formerly called Wagner post office).

- 0.0 **Newberry station**, south side of railroad. Go west along railroad to crossing.
- 0.2 Turn north across railroad, then to right (east) back nearly to the station, and then north of east.
- 0.8 Road forks. Follow branch on right (northeast).
- 1.4 Turn north on section line.
- 2.3 (approximate) Avoid branch roads on right (northeast and east). Road comes in on left (southwest).
- 3.4 **Schoolhouse** on right. **Water** at pump.
- 4.4 Crossroads. Turn east. Several **ranches** near here where **water** may be obtained.
- 5.7 Turn to left (northeast). Road straight ahead (east) leads to ranches.
- 10.2 Ranch house at old **Camp Cady**. **Water obtainable from springs along river bank**. From Camp Cady a road leads southwest along the south side of the river for several miles. Between 2 and 2.5 miles southwest of the house mentioned at mile 10.2 a very sandy road leads north across the river channel. From this point the road continues along the river terrace, and a short distance beyond it forks, the left

branch leading southwest to the road on the section line which was followed north from Newberry as far as mile 4.4. The branch along the river leads to ranches. On the north side of the river an old road leads both northeast and southwest along the river bottom. A road also leads up onto the upland north of the river and thence north to Harvard station.

LAVIC TO IMPERIAL AND SUNSHINE MINES.

A road leads south from the National Old Trails road at Lavic (mile 129.2 of log on p. 122 and mile 135.7 of log on p. 126) to mines in the mountains about 8 miles southwest of that station. From the station the road leads approximately south to a clay flat at the southeast end of the lava flow from the Pisgah Crater. On this clay flat, 3.7 miles from Lavic, the road forks. The right branch bends westward. A short distance beyond it also forks. A poor road on the right leads northwest along the southwest edge of the lava flow, joining the National Old Trails road about 15 miles west of Lavic. This road is practically abandoned. The other branch at this place leads to the west edge of the clay flat and thence southwest up a very steep grade across a lava flow to the Imperial Lode mine near the summit of the mountains southwest of Lavic. In February, 1918, a company was working this mine. Water was hauled to the mine from Lavic.

The left branch, 3.7 miles from Lavic, leads west of south across the clay flat. A short distance beyond the south edge of the flat, 7 miles south of Lavic, there is a mill and several bunkhouses. From this place the road continues southwest up an alluvial slope, farther on turning west and northwest to the Sunshine mine, near the summit on the south side of the mountains, a total distance by road from Lavic of about 15 miles. At the mill 7 miles from Lavic there is a **dug well** about 125 feet deep. In November, 1917, this was covered with a tightly closed pump house which contained an electric pump. At that time workmen were at the Sunshine mine, and water was kept in a storage tank at the well and could be obtained by travelers, but in February, 1918, it was reported that the mine was shut down, and it is probable that **this is not a reliable watering place**. The quality of the water is poor.

Certain old maps show a road continuing south and southwest from the road to the Sunshine mine to Means Well and other points on the south side of the mountains, but so far as could be ascertained this road no longer exists. Nothing could be learned of the existence of a spring which was marked Peacock Spring on old maps of this road.

LUDLOW (STAGG POST OFFICE) TO CRUCERO AND CRONISE VALLEY.

From Ludlow a road leads northward, approximately parallel to the Tonopah & Tidewater Railroad. This road was formerly much used for wagon traffic to Soda Lake, Silver Lake, and points in Death Valley, but since the building of the railroad it has fallen into disuse. It is practically impassable for automobiles from a point a short distance beyond Broadwell station (10 miles north of Ludlow) to Soda station, north of which a road leads to Silver Lake. (See p. 205.) The road is used occasionally by wagons. It is said that automobiles have gone as far as Crucero by running along the railroad grade. This is not to be recommended. On this old road water is obtainable at Mesquite Spring (see below), about 20 miles north of Ludlow; at Razor station, 29 miles north

of Ludlow; at Soda station, 33 miles north of Ludlow; and at Crucero, 25 miles north of Ludlow, as long as telegraph operators are kept there. Broadwell is only a train stop, and no water is obtainable there.

Mesquite Spring is on the west side of the Tonopah & Tidewater Railroad tracks, between mileposts 22 and 23. It lies at the north foot of low granite hills, close to the track, and is marked by mesquite bushes. There are two pits about 100 feet apart. The water is very bad.

There are several ranches near Crucero, and water can be obtained at several wells, including a well with a windmill at the Ingalls ranch, about half a mile south of the station, and another well with a pump at the Proctor ranch, about three-quarters of a mile northwest of the station. The water at these ranches is good. The Proctor ranch was the only one occupied in December, 1918, and it is uncertain whether the wells at the ranches will be kept in such a condition that water can be easily obtained.

The territory for many miles around Crucero is very sandy, and automobiles are useless. Wagon trails lead to ranches east of Crucero, west to King and Baxter, and northwest to Cronise Valley and Bitter Spring. These are used infrequently, and must be broken anew after each windstorm. The road from Crucero to Cronise Valley goes northwest from the station for about a mile, past the Proctor ranch, thence west for about $1\frac{1}{2}$ miles, and thence in a general northwesterly direction, striking for a pass between low hills at the northeast end of the prominent Cave Mountain. On this road, in December, 1920, water was obtainable at a well on the Baber ranch, in the SW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 33, T. 11 N., R. 7 E., about half a mile northwest of the main channel of Mohave River, which is distinguished from the surrounding country only by a growth of desert willows. The water is very bad. Water of good quality was obtainable at the same time in a well equipped with a windmill at the Markt ranch, at the southeast end of a large granite hill that lies just east of the northeast tip of Cave Mountain. Wells are located at several other ranches, but it is not so easy to obtain water from them. From the Markt ranch a road leads north and northwest across East Cronise "Dry Lake" and around the north end of the Cronise Mountains to West Cronise "Dry Lake" and thence northwest to Bitter Spring. It is said that persons with automobiles have used this road to reach mines near Baxter, going first from Daggett northeast to Bitter Spring, southeast to Cronise Valley, and thence to Baxter. The road is very sandy in places, however, and it is not recommended. It is reported that springs exist on the northwest side of West Cronise "Dry Lake."

LUDLOW (STAGG POST OFFICE) TO STEDMAN.

A road leads south from Ludlow to the mines of the Pacific Mines Corporation at Stedman, a distance of about 8 miles. The road leads up a wash, following closely the railroad which runs to Stedman, crossing the track several times. About 5 miles south of Ludlow the road, after crossing to the east side of the railroad, leaves the latter and goes across the upper part of a large alluvial slope. A branch road on the right, toward the railroad, as well as one on the left (east) down the slope, should be avoided, the main road continuing south for some distance and then bending southwest. In November, 1917, about 80 men were employed at the mines. All water used was hauled from Newberry Springs in tank cars. Recent township plats of T. 5 N., R. 8 W., show a road, which probably starts at Stedman, leading to a well, marked Morgan Well, about 8 miles nearly due south of Stedman. Nothing is known about this road or the well

**BAGDAD TO ORANGE BLOSSOM MINE, PROVIDENCE MOUNTAINS,
AND KELSO.**

A road leads east of north from Bagdad to the Orange Blossom mine, about 10 miles distant. This road was not traversed by the writer, and the following description is based on more or less indefinite information obtained from various sources. Considerable money was spent on the mine and a mill, and the road was originally in good condition. The mine had not been in operation for some time in November, 1917, and nothing was known of the condition of the road at that time. Water for the mill was piped from a spring about 4 miles northeast of the mine. This is probably **Willow Spring**. A road is said to lead from Willow Spring northeast to Providence Mountain and to connect with a road that leads west from Fenner and with a road that is reported to lead north from Kelso. **Cove, Van Winkle, and Cottonwood springs** are located on the map (Pl. XII) within a few miles of the south end of the Providence Mountains, according to information given by prospectors, but these locations, as well as the existence of a road from Willow Spring to these other places, are very uncertain. At best, the roads northeast of Willow Spring, except that from Fenner to the Hidden Hill mine (see p. 228 and Pl. XII), are used very little and probably are in bad condition.

AMBOY TO DALE.

A road leads south from Amboy across a pass in the Sheep Hole Mountains to Dale. This road was at one time much traveled, as there was a large mining camp at Dale and all supplies were hauled in from the railroad at Amboy. A stagecoach made regular trips between the two places. The mines have been practically closed down for several years and the road is very seldom used. It was not traversed by the writer and no log is given for it, but the following notes are inserted.

The road leads from Amboy a little east of south across Bristol "Dry Lake," then south through a broad pass in the mountains, and then southwestward to a well at the west edge of Dale "Dry Lake," about 30 miles from Amboy. This is the only water between Amboy and Dale. Heavy sand is encountered south of Bristol "Dry Lake," and the last few miles on the west side of Dale "Dry Lake" is said to be even more sandy. High-powered automobiles have difficulty in going through this sand, and many of them cross it on deflated tires, which offer greater traction. About 2.5 miles south of the well mentioned above the road joins a road that leads westward to **Twenty-nine Palms**, 14 miles, where water can be obtained, and to Banning, on the Southern Pacific Railroad. This road is described on pages 243-246. Another well is said to be located about 6 miles east of the road junction. Because of the heavy sand encountered on the road between Amboy and Dale the latter place is more easily reached from Banning, by way of a road leading northeast through Morongo Pass and east past **Twenty-nine Palms**.

CADIZ-DANBY-PARKER.

Travelers may reach Parker, Ariz., by three routes. One road branches from the National Old Trails road 3.5 miles north of Cadiz and leads to that station, whence it turns southeast along the Parker-Phoenix branch of the Atchison, Topeka & Santa Fe Railway. This road for the first 18 miles beyond Cadiz is very rough and in places sandy. To avoid this some travelers continue on the National Old Trails road to Danby and then turn south, coming into the Cadiz-Parker road at Kilbeck, although this makes the journey 9 miles longer. Most

travelers, however, continue on the transcontinental road to Needles and then turn south to Parker. This route is 37 miles longer than the Cadiz-Parker road but is much better, and the tourist will travel more comfortably and probably make better time by taking this route. It is also preferable, because on the Cadiz-Parker road supplies are usually not obtainable until Vidal is reached, although sometimes they may be obtained at Rice (formerly called Blythe Junction). Hotel accommodations for a few persons are available at Vidal and meals can be obtained at Rice. The route by way of Rice and Vidal is near the railroad for the entire distance, whereas the route by way of Needles covers a stretch of 60 miles through the open desert along which there is very little water. The latter road, however, is usually in good condition and is traveled almost daily. Each of the three roads is popularly known as the Parker Cut-off. The road to Parker from Cadiz and Danby is used by persons going to Vidal, Rice, and Blythe, and to Yuma and the Imperial Valley. A log is given for the stretch from the National Old Trails road, north of Cadiz, as far as Kilbeck, and the full log is given for the route from Dandy to Kilbeck and thence to Parker.

NATIONAL OLD TRAILS ROAD TO KILBECK BY WAY OF CADIZ.

[For log of road in opposite direction see p. 224.]

- 0.0 From National Old Trails road, 3.5 miles north of Cadiz, go south-eastward. (See mile 180.5 of log on p. 123 or mile 84.4 of log on p. 125.)
- 2.8 Road forks. The right-hand road goes directly to section house at Cadiz, where water can be obtained. In 1918 supplies were not obtainable at Cadiz. The left-hand road goes to the railroad crossing 0.1 mile east of section house. Either road may be taken, but the distance given is for the one on the left.
- 3.6 Cross old road going east and west parallel to main line of Atchison, Topeka & Santa Fe Railway.
- 3.7 Cross railroad and turn to right (west). Road on left goes to Siam station.
- 4.4 Cross branch line of railroad, turn sharply to left (southeast), and follow this track (Parker branch of Atchison, Topeka & Santa Fe Railway).
- 9.6 McCoy siding.
- 15.6 Archer station. Water at railroad pump station.
- 21.7 Kilbeck. At east end of siding a road comes in on left from across track, marked by Geological Survey sign. This is the road from Danby. Continue southeast, following log of road from Danby, given below, from mile 18.9.

DANBY, CALIF., TO PARKER, ARIZ., BY WAY OF KILBECK AND RICE (90 MILES).

[For log of road in opposite direction see p. 224.]

- 0.0 Station at Danby. (See mile 192.1 of log on p. 123 and mile 72.8 of log on p. 125.) Go southwest, turning south in a short distance.
- 0.1 A road leads east to mine prospects in the Old Woman Mountains. (See p. 227.)
- 6.9 Branch road leads to left (east). Geological Survey sign. This road goes to the Yellow Metal Mining Co. camp in Carbonate Gulch, on the west side of the Old Woman Mountains (about 11 miles). Water for the camp is obtained by a pipe line from a spring. Mr. Leroy Palmer, of the United States General Land Office, states that the spring may be found by going up Carbonate Gulch to the first large branch

gulch entering from the north in the vicinity of mining prospects. A road leads up this gulch for about half a mile to a pipe line that extends from the Yellow Metal Camp to the spring, and the spring can be found by following the pipe line from this point. In the spring of 1919 the camp was deserted and the siphon connecting the pipe line with the spring was disconnected.

- 9.1 Branch road on left leads to prospects in the mountains. Geological Survey sign. It is reported that this road leads to a **spring** in a canyon in the mountains.
- 11.5 Branch road on left leads to prospects in the mountains. Geological Survey sign.
- 18.3 Branch road comes in on left from prospects in the mountains. Geological Survey sign. Main road bends slightly to right. An old road that continues straight ahead should be avoided.
- 18.8 Branch road comes in on left from prospects in the mountains.
- 19.2 Cross railroad at east end of Kilbeck siding and turn to left on road parallel to track. This is the road from Cadiz to Parker. (See p. 222.) Geological Survey sign.
- 20.1 An old road branches to right (south) to mine prospects.
- 23.5 Fishel siding.
- 28.8 **Milligan**. Geological Survey sign at crossing west of section houses. **Water** at section houses. The main road leads southeast, leaving the railroad. A branch road leads northeast to mine prospects on the east side of Old Woman Mountains. (See p. 227.)
- 30.0 Road leads on to "dry lake" flat (Danby Lake).
- 36.8 On "dry lake" flat road goes to left (north) to **Ward** station (1.3 miles), where **good water** may be obtained at pumping plant. Geological Survey sign.
- 37.8 East edge of "dry lake" flat.
- 41.0 **Sablon** siding. **Water** usually obtainable from cistern.
- 48.2 Arica siding.
- 51.6 Cross branch railroad, west end of Rice.
- 51.8 **Rice**, formerly called **Blythe Junction**. **Water**, meals, and sometimes gasoline and a small amount of general supplies. Leaving Rice, turn to right (south) away from railroad.
- 52.0 Turn at a right angle to left. Geological Survey and Automobile Club signs. Road straight ahead leads to Blythe (40.6 miles), Yuma (138 miles), and points in the Imperial Valley.²⁵ On the road to Blythe water can be obtained at Brown Well, 6.4 miles from Rice, and sometimes at Gyp Well, 14.5 miles.
- 61.2 **Grommet** station. **Water** at section houses.
- 73.2 **Vidal**. **Water**, gasoline, meals, groceries, and hotel accommodations. A road leads north from Vidal joining the Parker-Needles road 11 miles distant. The distance to Needles is 55 miles. (See p. 242.) A road leads south to mines in the Riverside Mountains. Leaving Vidal, go east close to railroad.
- 73.8 Turn to right (southeast) away from railroad.
- 76.2 Crossroads. Turn approximately at a right angle to left (northeast).
- 79.8 **Calzona**. **Water** may perhaps be obtained at a ranch house south of railroad, but the town has been abandoned, and it is not a reliable watering place.

²⁵ For log of this road see Brown, J. S., Routes to desert watering places in the Salton Sea region, Calif.: U. S. Geol. Survey Water-Supply Paper 490-A, p. 65, 1920.

- 80.1 Turn at a right angle to left (north) and cross railroad.
- 80.3 Road forks. Right-hand road leads to Parker; left-hand road (little used) leads to Needles.
- 83.5 Junction with Needles-Parker road. Geological Survey and Automobile Club signs. Road on left (northwest) leads to Needles, 54 miles. (See mile 7.0 of log on p. 242.) Road on right (southeast) leads to Parker Ferry.
- 87.7 Road enters wash. Tracks may lead to right, down a wash. Main road turns to left (northeast) across the wash, and farther on goes under railroad.
- 90.2 Branch road comes in on right along river. Road leads north close to river, under railroad bridge.
- 90.4 **Ferry landing** at Colorado River, opposite Parker. The location of the ferry is changed from time to time, according to river conditions, and the road leading to the ferry in the last mile is accordingly changed, but the ferry company erects temporary signs wherever necessary, so that one should have little difficulty in reaching the landing. The same condition exists on the Arizona side of the river. Parker is reached about half a mile beyond the river. **Water** and gasoline are obtainable at the ferry, and general supplies and hotel and garage accommodations are available at Parker. In 1918 the ferry charge for each automobile was \$2.

The road from Parker to Phoenix and other points in southwestern Arizona is described in United States Geological Survey Water-Supply Paper 490-C, entitled "Routes to desert watering places in the lower Gila region, Ariz.," by Clyde P. Ross (in preparation).

PARKER, ARIZ. (FERRY), TO DANBY (90 MILES) AND CADIZ, CALIF. (93 MILES).

[For log of road in opposite direction see p. 222.]

Many persons going from Phoenix, Ariz., to Los Angeles, Calif., follow the northern route to Parker, crossing Colorado River by ferry. (See p. 115 for note on alternate routes between Phoenix and Los Angeles.) From Parker there are three possible routes to the National Old Trails road. (See p. 221 for note on these three routes.) Two of these routes to Cadiz and Danby are identical, except for the last 20 miles. These are described in the following log. The direct road to Cadiz leads along the Parker branch of the Atchison, Topeka & Santa Fe Railway for practically the entire distance, and water can be obtained at short intervals, but supplies are obtainable only at Vidal and sometimes at Rice (formerly called Blythe Junction). The road as far as Rice is used by persons going from Needles and points in Arizona to mines and ranches near Blythe. The road from Parker to Cadiz is in fair condition, but many chuck holes and detours around ditches along the Atchison, Topeka & Santa Fe tracks require slow running.

The road between Parker and the ferry across Colorado River, a distance of less than a mile, was not traveled by the writer, and no log is given for it. The log begins on the California side of the river. The ferry operates practically every day in the year. In 1918 a fee of \$2 was charged for ferrying automobiles.

- 0.0 **Ferry landing**, west side of Colorado River opposite Parker. The road for the first mile is changed from time to time, but temporary signs direct the traveler. In November, 1917, the ferry landed north of the railroad bridge, and the road led south under the bridge, turning

- to the right (west) a short distance beyond and passing through a culvert under the railroad, thence leading in a southwesterly direction.
- 0.2 Avoid branch road on left along river bottom.
- 2.7 Road bends to right (west) and ascends a short grade. Wagon tracks come in on left, but these may be washed out.
- 7.0 Road forks. Geological Survey and Automobile Club signs. Follow road on left (south). Right-hand road leads to Needles, 54 miles. (See p. 242.)
- 10.1 Road comes in on right (north) from Needles. Continue south.
- 10.3 Cross to south side of railroad and a short distance beyond turn to right (west) along railroad.
- 10.6 Calzona. **Water** may possibly be obtained at a ranch house a short distance south of the station, but as the town has been abandoned this is not a reliable watering place. From Calzona the road gradually bends southwest, away from the railroad.
- 14.2 Crossroads. Automobile Club sign. Turn approximately at a right angle to right (northwest).
- 16.6 Turn to left (west) along railroad.
- 17.2 **Vidal**. **Water**, gasoline, groceries, meals, and sleeping accommodations for a limited number available. Continue west along south side of railroad some distance beyond the town, turning to left (south) away from railroad but later coming back to it. At Vidal a road goes north to Needles. (See p. 242.)
- 29.2 **Grommet** station. **Water** at section houses.
- 38.4 North-south road. Geological Survey and Automobile Club signs. Turn to right (north). Road to left (south) leads to Blythe, Yuma, and points in the Imperial Valley.²⁰ On this road water is obtainable at Brown Well (6.4 miles from Rice) and sometimes at Gyp Well (14.5 miles).
- 38.6 **Rice**, formerly called **Blythe Junction**. **Water**, meals, and sometimes gasoline and other supplies obtainable. Leaving Rice, go west along railroad.
- 38.8 Cross branch railroad. Continue west along railroad.
- 42.2 Pass Arica siding.
- 49.4 **Sablon** siding. **Water** usually obtainable from cistern on south side of track. West of this the road turns away from the railroad.
- 52.6 East edge of Danby "dry lake" flat. Continue northwest across clay flat.
- 53.6 On clay flat branch road leads north to **Ward** station (1.3 miles), where **good water** may be obtained at pumping plant. Geological Survey sign. Continue northwest across clay flat.
- 60.4 Northwest edge of clay flat.
- 61.6 **Milligan** station. **Water** at section houses. Continue west on south side of railroad. A short distance west of the station a road leads north across the tracks and thence northeast to mine prospects on the east side of Old Woman Mountains. (See p. 227.) This branch is marked by a Geological Survey sign.
- 66.9 Pass Fishel siding.
- 70.3 Old road comes in on left (south).
- 71.2 Road forks at east end of Kilbeck siding. Geological Survey sign. One road continues along south side of railroad to Cadiz. Another road

²⁰ For log of this road, see Brown, J. S., op. cit., p. 65.

turns to right (north) across railroad, leading to Danby. The stretch between this point and Cadiz on the left-hand road is rough, and sandy in places, and many travelers, to avoid it, turn north to Danby, where they strike the National Old Trails road and continue west along it. The distance is 10 miles greater by the latter road, but the roadbed is good, and the traveler will probably save time by following it. The log is given for both roads. The road to Cadiz was not traveled between Kilbeck and McCoy, and the mileage for that stretch is only approximate.

Left-hand road (to Cadiz).

- 77.3 Archer station. **Water** at pumping plant.
- 83.3 McCoy siding.
- 88.5 Near junction of Parker branch of Atchison, Topeka & Santa Fe Railway with main line, turn sharply to right across tracks and go east along south side of main-line tracks. Automobile Club sign. Avoid road leading west on south side of tracks.
- 89.2 Turn to left and cross to north side of main line. Automobile Club sign. Avoid old road leading east to Siam station on south side of track.
- 89.3 Cross old road leading east and west. If **water** is needed, it may be obtained at section house or at Cadiz station, a short distance west, but otherwise the traveler should continue in a northerly direction to the National Old Trails road.
- 90.1 Road comes in on left from station.
- 90.5 Avoid old road on right (north-east).
- 92.9 Junction with National Old Trails road. Automobile Club sign. The main road leads west to Amboy (12.4 miles), Ludlow, Barstow, San Bernardino, and Los Angeles (see mile 84.4 of log on p. 125), and east to Danby, Fenner, Goffs, and Needles (see mile 180.5 of log on p. 123).

Right-hand road (to Danby).

- 71.6 Avoid branch road on right (northeast) to mine prospects in the Old Woman Mountains.
- 72.1 Road forks. Geological Survey sign. Main road bends to left; avoid branch on right toward mountains.
- 78.9 Branch road comes in on right (southeast). Geological Survey sign.
- 81.3 Branch road comes in on right. Geological Survey sign. This road is said to lead to a spring in the Old Woman Mountains.
- 83.5 Branch road comes in on right from Yellow Metal Mining Camp. Geological Survey sign. (See p. 222 for note in regard to spring near this camp.)
- 90.4 Danby. **Water, gasoline, and food supplies.** From Danby a road connects with the National Old Trails road 0.5 mile north of the town, which leads west to Cadiz, Amboy, Ludlow, Barstow, San Bernardino, and Los Angeles (see mile 72.8 of log on p. 125), and east to Fenner, Goffs, and Needles (see mile 192.1 of log on p. 218).

MILLIGAN TO WILHELM CAMP AND SUNFLOWER SPRING.

This road is used principally by prospectors. It connects with a road from Danby to Sunflower Spring, but several miles of the road is impassable because of sand and other difficulties. The log is given in only one direction.

- 0.0 **Milligan.** Branch road leading north from Cadiz-Parker road at Geological Survey sign, a short distance west of section house. Cross to north side of railroad and go east along it past house, then turn northeast and later north. Two roads lead east of north, approximately 0.2 mile apart. The westerly one of these should be avoided, as it is badly washed out in places.
- 11.5 Road forks. Geological Survey sign. Follow road on left. The road straight ahead leads to the same place but is not in as good condition.
- 11.8 Turn to right on long straight road. The parallel road from Milligan comes in here on left. In going south to Milligan the road nearest the mountain south of this point should be avoided, although at this point it seems to be in good condition.
- 16.8 Turn to left toward mouth of a canyon, where buildings may be seen.
- 17.5 **Wilhelm Camp.** Water from pipe line at trough in corral. The water is piped from a natural tank about 3 miles south and a little west of the camp. The supply is reported to be good ordinarily, but in November, 1917, only a small flow was coming through the pipe. From the Wilhelm Camp a road leads east. This road forks within a short distance; the right branch leads southeast to the parallel road which was left at mile 11.5 and the left branch bends northeast and joins the same road farther north. The left branch continues north and northwest, leading to **Sunflower Spring**, about 5 miles west of north of the Wilhelm Camp. Sunflower Spring is said to be a reliable watering place. Mr. Leroy Palmer, of the United States General Land Office, states that although incrustation about the spring indicates its alkalinity the spring is frequently used as a camping place, and probably the water has been drunk without very harmful effects. It can not be reached by automobile. From it a road also leads north and northwest to Danby, passing Weavers Well about 12 miles east of Danby. (See below.) Automobiles can travel from Danby only to Weavers Well, but wagons can travel the stretch from Weavers Well to Sunflower Spring and the Wilhelm Camp.

DANBY TO BONANZA SPRING AND CLIPPER MOUNTAIN.

From Danby a road leads northwest, crossing the National Old Trails road 0.5 mile north of that town. About 2 miles from Danby the road forks. The left branch leads to **Bonanza Spring**, about 6 miles from Danby. A pipe line carries the water to the railroad tank at Danby, but it is reported that one can obtain water at the spring. Bonanza Spring should not be confused with a well located near the Bonanza King mine about 20 miles northwest of Fenner. The right branch leads north to the Tom Reed and Clipper mines in the Clipper Mountains. At both mines water stands in the shafts, and each is said to be equipped with a windlass, so that the water can be drawn. The supply from the Clipper mine is reported to be good, but that from the Tom Reed shaft is said to be poor.

DANBY TO WEAVERS WELL AND SUNFLOWER SPRING.

From Danby a road leads almost due east to mine prospects at the north end of Old Woman Mountains. Water is said to be obtainable at a number of

places at the north end of the mountains. **Weavers Well** is located about 12 miles east of Danby. In November, 1917, the well was reported to be equipped with a good pump. About 1.5 miles before it is reached a road branches to the right to the Golden Fleece mine. Water for use at this mine is piped from **Honeymoon Spring**, which is about 1 mile south of Weavers Well. The spring is described by Leroy Palmer, of the United States General Land Office, as being in the NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 3, T. 6 N., R. 17 E. San Bernardino meridian. The water is derived from a tunnel in granite. The flow is small, but the water is good.

From Weavers Well a road continues southeast to **Sunflower Spring**, about 25 miles, and thence to the Wilhelm Camp, on the east side of the Old Woman Mountains, and south to Milligan. (See p. 227.) The road, however, is impassable for automobiles from Weavers Well almost to the Wilhelm Camp, although it can be traveled by wagons.

FENNER TO HIDDEN HILL MINE AND KELSO.

From Fenner a road leads almost due west to the Hidden Hill mine at the south end of the Providence Mountains, a distance of about 25 miles. There is no water at the mine, but **Van Winkle Spring** is said to be located about 4 miles southwest of it, being reached by a road. A road is reported to continue around the south end of the mountains and north down a long valley to Kelso. The road to Kelso is probably difficult to travel because of sand, and it may be washed out in places. **Cove Springs** and **Cottonwood Springs** are reported to be reached by branch roads. A spring reported as Dripping Spring may be the same as Cove Spring, and one shown on certain maps as Arrowweed Spring may be the same as Cottonwood Spring. On the other hand, a spring called Cottonwood Spring is shown on a guide map published recently as being nearly 7 or 8 miles west of the one shown on Plate XII. Nothing was learned of the existence of this spring. Water is reported in shafts at Gannon's camp, about 4 miles north of the Hidden Hill mine, but it is not known whether it is easily obtainable.

FENNER TO BONANZA KING MINE AND DOMINGO'S RANCH (21 MILES).

Until recent years this was an important road, as it leads to the Bonanza King mine, in the Providence Mountains, northwest of Fenner. When this mine was producing ore a large number of men were employed, and all supplies were hauled to the camp over the road herein described. The mine was idle when visited in November, 1917, although there were rumors that it might be reopened. The road was being used occasionally by several prospectors who were working near the mine.

- 0.0 **Fenner.** At west end of railroad station. Go northwest on a road marked by a Geological Survey sign.
- 3.8 **Road forks.** Geological Survey sign. Road on right (north) leads to Moore's ranch and Cima. (See p. 229.) Follow road straight ahead (northwest), which leads to Bonanza King mine and Domingo's ranch.
- 15.7 **Road passes between low hills.** Geological Survey sign directs to **Colton Well**. This well is located several hundred feet north of the sign, and may be reached by following up a wash which leads to the right at the sign, shortly bending to the left, or by continuing northwest on the road for about 0.2 mile, where a windmill may be seen projecting a

few feet above the surface, about 500 feet to the right of the road. The water is of fair quality. If the windmill is not working a short rope and bucket may be needed to obtain it. From the Geological Survey sign continue northwest.

19.2 Avoid branch road on right.

20.5 Road forks. Geological Survey sign. Road on left leads northwest up a steep slope to Bonanza King mine (mile 22.0). Unless some one is living at the mine there is no means of obtaining water here, but usually a supply is kept in a large storage tank for a watchman. Road on right leads to Domingo ranch. Log is continued for right-hand road. An old trail leads southwest along the foot of Providence Mountains, but it is impassable for automobiles.

21.3 Domingo ranch. Water is obtainable here, being piped to the ranch house from Beecher Spring, about 0.7 mile east, in a canyon on the south side of a malpais butte. The water is of good quality. From the ranch a road leads north a short distance and then west to a well formerly used to supply the Bonanza King mine. This well is located in the valley east of the mine, and is about 2 miles from the ranch. When visited there was no way to obtain water at the well, as it was covered. From here the road leads north to prospects and to Barbers Well, 1 mile north of Domingo's, behind a lava butte. It is not known whether water is easily obtainable at this well. From the Bonanza King Well a road leads south to the main road. Two or three other wells and springs are reported to furnish water along the foot of the Providence Mountains, southwest of the Bonanza King mine, but no roads lead to these and nothing definite is known about them.

FENNER-CIMA.

FENNER TO CIMA (40 MILES).

[For log of road in opposite direction see p. 230.]

This road is used by travelers from Los Angeles and points on the National Old Trails road to Cima, Kelso, Valley Wells, and near-by mines. It is also used by some travelers going to Lanfair, Barnwell, Ivanpah, Nipton, and Goodsprings, although these points may also be reached by a road leading north from Goffs, 10 miles east of Fenner.

- 0.0 Fenner. On National Old Trails road at west end of Santa Fe station. Geological Survey sign. Go northwest on long, straight road.
- 3.8 Road forks. Geological Survey sign. Road straight ahead (northwest) leads to Bonanza King mine and Domingo's ranch. (See p. 228.) Follow road to right (north) for Cima, etc.
- 18.8 Old road branches to left.
- 20.0 Old road comes in on left (south). Geological Survey sign.
- 20.7 Road forks. Geological Survey sign. Continue north on right branch. Road on left leads to Granite Well and Everet Well. Granite Well is located 2.3 miles from the main road, about 500 feet west of the point where the branch road bends south, well up on the side of granite hills. An old well is located about 200 feet west of the road and in sight from it, but a well with better water is located about 300 feet farther west in a wash that is hidden from the road. Everet Well is reported to be 0.5 mile southwest of Granite Well.
- 21.2 Crossroads. From mile 23.8 to mile 25.0 the main road leads up a sandy wash, in which heavily laden machines may become stalled. This

bad stretch may be avoided by taking the road on the right (north-east) at mile 21.2 and going a little more than 2 miles to a road that leads northwest back to the main road in Black Canyon at mile 25.1.

- 25.1 Road comes in on right (southeast).
- 26.0 Road on right leads to **Moore's ranch** (0.3 mile), where **water** of fair quality may be obtained. It returns to the main road at mile 26.6, and because of the roughness of the latter between the two points it may be preferable.
- 26.4 Crossroads. Geological Survey sign. Road straight ahead (northeast) leads to Government Holes, Lanfair, Ledge, and Barnwell. (See p. 238.) Road on right (south) leads to Moore's ranch. Turn to left (north) for Cima and Valley Wells.
- 27.4 Road comes in on right (east) from Government Holes and Lanfair. (See p. 237.) Geological Survey sign. Road continues north to Cedar Canyon and then turns west down it.
- 30.9 In Cedar Canyon. Main road turns to left around edge of wash, but old road goes down the wash, the two uniting 0.7 mile farther on.
- 32.7 Out of Canyon. Old road continues west; main road turns to right (north).
- 36.9 Road comes in on right (southeast) from Death Valley mine. Water is obtainable at mine when it is operating.
- 39.2 Cross railroad and turn to left (southwest) along track. Geological Survey sign.
- 39.5 Cima railroad station. **Water**, gasoline, meals, and sleeping accommodations for a limited number. From Cima roads lead northeast to Ivanpah, Nipton, Jean, Roach, and Goodsprings (see p. 232); northwest to Valley Wells and Silver Lake (see p. 212); and southwest to Kelso (see p. 231).

CIMA TO FENNER (40 MILES).

[For log of road in opposite direction see p. 229.]

This road is used by persons going from Cima and near-by points to the National Old Trails road at Fenner and thence east to Needles or west to Barstow, San Bernardino, and Los Angeles. The latter points are also reached by way of Valley Wells and Silver Lake. (See p. 212.) The road to these towns, by way of Fenner, is about 30 miles longer than the Silver Lake route, but it passes more supply points and, except for the first 40 miles (as far as Fenner), is traveled daily, so that help can be obtained in case of accident.

- 0.0 Cima. North side of railroad station. Go east.
- 0.3 Cross to south side of railroad. Geological Survey sign. Continue to the right (east and southeast), away from railroad.
- 2.6 Branch road on left goes to Death Valley mine. Water obtainable at the mine if it is operating. Main road bends to right (south).
- 6.8 Road descends into Cedar Canyon. An old road leads up the wash of the canyon, but a newer one crosses the wash and leads up the south side of it.
- 8.6 Old and new roads unite. A short distance beyond the road turns right (south) and ascends out of the canyon.
- 12.1 Road forks. Geological Survey sign. Follow road to right (south). Road to left (east) leads to Government Holes and Lanfair. (See p. 238.) There is a well at a house on left side of road at this point, but when visited it was badly contaminated by dead animals.
- 13.1 Crossroads. Geological Survey sign. The traveler may continue straight ahead (south) to **Moore's ranch** (0.2 mile), where **water** can be

obtained, and thence turn west, or he may turn to right (west) at this point. The road is slightly better by way of Moore's ranch. Road on left (northeast) leads to Government Holes and Lanfair.

13.5 Road comes in from Moore's ranch.

14.4 In Black Canyon, branch road leads to left (southeast). The main road continues south down the canyon, but it may be washed out in the next mile. If so, this stretch may be avoided by turning left on the branch at mile 14.4 and following it southeast for nearly 3 miles to a road that leads southwest to the main road at mile 18.7.

18.3 Crossroads. Continue south. The road from the left (northeast) is the optional road, branching at mile 14.4. To the right it leads to **Granite Well** and **Everet Well**, 2.3 miles. (See p. 229.)

18.8 Road comes in on right (northwest) from Granite and Everet wells. Geological Survey sign.

19.5 Avoid old branch road on right. Geological Survey sign. Main road bends to left (southeast).

20.7 Old road comes in on right.

35.7 Road junction. Geological Survey sign. Turn to left (southeast) on straight road to Fenner. Road on right (northwest) leads to Colton Well, Bonanza King mine, and Domingo's ranch. (See p. 228.)

39.5 **Fenner**. **Water**, gasoline, meals, and a small stock of food supplies. From Fenner the National Old Trails road leads east to Goffs and Needles (see mile 208.4 of log on p. 123) and west to Danby, Ludlow, Barstow, San Bernardino, and Los Angeles. (See mile 56.5 of log on p. 125.)

CIMA TO KELSO AND MARL SPRING.

A road leads southwest from Cima along the Los Angeles & Salt Lake Railroad to Kelso. The road lies within a few hundred feet of the railroad for the entire distance, and, as no important branches lead from it, no log is considered necessary. When traveled in October, 1917, it was in bad condition in several places, particularly where the surface run-off from the mountains east of the railroad was concentrated through culverts under the track, cutting deep arroyos across the road. It was, however, passable for automobiles. Water can be obtained at **Chase**, 4 miles from Cima, at **Elora**, 7 miles from Cima, and at **Hayden**, 15 miles from Cima. **Kelso**, 18.6 miles from Cima, is an important water station on the railroad, with a small settlement, where water, gasoline, and food supplies may be obtained. A road formerly led southwest from Kelso along the railroad, but it is very sandy and practically impassable for automobiles. There is no passable road along the railroad from Kelso as far west as **Fields**, and to reach points west of the latter place it is necessary to return to Cima and then go to Fenner and west along the National Old Trails road or to go to Valley Wells and thence to Silver Lake and southwest to Barstow and Daggett. A road is also said to lead south across the divide at the southwest end of the Providence Mountains, connecting with roads to Fenner and Amboy, but it is seldom used, and automobiles would probably have much difficulty in traveling over it.

From Cima a fair road, cut by many chuck holes, leads west to **Marl Spring**, a distance of 9.5 miles. At this place water is obtained from tunnels, but when visited the water was not very clean. The place is used for watering cattle. From Marl Spring an old road leads northwest to Silver Lake. The road is reported to be practically impassable for automobiles northwest of Marl Spring because of very heavy sand. It was not traveled by the writer.

CIMA-IVANPAH-NIPTON.**CIMA TO IVANPAH AND NIPTON (26 MILES).**

[For log of road in opposite direction see below.]

The roads between Cima, Nipton, and Ivanpah (formerly called Leastalk or South Ivanpah) are used practically only for local travel.

- 0.0 **Cima** railroad station. Go east along railroad.
- 0.3 Turn north along fence. Geological Survey sign.
- 3.5 Crossroads. Geological Survey sign. Road on right (east) leads to Ivanpah (11.5 miles); road on left (west) leads to Kessler Springs and Valley Wells. Road straight ahead (north) leads to Nipton, Roach, and Goodsprings. Log is given for road to Nipton. The road to Ivanpah leads east for about 2.5 miles and then bends slightly to the north. The traveler should avoid all branches from it toward the railroad. It reaches the railroad at Ivanpah. (See pp. 234, 236 for roads leading from Ivanpah.)
- 7.6 Bend east near old cabin and later northeast.
- 9.9 Crossroads. Turn to right (east) down long slope.
- 12.8 Crossroads. Geological Survey sign. Turn to left (northeast). Road straight ahead (east) leads to Ivanpah.
- 16.5 Junction with road from south near site of old town of Ivanpah (abandoned). Turn north.
- 19.7 Crossroads. Turn to right (east). Road straight ahead (north) leads to Roach, Jean, and Goodsprings. (See mile 46.4 of log on p. 234.) Road on left (west) leads to Valley Wells and Silver Lake. (See mile 5.9 of log on p. 210.)
- 21.4 Geological Survey sign. **Murphy Well** near house 100 yards to right. **Water** is obtainable at the well only when cattle are being fed in the valley, as someone then lives at the well and pumps water into a storage tank. A road branches south, past the well, to Ivanpah, Barnwell, Lanfair, and Goffs. (See mile 28.8 of log on p. 236.)
- 25.6 **Nipton** railroad station. **Water**, gasoline, supplies, meals, and sleeping accommodations for a limited number. From Nipton a road leads east to Searchlight. This road was not traveled, and nothing is known about it.

NIPTON TO IVANPAH AND CIMA (26 MILES).

[For log of road in opposite direction see above.]

This road is used almost entirely for local travel between Nipton and Cima and near-by points.

- 0.0 **Nipton** railroad station. Cross railroad and go west, avoiding branch roads on right.
- 4.2 **Murphy Well** on left. Geological Survey sign. (See above.) Road on left (south) leads to Ivanpah, Barnwell, and Goffs. (See mile 28.8 of log on p. 236.) Continue west.
- 5.9 Turn to left (south) for Cima. Road straight ahead leads to Valley Wells and Silver Lake. (See mile 5.9 of log on p. 210.) Road on right (north) leads to Roach, Jean, and Goodsprings. (See mile 46.4 of log on p. 234.)
- 9.1 Road forks near site of old town of Ivanpah, now abandoned. Follow road on right (southwest). Road on left (east of south) leads to **Ivanpah**.

12. 8 Crossroads. Geological Survey sign. Turn to left (west). Road straight ahead (southwest) also leads to Cima, but it is sandy and very little used. Road on left (east) leads to Ivanpah.
14. 7 Crossroads. Turn to left (southwest).
17. 0 Turn south, near old cabin, avoiding road leading west.
22. 1 Crossroads. Geological Survey sign. Continue straight ahead. Road on right (west) leads to Kessler Springs and Valley Wells. Road on left (east) leads to Ivanpah. (See p. 232.)
25. 3 Railroad. Geological Survey sign. Turn to right along track. Road straight ahead across railroad, bending to left immediately beyond, leads to Lanfair, Fenner, and Goffs. (See pp. 230, 238.)
25. 6 Cima railroad station. **Water**, supplies, meals, and sleeping accommodations for a limited number. From Cima roads lead southwest to Kelso (see p. 231), northwest to Valley Wells and Silver Lake (see p. 212), and southeast to Lanfair, Fenner, and Goffs (see pp. 230, 238).

GOFFS-BARNWELL-GOODSPRINGS.

GOFFS TO BARNWELL, CALIF. (39.4 MILES), AND GOODSPRINGS, NEV. (74 MILES).

[For log of road in opposite direction see p. 235.]

This route is used by travelers going from Los Angeles, Needles, and other points on the National Old Trails road to Lanfair, Ledge, Barnwell, Ivanpah, Nipton, Roach, Jean, and Goodsprings. It is also used by some persons going to Cima. The distances beyond the Murphy Well were obtained by scaling from the topographic map and are only approximate. In 1918 gasoline, oil, and food supplies were obtainable at Lanfair and Ivanpah. The traveler should be sure that they can still be obtained at these points or should carry sufficient quantities with him.

0. 0 Goffs post office. Go west on National Old Trails road.
0. 1 Turn to right (north). Geological Survey sign.
9. 2 Crossroads. Road on right (east) leads to the Leiser Ray mine. Road on left (west) leads to Vontrigger siding. Geological Survey sign. Just beyond this point road on right (northeast) leads to the California mine.
9. 8 Branch road on right (northwest) leads to **White's ranch** and **Vontrigger Spring**. The road as far as Vontrigger Spring is probably impassable for automobiles, but in 1917 the water from the spring was piped to White's ranch, 0.4 mile north of the road fork. The spring is about 1 mile north of the fork. The water is obtained from a tunnel. Main road continues west.
9. 9 Crossroads. Road on right (north) leads to White's ranch and Vontrigger Spring. Geological Survey sign. Continue west, and at about mile 10.7 descend into low canyon, turn to right (north), and immediately beyond cross to west side of railroad.
12. 2 Old road comes in on right (southeast) from across railroad.
12. 7 Blackburn siding. Continue north along track. Branch road on left (northwest) leads to a pipe line from **Hackberry Spring**. No road leads to the spring, but 2.2 miles from Blackburn, on the west side of low hill at the northeast foot of the mountain, the pipe line enters into a cattle trough, and water can be obtained at that point.
16. 5 Lanfair. In 1918 **water**, gasoline, oil, and food supplies were obtainable at this place. Road on left (west) leads to Government Holes and Cima. (See p. 237.) Continue north along railroad,

- 21.7 **Ledge** (Maruba post office). **Good water** at **Jacoby ranch** on east side of railroad. Continue north along railroad.
- 24.6 Purdy siding. Road on left (west) leads to mine prospects in the New York Mountains. Continue north, leaving the railroad within a short distance.
- 28.0 Branch road on left (west) leads to **Lecyr well** (0.3 mile). **Water poor** at this well.
- 28.6 Two roads come in on left (west and south) from mine prospects. Geological Survey sign.
- 29.4 **Barnwell**. **Water** at railroad station or at one of several wells. From Barnwell a branch road runs east and northeast to Searchlight. No information is available in regard to it. Continue north.
- 32.0 Branch road leads to right (north).
- 35.2 Cross railroad. Branch road comes in on north side of track.
- 36.1 Cross railroad.
- 36.3 **Ivanpah**. In 1918 **water**, gasoline, oil, and food supplies were obtainable. Water can always be had at the railroad station. From Ivanpah the road continues north to Nipton, Roach, Jean, and Goodsprings, with a branch road leading west to Cima and Kelso. Go west on south side of railroad to crossing.
- 36.4 Turn to right (north) across railroad. Immediately north of railroad a road on left (west) leads to Cima. Main road leads west of north.
- 37.4 Road forks. Geological Survey sign. Road on left (west) leads to Cima and Valley Wells. Road on right leads to Murphy Well, Nipton, Goodsprings, etc. Take right-hand road. Mileage from this point is scaled from the topographic map and is only approximate.
- 39.7 Los Angeles & Salt Lake Railroad **pumping station**. **Water** obtainable. Continue north.
- 43.0 Road comes in on right (southeast).
- 44.7 Junction with east-west road at **Murphy Well**. Geological Survey sign. Water is obtainable at the well only in case a pumper lives there and pumps water into a tank for cattle. Road on right (east) leads to Nipton. (See p. 232.) Road on left (west) leads to Valley Wells and Silver Lake. Turn west (left) on Silver Lake road for 1.7 miles or northwest on road leading to "dry lake" flat. Mileage is by way of former road.
- 46.4 Crossroads. Road straight ahead (west) leads to Valley Wells and Silver Lake (see mile 5.9 of log on p. 210). Road on left (south) leads to Cima. (See p. 232.) Road to right (north) leads to Roach, Jean, and Goodsprings. Turn to right. North of this point there are several roads which eventually lead to the same point. The traveler should follow any of the roads that lead north on the "dry lake" flat of Ivanpah Valley, going to the right (east) of a rocky point at the north end of the lake, where several tracks join.
- 57.5 (approximate) Several roads unite at northeast end of clay flat. A good road formerly led from this point northwest through State Line Pass to Mesquite Valley and thence to Pahrum, but this was washed out in 1917 and is impassable unless it has since been repaired. To reach Mesquite Valley it is necessary to continue north to Goodsprings.
- 58.0 Branch road on right (northeast) leads to railroad.

- 58.3 Branch road on right (northeast) leads to Roach, where water can be obtained at houses of section crew. North of this point several well-worn tracks lead north on a clay flat or west of it. They are confusing, but as they all unite some distance farther on any one of them can be followed.
- 62.4 Road comes in on right (southeast) from Roach.
- 63.2 Road forks. Road on right leads to Jean (6.5 miles), where water can be obtained, and to Las Vegas. This road was not traveled and no log is given for it. Road on left leads to Goodsprings. Mileage is given for left-hand road.
- 66.6 Road comes in on right (southeast).
- 68.6 Road comes in on right (east) from Jean.
- 69.0 Branch road on left (west) leads to mines.
- 72.7 Diagonal crossroads. Road on right (east) leads to Jean. Road on left (west) leads to mines in Spring Mountain and to Silver Lake and Mesquite and Pahrum valleys. Road continues straight ahead.
- 73.1 Road comes in on right (southeast) from Jean.
- 73.5 (approximate) Goodsprings. Water, gasoline, general supplies, hotel, and garage. From Goodsprings roads lead southwest to Silver Lake, Barstow, and Los Angeles (see p. 207); northwest to Pahrum Valley and Tecopa and Zabriskie; and northeast to Las Vegas.

GOODSPRINGS, NEV., TO BARNWELL AND GOFFS, CALIF. (74 MILES).

[For log of road in opposite direction see p. 233.]

This route is used by persons going from Goodsprings and near-by mining camps to Barstow, San Bernardino, and Los Angeles, by way of the National Old Trails road, which is reached at Goffs. These points may also be reached by a more direct route leading southwest to Silver Lake (see p. 207) and thence to Barstow. The latter road is about 65 miles shorter than the route by way of Goffs, but it leads across the unsettled desert, and Silver Lake is the only supply point in a distance of 140 miles. Going by way of Goffs, the traveler passes through several places where supplies may be obtained, and for practically the entire route he is only a short distance from railroad stations where help may be obtained in case of accident. The road described in this log is also used considerably for local travel, as several mining and agricultural settlements are located along it.

The first 35 miles of the log is based largely on measurements from the topographic maps and is only approximate.

- 0.0 Goodsprings. Go east to end of town and turn south.
- 0.4 Avoid branch road to Jean on left (southeast). Road to Goffs leads east of south near foot of mountains.
- 0.8 Diagonal crossroads. Continue east of south, a short distance beyond passing between low hills on left and the mountain on right.
- 3.0 Avoid roads on right to mines in the mountains.
- 4.5 Branch road comes in on right (west) from mines.
- 4.9 Avoid branch road on left (east) to Jean.
- 6.9 Avoid branch road on left (southeast) to railroad.
- 10.3 Road comes in on left (east of north) from Jean.
- 11.1 Avoid road on left (east of south) to Roach, where water can be obtained at houses of section crew. Beyond this point the road crosses a clay flat. Many tracks diverge and all are badly rutted. The trav-

- eler must pick out the best of these, watching for high centers. He should continue in a general southerly direction toward a rocky point which comes down from the mountains on the west to the southwest end of the clay flat.
- 15.2 Road comes in on left (northeast) from Roach.
- 15.5 Road comes in on left (northeast) from railroad.
- 16.0 At north end of Ivanpah "dry lake" flat several roads divide. Continue in a general southerly direction, keeping to the east side of the clay flat and avoiding roads that lead to the west toward the mountains on the right.
- 27.1 Crossroads, a short distance south of end of clay flat. Turn to left (east). Road on right (west) leads to Valley Wells and Silver Lake. (See mile 5.9 of log on p. 210.) If desired the traveler may continue south, avoiding branch roads to right and turn to left to Ivanpah.
- 28.8 Turn to right (south) on road near **Murphy Well**. Geological Survey sign. Road straight ahead (east) leads to Nipton, 4.2 miles. The traveler may have followed one of the many branches at mile 16.0 that join the east-west road nearer to Murphy Well than the crossroads at mile 27.1, and if so he should make proper allowance in mileage. **Water** is obtainable at Murphy Well only if some one is living near the well to pump water into a tank.
- 30.5 Road forks. Turn to right (south) toward pumping station (visible about 3 miles to the south).
- 33.8 Pass Los Angeles & Salt Lake Railroad **pumping station**. **Water** here.
- 36.1 Road comes in on right (northwest). Geological Survey sign. Turn to left (southeast).
- 37.1 Cross to south side of railroad and turn to left (east) along it.
- 37.2 **Ivanpah**. In 1918 **water**, gasoline, oil, and food supplies were obtainable. Go east away from Salt Lake Railroad.
- 37.4 Cross railroad.
- 38.3 Avoid branch road on left (northeast) and cross to south side of railroad.
- 41.5 Avoid branch road on right and continue southeast up canyon.
- 44.1 **Barnwell**. **Water** at railroad station or at one of several wells. From Barnwell a road leads east and northeast to Searchlight. Main road continues south on west side of railroad.
- 44.9 Road forks (three branches). Geological Survey sign. Follow road on left (south).
- 45.5 Branch road on right leads to **Lecyr Well**, 0.3 mile. **Water** is poor in this well.
- 48.9 Purdy siding. Continue south along west side of railroad.
- 51.8 **Ledge** (Maruba post office). **Water** at **Jacoby ranch** on east side of railroad. Continue south on west side of track.
- 57.0 **Lanfair**. In 1918 **water**, gasoline, and food supplies were obtainable at this place. Continue south on west side of railroad. From Lanfair a road leads west and northwest to Government Holes and Cima. (See p. 237.)
- 60.8 Blackburn siding. Continue south, passing through small canyon and crossing railroad at its lower end. From Blackburn a road leads northwest to **Hackberry Spring**. (See p. 233.)
- 62.3 (approximate) Turn to left (east) and ascend out of canyon.
- 63.1 Crossroads. Geological Survey sign. Continue east. Road on left (north) leads to **White's ranch** and **Vontrigger Spring**. (See p. 233.)

- 63.8 Crossroads. Geological Survey sign. Continue south. Road on right (west) leads to Vontrigger siding. Road on left (northeast) leads to the California mine, and a second one on left, a few feet farther south, leads to the Leiser Ray mine.
- 73.4 Junction with National Old Trails road at Goffs. Turn to left.
- 73.5 Goffs post office. General supplies and hotel accommodations. From Goffs the National Old Trails road leads east to Needles and points in Arizona (see mile 218.2 of log on p. 123) and west to Fenner, Danby, Ludlow, Barstow, San Bernardino, and Los Angeles. (See mile 46.7 of log on p. 125.)

LANFAIR-CIMA.

LANFAIR TO CIMA (26 MILES).

[For log of road in opposite direction see p. 238.]

This road is used mostly for local travel, but some persons use it in going from points along the National Old Trails road, turning north to Lanfair at Goffs.

- 0.0 Lanfair. Go west on section-line road at south end of station, avoiding all branch roads.
- 5.8 Turn north, school on left.
- 6.2 Turn to left (west).
- 6.8 Turn diagonally to right (northwest).
- 7.8 Cross east-west road. Continue northwest, turning more to the west a short distance farther on.
- 8.9 Road forks. Follow either branch. Log is given for left branch, which is shorter. A short distance beyond descend steep grade.
- 9.3 Road comes in on right. This is the optional road mentioned at mile 8.9. A faint road branches to left (south) to Rock Springs (0.3 mile). The spring is located about 100 yards up a small canyon that enters the main valley from the west. Water is usually obtainable here, but in **January, 1918, the spring was practically dry.**
- 9.4 Avoid branch road on right (north). Geological Survey sign. A short distance beyond this point the road bends to the left up a hill.
- 11.5 Go through corral at Government Holes. Water at well on south side of corral. On west side of corral road forks. Follow right branch (approximately west). Left branch (southwest) leads to Moore's ranch and thence to Fenner. (See mile 13.1 of log on p. 230.)
- 13.8 Junction with north-south road. Geological Survey sign. Turn to right (north). Road on left (south) leads to Moore's ranch and Fenner. (See mile 12.1 of log on p. 230.)
- 17.3 In Cedar Canyon. Main road turns to left around edge of wash, but old road goes down the wash, and the two unite 0.7 mile farther on.
- 19.1 Out of canyon. Old road continues west; main road turns to right (north).
- 23.3 Road comes in on right (southeast) from Death Valley mine. Water is obtainable at mine when it is operating.
- 25.6 Cross railroad and turn to left (southwest) along track. Geological Survey sign.
- 25.9 Cima railroad station. Water, gasoline, meals, and sleeping accommodations for a few persons. From Cima roads lead northeast to Ivanpah, Nipton, Jean, Roach, and Goodsprings (see p. 232), northwest to Valley Wells and Silver Lake (see p. 212), and southwest to Kelso (see p. 231).

CIMA TO LANFAIR (86 MILES).

[For log of road in opposite direction see p. 237.]

- 0.0 Cima. North side of railroad station. Go east.
- 0.3 Cross to south side of railroad. Geological Survey sign. Continue to right (east and southeast), away from railroad.
- 2.6 Branch road on left goes to Death Valley mine. Water obtainable at the mine if it is operating. Main road bends to right (south).
- 6.8 Road descends into Cedar Canyon. An old road leads up the wash of the canyon, but a newer one crosses the wash and leads up the south side of it.
- 8.6 Old and new roads unite. A short distance beyond the road turns right (south) and ascends out of the canyon.
- 12.1 Road forks. Geological Survey sign. Follow branch on left (east). Road straight ahead (south) leads to Moore's ranch and Fenner. (See mile 12.1 of log on p. 230.)
- 14.2 Go through corral at Government Holes. Water at well on south side of corral. Continue east from corral. On the west side of the corral a road from the southwest is from Moore's ranch.
- 16.3 Road comes in on left (north). A faint road on right (south) leads to Rock Springs (0.3 mile) up a short canyon on west side of valley. Water is usually obtainable here, but in January, 1918, the spring was dry.
- 16.4 Road forks. The right branch is the direct route to Lanfair, but a short distance beyond the forks a heavy grade is encountered, and if the machine can not climb it the traveler should return to mile 16.4 and follow the left branch for a short distance; then turn to the right at a second fork (avoiding a road leading north) and ascend out of the valley on an easier grade, turning south and joining the main road again at mile 16.8.
- 16.8 Road comes in on left. This is an optional road from mile 16.4.
- 17.9 Cross east-west road and continue southeast.
- 18.9 Turn to left (east).
- 19.5 Turn to right (south).
- 19.9 Turn to left (east); school on right. Continue east on section line, avoiding all branch roads.
- 25.7 Lanfair. In 1918 water, gasoline, and supplies were obtainable here. From Lanfair a road leads south to the National Old Trails road at Goffs (see mile 57.0 of log on p. 236), and north to Ledge, Barnwell, Ivanpah, Nipton, Jean, and Goodsprings (see mile 16.5 of log on p. 233).

NATIONAL OLD TRAILS ROAD TO SEARCHLIGHT AND LAS VEGAS
(ARROWHEAD TRAIL).

About halfway between Goffs and Needles on the National Old Trails road a branch leads north. (See mile 232.3 of log on p. 123, and mile 22.6 of log on p. 125.) This road leads to Searchlight and Las Vegas, Nev., and thence to Salt Lake City, Utah, and is known as the Arrowhead Trail. According to reports in February, 1918, this was not a desirable route to Salt Lake City because of rough roads at certain places, and also because it was necessary to ford Virgin River at St. Thomas, there being no bridge across it. The county, however, keeps a team at the river to pull cars across the ford. Ordinarily,

persons going from southern California to Salt Lake City will follow the Midland Trail through Mojave to Big Pine, thence passing eastward through Goldfield and Tonopah to Ely, where they meet the Lincoln Highway. In winter, however, the Midland Trail may be closed by snow in the mountains near Big Pine, and at such times the Arrowhead Trail is sometimes used by travelers going to Salt Lake City. The Arrowhead Trail was not traveled by the writer except for the first 12 miles, to the Nevada State line, and only a few notes are given. It is reported that no supplies of any sort, including water, can be obtained until Searchlight is reached, about 38 miles from the National Old Trails road, so that the traveler should have plenty of gasoline and water. The following log is given for the road as far as it was traveled:

- 0.0 National Old Trails road at road branch 13.8 miles east of Goff (1.8 miles east of **Bannock station**, where water can be obtained). (See mile 232.3 of log on p. 123, or mile 32.6 of log on p. 125.) Go north, crossing railroad.
- 5.9 Road bends to right across a large wash.
- 6.5 An old road crosses from north to south along the wash.
- 6.8 Road forks. Geological Survey sign. Turn to left (north). Right-hand road, leading northeast, goes to **Golden West mine** (4.2 miles). Water is found in the mine shaft at that place, but it is obtainable only when someone is living at the mine to operate the hoist.
- 11.1 An old trail crosses from east to west. On the left (west) this trail leads to **Piute Spring**, about 8 miles distant, near the east foot of the Piute Range. It is not known whether automobiles can reach the spring, for the road is probably sandy in places. The spring is reported to have a very large flow.
- 14.0 An old road comes in on left (southwest). Geological Survey sign. Main road bends to right. The road was not traversed beyond this point, which is about 24 miles from Searchlight. About 4 miles beyond this point a road on the right, marked by a substantial sign, is said to lead to **Juniper Wells**, about 2 miles east of the main road, where good water can be obtained. A rope and bucket are necessary. About 3 miles beyond the branch to Juniper Wells another road is reported to lead east about 3 miles to a ranch where water may be obtained from wells and springs. No water can be obtained elsewhere until Searchlight is reached.

NEEDLES-PARKER.

NEEDLES, CALIF., TO PARKER, ARIZ. (61 MILES).

[For log of road in opposite direction see p. 241.]

This road is used by many travelers going between Los Angeles, Calif., and Phoenix, Ariz. (For choice of routes between Los Angeles and Phoenix see p. 115.) It is preferred by many to the routes leaving the National Old Trails road at Cadiz or at Danby. (See pp. 221-222.) Colorado River is crossed at Parker by a ferry, on which a charge of \$2 was made in 1918 for each vehicle carried. Gasoline can not be obtained between Needles and Parker (61 miles), so a sufficient supply should be carried. Water may usually be obtained at the Welch Well (12.5 miles from Needles) and sometimes at the D. & W. mine and by a detour of 3 miles at the West Well. There is a third well (Hanks Well) 31 miles from Needles, but in November, 1917, it was entirely dry, and it should

not be depended upon. Signs have been posted along the road by the Automobile Club of Southern California.

- 0.0 Needles post office. Go southeast on street along railroad or on street one block to right of railroad, following signs of the Automobile Club on the National Old Trails route to Topock, Kingman, and the East
- 0.4 Turn to right (south).
- 0.5 Turn to left (east).
- 0.6 Turn to right (south), cross two railroad tracks near large oil tanks, and ascend hill a short distance beyond. Several old roads cross the main road, but the latter is unmistakable.
- 4.3 Pass branch road on right, leading to mines in Sacramento Mountains.
- 4.5 Pass branch road on right, leading to mines.
- 5.7 Road forks marked by several signs. Take right-hand road. Left-hand road is National Old Trails road to Topock, Kingman, and the east. (See mile 254.4 of log on p. 124.)
- 11.6 Branch road on left. Continue on right-hand road.
- 12.9 Welch Well on left side of road in canyon, marked by Automobile Club sign. The water is brackish and should not be used for drinking if it can be avoided.
- 15.9 Cross low divide into a large, wide valley.
- 17.4 Branch road on right leads to Carsons Wells at north end of Turtle Mountains, 19 miles distant. (See p. 243.) Main road continues south.
- 27.1 Road forks. Right branch leads direct toward Parker; left branch leads to West Well (6.7 miles), where water of good quality can be obtained. From West Well three roads branch. One leads southwest up the main wash, returning to Parker road at mile 36.5 (or mile 39.5 from Needles by way of West Well); a second leads south into the Whipple Mountains; and a third leads northeast down a wash to Colorado River opposite Liverpool Landing. Continue on right branch unless it is necessary to run to West Well for water.
- 31.9 Hanks Well in bottom of wide wash. In November, 1917, this well was entirely dry. This well is sometimes called New West Well to distinguish it from the Old West Well (see mile 27.1).
- 35.4 Faint tracks branch on right (southwest). Automobile Club sign. Main road makes sharp turn to left and then to right.
- 36.5 Road comes in on left (northeast) from West Well (6 miles).
- 36.9 Faint tracks turn off on right (southwest).
- 39.5 Road comes in on right (northwest), crossing the main road. Continue straight ahead, passing old prospect shaft and dump on left at mile 39.8.
- 40.4 Branch road comes in on right (northwest). Enter narrow canyon, in places not wide enough for automobiles to pass. Drive carefully.
- 41.6 Old road branches on left.
- 41.7 Road comes in on left from American Eagle mine.
- 42.4 D. & W. mine. Water may be obtained here when some one is living at the mine.
- 44.0 Old well (Chambers Well) on right side of road. Nearly dry, and water contaminated by dead animals.
- 44.6 Road forks. Automobile Club sign. Right-hand road leads to Vidal (11 miles), 55 miles from Needles. Left-hand road leads to Parker.
- 49.8 Old road comes in on left (north).
- 51.7 Branch road on right leads to Calzona. Automobile Club sign.

- 54.3 Several roads intersect. Geological Survey and Automobile Club signs. Road on right (southwest) goes to Calzona (3.7 miles), Vidal, and Rice (formerly called Blythe Junction). (See mile 7.0 of log on p. 225.) Left-hand fork goes to Parker. Road becomes rough beyond this point, crossing several deep arroyos, and at times it may be badly washed out.
- 58.6 Road enters wash. Tracks may lead down wash on right. Main road turns to left across wash. Farther on it goes under railroad.
- 61.1 Branch road comes in on right along river. Road leads north close to river under railroad bridge to ferry landing. The location of the ferry is changed from time to time, according to river conditions. The road leading to the ferry in the last mile is accordingly changed, but the ferry company erects temporary signs wherever necessary, so that one should have no difficulty in reaching the landing.
- 61.3 **Ferry landing at Colorado River, opposite Parker.** Water and gasoline obtainable at the ferry. The ferry runs practically every day in the year. Parker is reached about half a mile beyond the river, where general supplies and hotel and garage accommodations are obtainable. The road from Parker to Phoenix and other points in southwestern Arizona is described in United States Geological Survey Water-Supply Paper 490-C, entitled "Routes to desert watering places in the lower Gila region, Ariz.," by Clyde P. Ross (in preparation).

PARKER, ARIZ., TO NEEDLES, CALIF. (61 MILES).

[For log of road in opposite direction see p. 239.]

This is the principal road used by travelers going from Phoenix, Ariz., to Los Angeles, Calif., by the northern route, through Parker to the National Old Trails road at Needles and along that road through Barstow and San Bernardino. (See p. 115 as to choice of routes between Phoenix and Los Angeles.) From the ferry that crosses Colorado River near Parker there are three optional routes to the National Old Trails road—one to Needles, described in this log, and the other two along the Parker branch of the Atchison, Topeka & Santa Fe Railway through Vidal and Rice (formerly called Blythe Junction) to Kilbeck, whence one branch goes to Danby and the other to Cadiz. (See p. 222 for note on choice of routes between Parker and the National Old Trails road.) The traveler should carry with him a plentiful supply of gasoline and oil. The road is traveled almost daily. It is usually in good condition, except the first few miles west of the ferry at Parker, which is hilly and sometimes badly washed out after rains. The road from Parker to the ferry, on the Arizona side, a distance of less than a mile, was not traveled by the writer, and the log is begun at the ferry on the west side of the river. The ferry operates practically every day in the year. In 1918 the charge for the transfer of automobiles was \$2 each. The position of the ferry landing changes from time to time according to river conditions, and the road for a short distance along the river bottom is accordingly changed, but the proprietor of the ferry erects temporary signs so that the traveler should have no difficulty in following the change. In November, 1917, the landing was situated a short distance north of the railroad bridge and the road led south under the bridge.

- 0.0 **Ferry landing, west side of Colorado River.** Follow temporary road signs for a short distance, leading under railroad through a culvert. Mileage may vary from this log.

- 2.7 Road bends to right (west) and ascends a short hill. A road comes in on left (east). The road in the next 4 miles is winding, crossing several deep arroyos.
- 7.0 Road forks (several branches diverging within a few hundred feet). Geological Survey and Automobile Club signs. Avoid branch on left (south) and two branches on right (north) and continue northwest. The road on left leads to Calzona, Vidal, Rice (formerly called Blythe Junction), and Cadiz. (See p. 225.)
- 9.6 Road comes in on left from Calzona. Automobile Club sign.
- 11.5 Avoid old road on right.
- 16.7 Road comes in on left from Vidal (11 miles). Automobile Club sign. Main road continues north, entering a canyon.
- 17.3 Old well (Chambers Well) on left. Well is nearly dry and water is contaminated by dead animals.
- 18.9 **D. & W. mine. Water may be obtained here if anyone is living at the mine to pump water from the shaft.**
- 19.6 Avoid road on right (leading to American Eagle mine). For a mile beyond this point the road leads through a very narrow canyon that in places is not wide enough for automobiles to pass. Drive carefully, watching for machines coming in the opposite direction.
- 20.9 Avoid branch road on left.
- 21.8 Avoid branch road on left (northwest).
- 24.8 Road forks. Automobile Club sign. Road on left is direct road to Needles; road on right (northeast) leads to **West Well**, whence a road leads northwest back to the direct Needles road at mile 34.2. **If the traveler needs water he should make the detour to West Well, adding less than 3.5 miles to the direct route, for water is not obtainable until Welch Well is reached, a distance of 24 miles.** West Well is located on the south side of a large wash 6 miles northeast of the road fork. A Geological Survey sign at the well directs the traveler northwest to the main road, a distance of 6.7 miles.
- 25.9 Road makes sharp bend to left, then to right. An old road comes in on left.
- 29.4 Hanks Well in bottom of wide wash. **In November, 1917, this well was entirely dry.** It is sometimes called New West Well to distinguish it from the Old West Well. (See mile 24.8.)
- 34.2 Road comes in on right (southeast) from West Well. Geological Survey and Automobile Club signs.
- 43.9 Road comes in on left (southwest) from Carsons Wells, at north end of Turtle Mountains, 19 miles. (See p. 243.)
- 45.4 Cross low divide and descend wash.
- 48.4 **Welch Well** on right side of road in canyon. Automobile Club sign. **Water is brackish** and should not be used for drinking if it can be avoided.
- 49.7 Road comes in on right (southeast).
- 55.6 Come into National Old Trails road. Automobile Club and other signs. Continue north. Road on right (southeast) leads to Topock, Ariz., and eastern points, crossing Colorado River by wagon bridge. (See mile 254.4 on log of National Old Trails road, p. 124.)
- 56.8 Road comes in on left.
- 57.0 Road comes in on left.
- 60.5 Cross two railroad switches on outskirts of Needles.
- 60.7 Turn to left away from railroad toward center of town.

- 60.8 Turn to right at cross streets and follow signs of Automobile Club into Needles.
- 61.3 Needles post office. Good hotels, garages, and stores. From Needles the National Old Trails road leads west to Goffs, Ludlow, Barstow, and San Bernardino. (See p. 124.)

NEEDLES-PARKER ROAD TO CARSONS WELLS.

On the road between Needles and Parker, 17 miles south of Needles, a road branches southwest to Carson's Wells, near the north end of Turtle Mountains. This road is used only by prospectors.

- 0.0 Road forks 17.4 miles south of Needles. (See mile 17.4 of log on p. 240 and mile 43.9 of log on p. 242.) Automobile-Club sign. Go southwest across a large alluvial valley.
- 15.0 (approximate) Road leads through gap between low lava hills about 2 miles northeast of the end of the Turtle Mountains.
- 16.1 Road forks. Branch to right (north) is said to lead to the Superstition Mountains, about 7 miles north. It is reported that water may be obtained from natural tanks in these mountains, but no information is available in regard to their exact location or dependability. Road to Carson's Wells bends to left (south).
- 17.8 Old prospect shaft on right, with road leading to it. From this place a trail, impassable for vehicles, is said to lead around the north end of the Turtle Mountains to **Mohawk Spring**, about 1 mile north and west of the shaft, and thence to Ward station on the Cadiz-Parker branch of the Atchison, Topeka & Santa Fe Railway. No definite information is available in regard to Mohawk Spring. The road continues south.
- 18.9 **Carson's Wells**. Two dug wells are located in the bottom of a wash near mesquite bushes. The water, which is of fair quality, stands about 15 feet from the surface, and is obtained by rope and bucket. In November, 1917, several persons were living at the wells doing prospecting work. A trail is said to lead from the wells south up a canyon to **Coffin Spring**, a distance of about 4 miles. **Another unnamed spring** is reported to exist in this canyon about 2 miles south of the wells, half the distance to Coffin Spring.

BANNING TO DALE (74 MILES).

This road is used by travelers going into a large area that forms a more or less isolated unit at the northeastern end of the San Bernardino Mountains and south of the Bullion, Sheep Hole, and adjoining mountains, in south-central San Bernardino County. (See Pls. X and XI.) Although roads that were much used when travel was by horse and wagon lead into the area from Victorville and Amboy, they are now almost impassable, particularly by automobile, because of heavy sand, and the area is practically isolated from the desert region to the northwest, north, and northeast. There are valuable mines (closed in 1918) near Dale, in the eastern part of the region, and several ranches lie at the west end of it.

The region is most easily reached by going east from San Bernardino through San Geronimo Pass (see Pl. VIII) to Banning. From Banning the road continues east along the Southern Pacific Railroad for about 13 miles and then turns north through the foothills of the San Bernardino Mountains. The log begins at Banning. The first 25 miles of the road lies outside of the area shown on Plates X and XI, but it is indicated on a supplementary map (fig. 5).

The roads in this region were mapped by J. S. Brown, and the log was written by him.

- 0.0 Start east on paved road at center of **Banning**, two blocks north of depot.
- 1.0 Reach Southern Pacific track and go east along railway.
- 5.8 **Cabezon** station and store. **Water** and gasoline. Continue east along railway.
- 12.9 Road forks. Geological Survey sign. The main road on right leads to **Whitewater** (1 mile), where **water** can be obtained, and to Coachella Valley. This road is described in Water-Supply Paper 490-A. The road on left (northeast) leads to Dale, and log is given for it. Road is sandy at beginning.

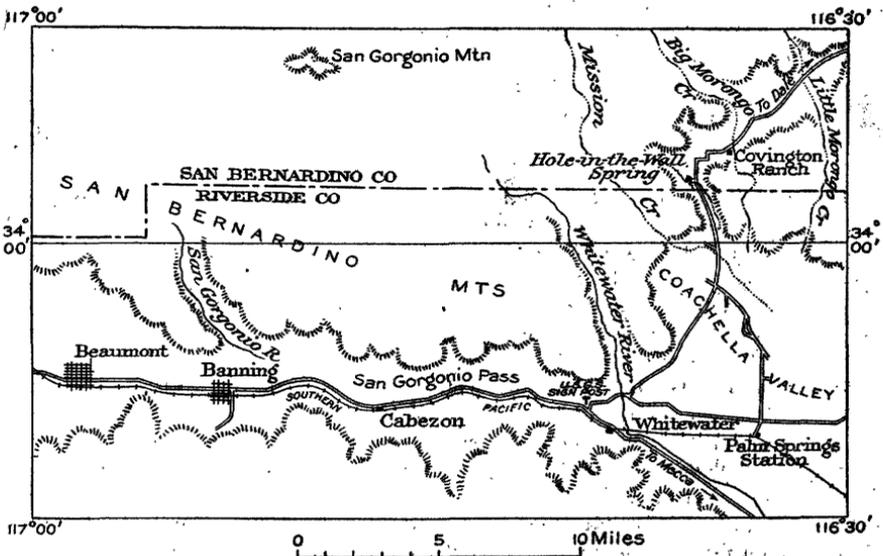


FIGURE 5.—Sketch map showing road from Banning to Covington ranch, Calif.

- 13.1 Turn east. Numerous signposts have recently been erected by the Automobile Club of Southern California along this part of the route, but their exact location is not known.
- 13.8 Turn north.
- 13.9 Turn northeast up a sandy and rocky slope. A number of houses are in the neighborhood.
- 14.4 A branch road leads south (right) to Whitewater. Continue northeast.
- 14.8 Cross bridge over Whitewater River.
- 14.9 A branch road to right at foot of hills leads to **Palm Springs** station (5 miles), where **water** can be obtained. For Dale take **left-hand** road, which is cut in side of steep hill. Automobile Club sign. Road reaches top of steep grade a short distance farther on, and turns northeast over sandy table-land.
- 18.3 Dim trail leads to left. Continue on well-defined road (right).
- 20.4 Crossroad leads northwest (left) to Mission Creek and southeast to Palm Springs station. Automobile Club sign. Continue straight ahead northeast. Road is sandy and difficult at places.

- 21.5 Branch road northwest (left). In January, 1918, a board sign directed along this road to the T=K ranch, 1½ miles away. Continue north-east (right).
- 22.6 Enter canyon passing through foothills of San Bernardino Mountains. Road goes north up gorge.
- 23.4 Water runs in canyon of **Morongo Creek** (also called Dry Morongo Creek) at this point during most of the year.
- 25.1 On a steep grade an Automobile Club sign points west along a footpath to **Hole-in-the-Wall Spring**. Water is obtainable about 100 yards away on this path.
- 25.3 Reach summit of pass through San Bernardino Mountains, overlooking Morongo Valley, which lies north.
- 25.5 Road turns east, passing a house not far from which there is a well.
- 26.0 The road turns due north.
- 26.2 Turn straight east. A branch road continues north.
- 26.5 Pass through a gate into Covington ranch.
- 26.8 **W. V. Covington ranch**. Mr. Covington usually keeps a small stock of provisions and a supply of gasoline, which is probably the last available until one returns to the place. There is also good water. The Covington place was formerly called Warren's ranch, and still frequently passes by that name. Continue north from ranch.
- 27.0 Cross **Big Morongo Creek**, a small stream of good water.
- 27.1 Pass through gate out of Covington ranch. Continue northeast on main road, which is at places sandy and rocky but a fair automobile road.
- 29.7 A branch road leads to the right to a house about a quarter of a mile away. Continue north on main road, finally ascending a long grade out of Morongo Valley.
- 34.0 Crest of divide at northeast end of Morongo Valley. The road descends a short steep slope into another valley sometimes called Yucca Valley.
- 35.4 A crossroad leads north and south, but the main road continues east. The road on the north is an old wagon road to The Pipes, but it was not passable in 1918. The road on the south is said to lead to a place called **Warrens Tanks**, about 2 miles away, where water is obtainable in a small tunnel.
- 38.2 Branch road turns north to The Pipes. (See p. 246.) Geological Survey sign. Main road continues east 0.1 mile to a house, with windmill.
- 38.3 **Warrens Well**. Water of fair quality is kept in a reservoir. A road is said to turn to the left (just east of this well) and go north to Surprise Spring. Nothing can be seen of this road at the well, but it can probably be found a few hundred feet farther north. It is understood that automobiles can reach Surprise Spring by this road. From Surprise Spring roads lead east to Mesquite Spring and west to Means Well. Both of these are more or less sandy and very difficult for automobiles. From Warrens Well continue east across a small "dry lake" on the main road, which for the next 20 miles is an excellent desert road. A few trails lead north and south in the next 3 miles, but the main road is unmistakable.
- 43.0 Road forks, the right branch leading southeast to Quail Spring, Pinyon Well, etc. (See p. 247.) Geological Survey sign. Continue east on right-hand road.
- 47.2 A branch road turns to the left, leading to a well usually known as **Coyote Well**, one-quarter of a mile away, over which a windmill is

- visible. Take the branch road if water is desired, otherwise continue east (right). The water at Coyote Well is very good for drinking.
- 48.0 Branch road returns from well. Continue east.
- 58.7 House on the north side of the road that may be occupied by miners. There are wells on north and south sides of the road, and water is obtainable, but it is only a mile to Twenty-nine Palms. Continue east.
- 59.0 A branch road leads southeast (right). Continue east (left).
- 59.5 A branch road leads northeast (left) to Mesquite Spring. Continue east (right).
- 59.7 **Twenty-nine Palms.** The palms stand in a long row south of the road. There is a house at this point, and **two or three springs are within a few hundred feet.** Paths lead to the springs, which can be found easily. Any spring that is in good condition is satisfactory. Continue east toward Dale. A branch road also leads north from the house to Mesquite Spring but is not plainly visible. (See p. 248.)
- 59.9 A branch road leads south to Pinyon Well and various points. (See p. 248.) Continue east.
- 61.9 Enter a small canyon which affords a pass through a low ridge of granite.
- 62.9 Emerge from pass through granite ridge.
- 67.0 The road is very sandy for the next 2 miles.
- 69.0 A branch road turns southeast (right). Continue on left branch. The road is not so sandy for a distance.
- 72.0 Sand becomes very bad again. Deflate tires if necessary.
- 78.8 **Old Virginia Dale.** The remains of a few adobe houses, a broken windmill over a well that is badly caved, and a pump house on a little eminence to the east indicate the place. From Old Dale a road goes north to Amboy, about 40 miles away, on the Atchison, Topeka & Santa Fe Railway. (See p. 221.) It is very bad—almost impassable for automobiles. One may get water, however, at a well **2¼ miles northeast on this road.** It is possible to approach safely by automobile within about a mile of this well, but after that the drift sand is deep and very difficult to cross. A windmill over the well supplied water to range cattle in 1918. **The water is usable.** To reach the mining camp at New Dale continue east over the hill by the pump house at Old Virginia Dale and then follow the road southeast. This road was not traveled by the writer. It is known to be sandy. The distance from Old Dale to New Dale is reported to be 6 miles. There was no one at New Dale in January, 1918. From New Dale a road leads south to Cottonwood Spring, and Mecca. This road is described in Water Supply Paper 490-A. It is reported that a pumping plant is located about 4 miles east of Old Dale, from which water is pumped to the mines at New Dale, when they are operating.

WARRENS WELL TO THE PIPES.

- 0.0 At Geological Survey sign on west side of **Warrens Well** (see mile 38.3 of log on p. 245). Turn west of north. Steep, sandy grade for first mile.
- 0.7 Enter pass through granite spur.
- 1.3 Emerge north of granite spur on broad table-land.
- 3.1 Dim trail leads southwest (left). Continue northwest.
- 4.5 Descend sandy hill into canyon.

- 4.8 Road turns west up wide wash. At this point a trail on right (east) also leads to a windmill a quarter of a mile away in wash. This is **Pipes Wash Well**, often called simply "**The Windmill**." Water is **probably satisfactory**, but road to well may be too sandy for automobiles. Continue west up very sandy wash.
- 6.0 At about this point road turns slightly to left up a side wash and leads out over rolling hills.
- 10.1 Road forks. Geological Survey sign. Left-hand road goes to **The Pipes**, right-hand road to **Burns Canyon** and **Bear Valley**. Take road on left (south).
- 12.0 Branch road leads northwest to **Burns Canyon**. Geological Survey sign. Continue south. **Burns Spring** is about **5 miles distant**. The water is said to be good and the flow is perennial.
- 12.4 Cabin at **The Pipes**. Good water in small reservoir east of house fed by ditch or in canyon one-quarter of a mile up.

BANNING TO QUAIL SPRING, KEY'S RANCH, PINYON WELL, AND ELDORADO MINE.

This road branches from the Banning-Dale route, 43 miles east of Banning, and will generally be used most by persons coming from the west. Distances are therefore made to read from Banning, and the traveler is referred to the Banning-Dale log for the route as far as the road fork.

- 0.0 **Banning**. Follow log of road to Dale, on page 244, as far as mile 43.0.
- 43.0 Road forks. Geological Survey sign. Take the right-hand road to **Quail Spring**. The left-hand road continues east to Dale. Proceed southeast up a long wash that is rather sandy at places.
- 50.5 Geological Survey sign. The main road swings east (left) and a branch road goes south to **Quail Spring**, where good water is obtainable in a reservoir one-tenth of a mile away. If water is not desired turn east (left).
- 51.5 A plain but little-used road leads south (right) to a cabin about 2 miles away. Main road continues east.
- 53.3 Road forks. Geological Survey sign. Road on right leads to the **Lost Horse Well** and mine, located about 1 mile south of the south edge of the area shown on Plate XI. **Lost Horse Well is not a good watering place**. Continue east (left).
- 55.7 A plain road branches to left, going to **Key's ranch**, half a mile away. There is another branch a little farther on. Continue to the right.
- 55.9 A branch road goes north to **Key's ranch**, visible about half a mile away. Good water may be had there if desired; otherwise follow the main road southeast. Geological Survey sign.
- 56.0 The road forks, and one branch leads east, the other southeast. Take the southeast (right) branch, which is less sandy and usually better, although the two unite not far away.
- 57.0 A dim road branches, going south to **Lost Horse Well**. Continue on plain road to left.
- 58.2 A branch road enters on the west, the fork that parted at mile 56.0. At very nearly the same place a branch road turns northeast (left) to a windmill which can be seen about half a mile away. This is the **Desert Queen Well**. Water was not obtainable in **January, 1918**. Continue east (right), avoiding the well.
- 58.7 A branch road returns from windmill noted above. Continue east.

- 60.0 A branch road leads east to the Desert Queen mine, 2 miles away. Turn to right and go southeast. The road is not greatly used and is rather sandy at places in the next few miles.
- 60.7 A faint cross trail leads east and west. Continue southeast, straight ahead.
- 61.8 Road forks. County sign. Road on right (southeast) leads to Cottonwood Spring, Eldorado mine, and Pinyon Well, all located in the area south of that shown in Plate XI. The log of the road to these places is given in Water-Supply Paper 490-A. The road on left leads to Twenty-nine Palms. It was not traveled beyond this point. It continues north of east for about 4 miles, two branches coming in from the south, and then turns north to Twenty-nine Palms, about 11 miles from the fork.

TWENTY-NINE PALMS TO MESQUITE SPRING (7 MILES).

- 0.0 Go north from house at **Twenty-nine Palms**.
- 2.4 A road leads northeast (right). Continue north (left).
- 3.0 Cross a small "dry lake." Continue north and northwest. Ignore a few tracks turning to the right.
- 5.9 Road is dim and branches lead left and right (northwest). Either one may be followed, but right-hand road is best for automobiles. It leads north across a "dry lake," and road may not be visible at places.
- 7.0 A few hundred feet west is **Mesquite Spring**. Water is of fair quality. Cattle trails and tracks point the way and it is easily found. From Mesquite Spring a road continues northwest across the playa and ascends a long and very sandy wash to Surprise Spring, about 12 miles away. The road is said to be nearly impassable for automobiles going north, but they may go east from Surprise Spring to Mesquite Spring with less difficulty.

INDEX TO WATERING PLACES.

In the following pages is given a list of all watering places shown on the detailed maps (Pls. IX, X, XI, XII, XIII). References are given to pages on which the individual watering places are mentioned, and the plate numbers of the maps on which they are shown are also given. In addition, brief descriptions are added of wells or springs that are indicated on the map, but that are not on any regularly traveled road and not described in any log. A large number of springs are located in mountains not near any roads. The location of most of these, as shown on the maps, has been obtained from topographic maps, on which they are accurately shown. It was not possible to visit those situated off the main roads, and usually very little or no information could be obtained in regard to them. No information is given in regard to a number of springs in the Sierra Nevada (Pl. IX and northwest part of Pl. X). Probably many springs exist in the mountains that are not shown on the maps and are known only to a few prospectors. In several places statements are made about wells or springs that have been shown on previously published maps, but which are no longer reliable watering places. Individual mention is not made of a large number of wells located in certain areas that are occupied by numerous homesteaders, such as Antelope Valley and parts of Mohave Valley. All railroad stations including section-crew headquarters, where water was obtainable when these data were collected, have been listed, whether any one lives at the place or not. The railroad companies state that sometimes

section headquarters may be moved from one station to another, the location of cisterns or other tanks being changed accordingly. Information as to changes in roads and watering places that was received as late as April, 1920, has been incorporated in this list.

Acme.—A station on Tonopah & Tidewater Railroad. (See Pl. XI.) Water obtainable at the station.

Adelanto post office.—Pages 132, 134, 135, 137, 141; Plate X.

Afton.—A station on the Los Angeles & Salt Lake Railroad, in Caves Canyon (T. 11 N., R. 6 E. San Bernardino meridian, Pl. XI), not reached by any regularly traveled road. The railroad has a deep well, from which good water is obtained.

Aguá de Tomaso.—See Tomaso Spring.

Alray station.—Pages 119, 129; Plate X.

Amargosa River.—Water flows in the channel of Amargosa River at several points, but it is believed it is too salty to be usable.

Amboy.—Pages 123, 125, 221; Plate XII.

Ames Well.—This well is reported to be at the southeast side of a playa ("dry lake") about 6 miles east of Means Well, probably in the western part of T. 4 N., R. 6 E. San Bernardino meridian. (See Pl. XI.) Another well (unnamed) is said to be located on the west side of the same playa. These wells are used for watering cattle. It is doubtful if they can be reached by automobile, because of heavy sand to the west of them.

Antelope Valley.—Water may be obtained at numerous ranches in this valley east of Lancaster and Palmdale. (See Pls. IX and X.)

Apple Valley.—Water may be obtained at a number of ranches in Apple Valley southeast of Victorville. Most of these are not shown on the map (Pl. X), as many of the homesteaders occupy their ranches for only a part of the year, and it was not ascertained which of them are reliable watering places.

Aqueduct, Los Angeles.—See Los Angeles Aqueduct.

Archer.—Pages 222, 226; Plate XII.

Argos.—Pages 122, 126; Plate XI.

Argus Range, springs in.—Several springs occur on the east slope of the Argus Range. The water from Cabin, Middle, Peach, Dripping, Indian Joe, Searles, and Graham springs is piped to Trona. (See Pl. X.) Water can be obtained at all these springs except Graham Spring, which is tightly inclosed. Water can be obtained, however, at Willett's place, 1 mile east of Graham Spring, and at the Graham & Jones mine, also known as Homewood, 2 miles west of Graham Spring.

Atolia.—Pages 132, 133, 165, 166, 178, 181; Plate X.

Auslands Well.—Pages 186, 190, 191; Plate XI.

Aztec Spring.—Page 218; Plate XI.

Bagdad.—Pages 122, 126, 221; Plate XII.

Baker.—Page 205; Plate XI. This station was formerly called Berry.

Balch.—A station on the Los Angeles & Salt Lake Railroad, in T. 11 N., R. 9 E. San Bernardino meridian. (See Pl. XI.) Water is obtainable from a cistern at the houses of the section crew. It is practically impossible for automobiles to reach this place on account of sand.

Banning.—Pages 244, 247; figure 5.

Bannock.—Pages 123, 125, 239; Plate XIII.

Barbers Well.—Page 229; Plate XII.

Barnett Mine Well.—About 9 miles west of Lanfair and about 1 mile south of the Emdee Well. (See Pl. XII.) In 1918 the well was reported to be equipped with a hand pump and its yield to be about 25 barrels a day.

Cave Springs.—Pages 197, 201; Plate XI.

Chambers Well (abandoned).—Pages 240, 242; Plate XIII.

Chaparrosa Spring.—This spring is shown on the San Gorgonio topographic map as about $2\frac{1}{2}$ miles southeast of The Pipes (see Pl. XI), from which it is reached by a trail. No definite information is available in regard to it.

Chase.—Page 231; Plate XII.

China ranch.—About 4 miles south and a little east from Tecopa, on old road leading south to Silver Lake and Saratoga Springs, which is now impassable in places. (See p. 196 and Pl. XI.) It is reached from Tecopa. Water is obtained from a strong spring. The ranch is also known as the Morrison ranch.

Cima.—Pages 212, 230, 231, 232, 233, 237, 238; Plate XII.

Cinco.—Pages 160, 162; Plate IX.

Clark Mountain, springs in.—Several springs occur in Clark Mountain, 15 to 20 miles northwest of Nipton (see Pl. XII), including Pachalka and Whitefield springs. No information is at hand in regard to them. There is a well yielding good water at some houses near the mouth of a canyon leading southeastward from Greens mine, on the northeast slope of the mine.

Clark ranch.—Water is reported to be obtainable at this place, in sec. 24, T. 9 N., R. 9 W. San Bernardino meridian. (See Pl. X.) It is probably about 2 miles east of a place known as Flowing Well. The ranch was not visited by the writer, and it is not known whether water is always obtainable there.

Clipper Mine.—Page 227; Plate XII.

Clipper Mountain, spring at northeast end of.—A spring is reported to exist at the northeast end of Clipper Mountain, almost 9 miles west of Fenner. (See Pl. XII.) Its exact location is not known, and the information in regard to it is very indefinite.

Coffin Spring.—Page 243; Plate XIII.

Colton Well.—Page 228; Plate XII.

Cooks Well.—This well is reported to be in T. 10 N., R. 14 E. San Bernardino meridian, about 4 miles southwest of Domingo's ranch. (See Pl. XII.) It is not near any road, but as it is so arranged that water runs into a trough where cattle can be watered it can probably be reached by trails.

Coolgardie Camp.—Not a reliable watering place. (See p. 191; Pl. X.)

Copper City.—Pages 179, 180, 182, 185; Plate X.

Cottonwood.—See Hicks station.

Cottonwood Spring.—A spring of this name is shown on the Ivanpah topographic sheet as 1 mile south of Brant. (See Pl. XII.) No information is available concerning it. It should not be confused with other springs of the same name. (See below.)

Cottonwood Spring.—On west side of Providence Mountain. (See pp. 221, 228; Pl. XII.) This should not be confused with springs of the same name, one near Brant, about 30 miles to the northeast, and the other 35 miles east and south of Victorville and 2 miles northwest of Old Woman Spring.

Cottonwood Spring.—About 2 miles northwest of Old Woman Spring and 35 miles southeast of Victorville. (See p. 146 and Pl. XI.) Should not be confused with other springs of the same name. (See above.)

Cove Spring.—Pages 221, 228; Plate XII. Should not be confused with Cave Spring, in the Avawatz Mountains.

Covington ranch.—Page 245; Plate X, figure 5. Also known as Warren's ranch but should not be confused with Warrens Well, several miles farther northeast.

- Coyote "Dry Lake," wells near.**—In addition to Coyote Well (see pp. 214, 215), water is available at several places around Coyote "Dry Lake," 15 miles northeast of Daggett. Two flowing wells are located at the northwest end of the "lake," probably in sec. 28, T. 11 N., R. 2 E. San Bernardino meridian. (See Pl. XI.) One of these wells yields about 25 gallons a minute. Small springs exist among sand hummocks near these wells. The water is warm, but it probably can be used for drinking.
- Coyote Holes.**—Near the head of Kingston Wash, between the Kingston Range and the Shadow Mountains. (See Pl. XII.) These holes were not visited by the writer and no information is available in regard to them, except that the water is reported to be brackish and the supply unreliable. There are several other springs in the desert with this or a similar name.
- Coyote Well.**—About 16 miles northeast of Daggett, in T. 11 N., R. 2 E. San Bernardino meridian. (See pp. 214, 215; Pl. XI.) This well should not be confused with one of the same name in T. 1 N., R. 7 E. San Bernardino meridian.
- Coyote Well.**—In T. 1 N., R. 7 E. San Bernardino meridian, south end of area shown on Plate XI, page 245. This well should not be confused with one of the same name in T. 11 N., R. 2 E. San Bernardino meridian. (See above.)
- Cozy Dell.**—Pages 119, 129; Plate X.
- Crescent Peak, water hole three-quarters of a mile west of.**—This is shown on the Ivanpah topographic sheet. (See Pl. XII.) It is reported to yield about 1 gallon a minute.
- Crescent Wells.**—These are shallow dug wells in a wash on the road from Nipton to Searchlight, 5 miles east of Nipton. (See Pl. XII.) No data are available in regard to them.
- Cronise Valley, springs and wells in.**—Page 220; Plate XI.
- Crucero.**—A station at the junction of the Los Angeles & Salt Lake Railroad and the Tonopah & Tidewater Railroad, 25 miles north of Ludlow. (See Pl. XI.) Water is obtainable here as long as the railroads keep an operator at the station, but as it is possible that this station may be discontinued, inquiry should be made by any person who expects to travel in this region. (See pp. 205, 220.)
- Crutts post office.**—Pages 182, 185; Plate X.
- Crystal Spring.**—In a canyon on north side of Kingston Range. (See Pl. XII.) This spring is probably accessible by a road leading eastward to it from Tecopa, although whether it can be reached by automobiles is not known. No definite information is available in regard to it.
- Cuddeback "Dry Lake," well at northeast end of.**—Pages 178, 181; Plate X.
- Cushenberry Springs.**—Pages 143, 144; Plate XI.
- Cut Spring.**—About 5 miles northwest of Cima, among low granite knobs. (See Pl. XII.) There are two springs or wells about 1,000 feet apart and separated by a low hill. In 1917 the western spring, about one-tenth of a mile west of the main road, was equipped with a suction pump. Water is hauled from this spring to supply ranches at Cima. The water is of good quality. The other spring is close to the main road, almost one-tenth of a mile north of a road leading to the first-mentioned spring. When it was visited the sanitary conditions around it were bad.
- Daggett.**—Pages 121, 127, 213, 214, 216, 217; Plate XI.
- Dale cattle well.**—Pages 221, 246; Plate XII.
- Dale pumping plant.**—Pages 221, 246; Plate XII.
- Danby.**—Pages 123, 125, 222, 226, 227; Plate XII.

D. & W. mine.—Pages 240, 242; Plate XIII.

Dante Spring.—According to Waring,⁷⁷ this spring is located near the north base of a butte at the northeast end of Soda Lake about 3 miles east of Baker station on the Tonopah & Tidewater Railroad. The spring was not visited by the writer, and it is not known whether it is a reliable watering place.

Death Valley mine.—It is reported that much water is encountered in this mine, 2½ miles southeast of Cima (see pp. 230, 237, 238; Pl. XII), but it is not known whether water can be obtained at the mine if it is not in operation.

Deer Spring.—This spring is shown on the Ivanpah topographic map as about 1½ miles almost due west of a high rounded summit about 6 miles northwest of Cima. (See Pl. XII.) It is not near any road and nothing is known about it.

Del Sur.—Page 159; Plate IX.

Denning Spring.—Pages 197, 201; Plate XI.

Desert King Spring.—Pages 173, 175; Plate XI.

Desert Queen Well.—Page 247; Plate XI. Not a reliable watering place.

Desert station.—A station on the Los Angeles & Salt Lake Railroad, 5 miles north of Nipton. (See Pl. XII.) **Water** is obtainable at the railroad pumping plant. A road leads along the railroad at this station, but it is not always passable for automobiles because of sand or washouts.

Desert Well.—This well is shown on many desert maps as being in the western part of T. 32 S., R. 38 E. Mount Diablo meridian, on the Mojave-Atollia road. (See Pl. X.) **It is caved in and no longer used.** Wells are located at homesteads from 1 to 2 miles southwest of location of the old well.

Devore.—Page 118; Plate X.

Dobie ranch.—Pages 132, 134, 137, 138, 140; Plate X.

Domingo's ranch.—Page 229; Plate XII. (See also Beecher Spring.)

Dove Spring.—This is shown on the Ivanpah topographic sheet as 7 miles east of Ivanpah, in a canyon that drains north, emerging from the New York Mountains east of Moore station. (See Pl. XII.) Nothing is known in regard to this spring.

Drinkwater Spring.—In the west-central part of T. 16 N., R. 4 E., San Bernardino meridian. Reached by a branch from the road from Silver Lake to Leach Spring. (See pp. 173, 175 and Pl. XI.) This road leads to a cabin near which is a well. Drinkwater Spring is reported to be about 300 yards east or southeast of the cabin, from which it is reached by foot trails. A branch road to the south, before the cabin is reached, leads to the spring. The water has been piped to a corral near by.

Dripping Spring.—Plate X. (See Argus Range, springs in, p. 249.) Some maps show a spring of this name on the west side of the Providence Mountains. (See p. 228.)

Dry Morongo Creek.—Page 245; Plate X, figure 5. Also called Morongo Creek.

Eagle Pass Well.—A well is reported to be located in the canyon of Eagle Pass, between 8 and 9 miles southwest of Needles on a road leading to the mining camps. (See Pl. XIII.) The well is believed to be in a canyon that comes in from the northwest about 1½ miles west of the point at which the road enters the main canyon. No further information is available. It is also reported that water is obtainable at mines farther southwest, but their exact location is unknown.

Earlys Spring.—Pages 183, 184; Plate X.

⁷⁷ Waring, G. A., Springs of California: U. S. Geol. Survey Water-Supply Paper 338, p. 344, 1915.

- Eckley's ranch.**—This place, in the northeast corner of sec. 12, T. 31 S., R. 45 E. Mount Diablo meridian, on the road between Crutts post office and Copper City (see Pl. X) was listed as a watering place on signs at Copper City and at the road fork, 1.4 miles southeast of that point, but since the sign was erected Mr. Eckley has removed his well equipment and left the valley. It is not certain that water can be obtained between Copper City and Crutts post office.
- El Mirage post office.**—Page 141; Plate X.
- Elora.**—Page 231; Plate XII.
- Emdee Well.**—About 10 miles west and north from Lanfair and about one-quarter of a mile south of the Beatty Well. (See Pl. XII.) The well is about 18 feet deep, and in January, 1918, it contained about 8 feet of water. It then furnished about 25 barrels of water a day, and water was drawn from it by several homesteaders.
- Erie.**—A station on the Los Angeles & Salt Lake Railroad 8 miles northeast of Jean. (See Pl. XII.) Water is believed to be obtainable at the station.
- Essex.**—Pages 123, 125; Plate XII.
- Everet Well.**—Pages 229, 231; Plate XII.
- Fairmont.**—Pages 157, 159; Plate IX.
- Farm Well.**—Five miles north and east from Trona. Another well half a mile farther northeast is used as a supply for manufacturing purposes, at Trona. The water is of poor quality for drinking. (See Pl. X.)
- Fenner.**—Pages 123, 125, 228, 229, 231; Plate XII.
- Fenner Spring.**—Plate XII. This spring is reached by an old road from Fenner.
- Ffields.**—A station on the Los Angeles & Salt Lake Railroad about 20 miles northeast of Yermo. (See Pl. XI.) Not on any regularly traveled road. Water is obtainable at section-crew houses.
- Flowing Well.**—On the east side of Rogers "Dry Lake," near its south end, probably in sec. 27, T. 9 N., R. 9 W. San Bernardino meridian. (See Pl. X.) The well is about 0.3 mile south of a road that leads east from the clay flat opposite a small island or mound that rises out of the clay flat. (See p. 155.)
- Flynn.**—A station on the Los Angeles & Salt Lake Railroad, in T. 10 N., R. 12 E. San Bernardino meridian. (See Pl. XII.) Not on any regularly traveled road. Water obtainable from cistern at houses of section crew.
- Fourth of July Spring.**—This spring is reported to be near Quall Spring, several miles north of Leach Point. (See Pl. XI.) No definite information could be obtained in regard to it. (See p. 178.)
- Francis Spring.**—Pages 206, 207; Plate XII.
- Freeman.**—Pages 161, 162; Plate X.
- Fremont.**—Pages 132, 133; Plate X.
- Fremont Valley.**—A number of wells, several of them flowing, have been obtained by homesteaders at the southwest end of a "dry lake" near Cantil, known as Fremont Valley.
- Gannons Camp.**—Page 228; Plate XII.
- Garlic Spring.**—Pages 193, 195, 215; Plate XI.
- Garlock.**—Pages 164, 165; Plate X.
- Glasgow.**—A station on the Los Angeles & Salt Lake Railroad near the boundary between T. 10 N., Rs. 10 and 11 E. San Bernardino meridian. (See Pl. XII.) Not reached by any regularly used road. Water obtainable from a cistern at houses of railroad section crew.
- Goffs.**—Pages 123, 125, 233, 237; Plate XII.
- Golden Valley.**—About 6 miles east of Atolia. (See Pl. X.) Several wells were drilled at homesteads in this valley, but only one or two were equipped

- with pumps in 1918, and their continued use is uncertain. (See also Cuddeback "Dry Lake" Well.)
- Golden West mine.**—Page 239; Plate XIII.
- Goldstone.**—Page 190; Plate XI. No water obtainable unless miners are at camp.
- Gold Valley Spring.**—A spring of this name is indicated on the Ivanpah topographic map as about three-quarters of a mile northeast of Granite Well, about 22 miles north and west of Fenner (see Pl. XII), but the writer did not find it.
- Goler Well.**—Pages 164, 165; Plate X.
- Goodsprings.**—Pages 206, 207, 235; Plate XII.
- Government Holes.**—Pages 237, 238; Plate XII.
- Graham Spring.**—Plate X. See Argus Range.
- Granite Spring.**—There is a spring of this name in the north-central part of T. 14 N., R. 11 E. San Bernardino meridian. (See Pl. XII.) No definite information is available in regard to it, but it is believed to be used as a watering place for cattle. It should not be confused with Granite Well or Granite Wells. (See below.)
- Granite Tank.**—A tank of this name is reported by Leroy Palmer, of the United States General Land Office, to exist at the southeast end of the Little Plute Mountains. (See Pl. XII.) Its exact location is not known.
- Granite Well.**—Pages 229, 231; Plate XII. About 23 miles northwest of Fenner. Should not be confused with Granite Wells, 23 miles east of Johannesburg. (See below.)
- Granite Wells.**—Pages 172, 176, 183, 184; Plate X. About 23 miles east of Johannesburg. Should not be confused with Granite Well, 23 miles northwest of Fenner. (See above.)
- Grommet.**—Pages 223, 225; Plate XIII.
- Hackberry Spring.**—Pages 233, 236; Plate XII.
- Halleck post office.**—See Oro Grande.
- Halloran Spring.**—Pages 209, 211; Plate XII.
- Hanksite.**—Pages 163, 168, 169; Plate X. This town is now called Westend.
- Hanks Well.**—Pages 240, 242; Plate XIII. In November, 1917, this well was entirely dry.
- Harper Camp and Springs.**—Plate XI. A former mining camp of this name in the southeast end of the Avawatz Mountains, 10 miles or more northwest of Silver Lake, is abandoned, and the road to it is washed out. There are at least two springs, known as Harpers Spring and Harpers Willow Spring, in the gulch along the road to the camp, but no definite information is available in regard to them.
- Harper Valley.**—Includes T. 11 N., Rs. 3 and 4 W. San Bernardino meridian. (See Pl. X.) A number of ranches lie in this valley, and several wells have been drilled, including two flowing wells at Black's ranch. (See Black's ranch, McDonald's ranch, and p. 154.)
- Hart.**—A mining camp about 8 miles east of Barnwell. (See Pl. XII.) Water is hauled into the camp and is obtainable only when the mine is in operation.
- Harvard.**—A station on the Los Angeles & Salt Lake Railroad 10 miles northeast of Yermo. (See Pl. XI.) Water obtainable from a railroad pumping plant.
- Hawes station.**—Pages 136, 151, 153; Plate X.
- Hayden.**—Page 231; Plate XII.
- Hector.**—Pages 122, 126; Plate IX.
- Helendale ranch.**—Page 136; Plate X.

Helen station.—Pages 120, 128; Plate X.

Henry Spring.—Reported to be about $1\frac{1}{2}$ miles almost due west of Granite Spring, in the northwestern part of T. 14 N., R. 11 E. San Bernardino meridian. (See Pl. XII.) It is said to flow about 1 gallon a minute. The spring is used by Mr. S. E. Yates, of Cima, as a watering place for cattle. It can be reached by a road leading from the main road between Valley Wells and Halloran Spring.

Hesperia.—Pages 119, 129, 131, 134, 138; Plate X.

Hicks station (Palliser post office).—Pages 120, 128; Plate X.

Hidden Spring.—Pages 187, 188; Page XI.

Higgins Well.—Plate X. In August, 1919, water was reported to be obtainable at this well, which is 12 miles north of Randsburg.

Hinkley.—Pages 151, 153, 154; Plate X.

Hole-in-the-Wall Spring.—Page 245; Plate XI, fig. 5.

Homer.—Pages 123, 125; Plate XIII.

Honeymoon Spring.—Page 228; Plate XII.

Horse Spring.—This spring is on the north side of the Kingston Range, about 26 miles west and a little south from Goodsprings. (See Pl. XI.) It is believed that it can be reached by automobile from Mesquite Valley. No definite information is available in regard to the spring.

Hytens Spring.—This spring is shown on the township plat of a recent General Land Office survey in the southwestern part of T. 10 N., R. 9 E. San Bernardino meridian. (See Pl. XI.) A natural tank is shown on the same plat about 1 mile southwest of the spring. No information is available as to either the spring or the tank. Hytens Spring should not be confused with Hytens Well, 10 miles east of Silver Lake on the road to Valley Wells. (See below.)

Hytens Well.—Pages 206, 207, 209, 211; Plate XII. This well should not be confused with Hytens Spring, in the southwestern part of T. 10 N., R. 9 E. San Bernardino meridian. (See above.) Three shallow wells are reported at a stamp mill about $1\frac{1}{2}$ miles south of Hytens Well.

Ibex Spring.—Near Ibex mine, about 15 miles southwest of Zabriskie. (See Pl. XI.) The spring is believed to be in good condition. It can be reached from Zabriskie and Tecopa, but the road from Saratoga Springs and south Death Valley is so sandy that it is impassable for automobiles.

Ibis.—Pages 123, 125; Plate XIII.

Indian Creek.—It is stated that water runs throughout the year at the head of Indian Creek, 18 miles almost due west of Cima. (See Pl. XII.) A pipe line formerly carried the water to the Whitney mine, but this was taken up in 1917. The road which leads to the west of the creek, from Marl Springs to Silver Lake, is said to be impassable for automobiles because of heavy sand.

Indian Joe Springs.—Plate X. (See Argus Range.)

Indian Spring.—Pages 179, 180, 186, 189; Plate X. Should not be confused with Indian Wells, northwest of Inyokern, on the same plate, nor with Indian Spring, $7\frac{1}{2}$ miles northeast of Barnwell. (See below.)

Indian Spring.—A spring of this name is shown on the Ivanpah topographic sheet $7\frac{1}{2}$ miles northeast of Barnwell, on the south side of the New York Mountains. (See Pl. XII.) No information is available in regard to it. This spring should not be confused with a spring of the same name 34 miles north of Barstow. (See above.)

Indian Wells.—Pages 161, 162; Plate X.

Indian Wells Valley.²⁸—Near Brown and Inyokern (upper left-hand corner of Pl. X). Also known as Brown Valley or Inyokern Valley. Water may be obtained at a number of homesteads in this valley.

Inyokern.—Pages 161, 163, 171; Plate X.

Ivanpah.—Pages 232, 234, 236; Plate XII. The old town of Ivanpah was formerly 6 miles northwest of the present railroad station known by that name, the latter at that time being called Leastalk. Old Ivanpah is now abandoned, and Leastalk is known as Ivanpah.

Java.—Pages 123, 125; Plate XIII.

Jean.—Page 235; Plate XII.

Johannesburg.—Pages 164, 166, 167, 170, 171, 177; Plate X.

Johnston ranch.—Pages 143, 144; Plate XI.

Juniper Wells.—Page 239; Plate XIII.

Kane Spring.—About 7 miles south and a little west of Newberry Spring.

(See Pl. XI.) A road leads to it from the National Old Trails road east of Newberry Spring (see pp. 122, 127), but it is said that automobiles can not reach the spring by this road because of the heavy grade. It is understood that passable roads lead to it from the north end of Ord Mountain. (See p. 218.) No definite information is available in regard to the spring. It should not be confused with Koehn Spring, 3 miles northeast of Cantil. (See below.)

Keenbrook.—Pages 119, 129; Plate X.

Kelso.—Pages 221, 231; Plate XII.

Kessler Spring.—Page 212; Plate XII. A pipe line leads from the spring 2 miles east to a water trough. When visited in January, 1918, there was no water in the trough, but it was understood that the pipe line was to be repaired and water run into it.

Key's ranch.—Page 247; Plate XI.

Keystone Spring.—In a canyon high up on the west slope of Spring Mountain, about 6 miles northwest of Goodsprings. (See Pl. XII.) Reported to yield less than half a gallon a minute.

King.—A station on the Los Angeles & Salt Lake Railroad in T. 11 N., R. 7 E. San Bernardino meridian (see Pl. XI), not reached by any regularly used wagon road. Water is obtainable from a cistern at the houses of the section crew.

Kingston Springs.—At the north end of the Shadow Mountains, approximately in T. 18 N., R. 10 E. San Bernardino meridian (unsurveyed; see Pl. XII). The springs were not visited and nothing is known of their present condition. The road leading west from these springs is not passable for automobiles. These springs were well-known watering places on the old wagon road to Salt Lake, but they have lost their importance.

Klinefelter.—Pages 123, 125; Plate XIII.

Klondike.—Pages 122, 126; Plate XI.

Knights Well.—See Bullocks Well.

Koehn Spring.—Three miles north of Cantil. Pages 164, 165; Plate X. On some maps called Cane or Kane Spring. Should not be confused with Kane Spring, about 7 miles south of Newberry Spring. (See above.)

Kramer.—Pages 132, 133, 151, 153; Plate X.

La Motte Spring.—A spring of this name is indicated on the Searles Lake topographic map as in T. 22 S., R. 42 E. Mount Diablo meridian. (See Pl. X.) No definite information is available in regard to it.

Lancaster.—Pages 139, 141, 155, 156, 157, 158; Plate IX.

²⁸ For detailed description of valley see Lee, C. H., Ground-water resources of Indian Wells Valley, Calif.: California Conservation Comm. Rept., 1912, pp. 401-429.

Lanes Well.—Page 190; Plate XI.

Lanfair.—Pages 233, 236, 237, 238; Plate XII.

Langford Well.—Pages 215, 216; Plate XI.

Lavic.—Pages 122, 126, 219; Plate XI.

Layton Spring.—In Layton Canyon, on the west side of the Slate Range, along an old road leading from Searles Lake to the south end of the Panamint Valley. (See Pl. X.) The road is impassable for automobiles, but it is understood that it can be traveled by wagons. The spring is used by prospectors working in the vicinity.

Leach Spring.—Pages 173, 176; Plate XI.

Lead Pipe Spring.—Reported to be in extreme southeastern part of T. 28 S., R. 45 E. Mount Diablo meridian, about 10 miles northeast of Granite Wells. (See Pl. X.) It is reached by a little-used road that turns east from the road between Granite Wells and Lone Willow Spring, about 9 miles north of the former place. No information is available in regard to the condition or persistency of the spring.

Leastalk.—Now called Ivanpah. (See p. 258; Pl. XII.)

Le Conte Spring.—A spring of this name was reported²⁹ to exist on the southeast side of Ord Mountain on an old road from Box S ranch to Newberry Spring. (See Pl. XI.) The writer was informed that no spring exists in the locality shown on the old map. The road is not used.

Lecyr Well.—Pages 234, 236; Plate XII.

Ledge (Maruba post office).—Pages 234, 236; Plate XII.

Leliter.—Page 171; Plate X.

Lewis Holes.—A spring of this name is indicated on the Ivanpah topographic map as on the east side of the Castle Mountains, 12 miles east and a little north of Barnwell. (See Pl. XII.) Nothing is known in regard to it.

Little Lake.—Page 161; Plate X.

Little Morongo Creek.—It is reported that water flows throughout the year in this creek about 3 miles northeast of the Covington ranch (see p. 245, Pl. XI, fig. 5), a short distance north of the point where the stream enters a canyon about half a mile south of the road to Dale.

Little Rock.—Pages 139, 140; Plate X.

Liverpool Landing.—It is reported that a number of Indians are living along Colorado River in the Chemehuevis Valley near Liverpool Landing, 6 miles east and north of West Well (see Pl. XIII), and that water can be obtained from them.

Llano.—Pages 139, 140; Plate X.

Loman ranch.—Pages 122, 126; Plate XI.

Lone Willow Spring.—Pages 183, 184; Plate X.

Los Angeles Aqueduct.—It is reported that water can be obtained at many places along the Los Angeles Aqueduct where it passes through the desert, either at manholes or where faucets have been put in.

Lost Horse Well.—Page 247.

Lovejoy Springs.—Near center of T. 6 N., R. 9 W., about 7 miles almost due north of Llano (see Pl. X), from which place a road leads north past the springs to the eastern part of Antelope Valley. The spring was not visited, but water is obtainable there and at near-by ranches.

Lucerne Valley.—Water is obtainable at a number of homesteads in this valley, 25 miles east of Victorville. (See p. 142 and Pl. XI.)

²⁹ Mendenhall, W. C., Desert watering places in California and Nevada: U. S. Geol. Survey Water-Supply Paper 224, pp. 68-69, 1909.

Ludlow (Stagg post office).—Pages 122, 126, 205, 219, 220; Plate X.

Lugo.—A siding on the Atchison, Topeka & Santa Fe Railway about 5 miles southwest of Hesperia. (See Pl. X.) Barrels are usually kept filled with water at the siding.

Mail Spring.—This spring is shown on the Ivanpah topographic sheet as 2½ miles southwest of Barnwell (see Pl. XII), but nothing is known about it.

Malpais Spring.—This spring is shown on the Ivanpah topographic sheet as about 8 miles northeast of Barnwell (see Pl. XII), but nothing is known about it.

Marl Spring.—Page 231; Plate XII.

Martins Well.—R. A. Martin reports that he has a well in a wash on the west side of the Turtle Mountains, about 10 miles a little north of east of Ward station. (See Pl. XIII.) It is not reached by any road, and the exact location of it is uncertain. The well is only 7 feet deep and contains about 2 feet of water, but it has never been known to go dry.

Maruba post office (Ledge).—Pages 234, 236; Plate XII.

Mascot Spring.—A spring by this name was reported⁸⁰ to exist at the base of the lava flow near the southwest edge of Bristol "Dry Lake," about 4½ miles south of Bagdad. (See Pl. XII.) Mr. A. B. Mulvane, in charge of the gypsum plant of the Consolidated Pacific Cement Plaster Co., at Amboy, states that he has made a careful search for this spring but has not been able to find it. He reports finding an old windlass over what was probably once a well, but no spring.

McClanahan Spring.—This spring is shown on the Ivanpah topographic sheet as near the north end of McCullough Range, about 10 miles southeast of Jean. (See Pl. XII.) No information is available in regard to it.

McCullough Spring.—This spring is shown on the Ivanpah topographic map as on the northeast side of McCullough Range, about 13 miles southeast of Jean, Nev. (See Pl. XII.) Another spring is located about 1½ miles farther southeast. Nothing is known in regard to either of these.

McDonald ranch.—Page 154; Plate X. Should not be confused with the P. E. McDonald ranch mentioned on the same page and shown on the same plate.

McNeal Spring.—A small seepage is reported to exist about 7 miles east of Helen station, an old road leading within 50 yards of the spring. (See Pl. X.) The location of this spring is not accurately known.

Means Well.—Page 146; Plate XI.

Mescal Spring.—Pages 210, 211; Plate XII.

Mesquite Spring.—About 6 miles north and a little west of Twenty-nine Palms, in T. 2 N., R. 9 E. San Bernardino meridian. (See p. 248 and Pl. XI.) Should not be confused with spring of same name 21 miles north of Ludlow. (See below.)

Mesquite Spring.—Near Tonopah & Tidewater Railroad, 21 miles north of Ludlow. (See pp. 219–220 and Pl. XI.) Should not be confused with spring of same name in T. 2 N., R. 9 E. San Bernardino meridian. (See above.)

Mesquite Valley.—A number of wells have been drilled in Mesquite Valley 10 miles west of Goodsprings. (See Pl. XII.) Most of these, however, have no pumping equipment and water can not be obtained from them. It can be obtained at the old Sandy mill, Ripley, and the abandoned town of Platina (see pp. 206, 207), at Bullocks or Knights Well (see p. 251), and at a well about 2 miles north of the northwest edge of Mesquite playa ("dry lake"), formerly known as Cub Lee Spring.

⁸⁰ Mendenhall, W. C., *op. cit.*, p. 69.

- Mexican Spring.**—This spring is shown on the Ivanpah topographic map as 3 miles southeast of Ivanpah. (See Pl. XII.) No information available in regard to it. It should not be confused with Mexican Well, 14 miles west of Nipton (see Pl. XII), nor with another spring of the same name located $7\frac{1}{2}$ miles northwest of Goodsprings. (See below.)
- Mexican Spring.**—A spring of this name is shown on the Goodsprings special topographic map as $7\frac{1}{2}$ miles west of Goodsprings and a little more than 2 miles north of Keystone Spring. (See Pl. XII.) No information is available in regard to it. This should not be confused with Mexican Well, 14 miles west of Nipton, nor with Mexican Spring, 3 miles southeast of Ivanpah. (See above.)
- Mexican Well.**—Pages 210, 211; Plate XII.
- Middle Spring.**—Plate X. (See Argus Range, springs in, p. 249.)
- Miller Well.**—A well known by this name was described by Mendenhall²¹ as being at the southeast end of Danby "Dry Lake." (See Pl. XII.) So far as could be learned this well is now filled up. It is of no importance, as water of better quality can be obtained at Ward.
- Milligan.**—Pages 223, 225, 227; Plate XII.
- Mineral Spring.**—This is shown on the Ivanpah topographic map as on the east side of Ivanpah Mountain, 10 miles northwest of Ivanpah station. (See Pl. XII.) No information is available in regard to it.
- Minneola.**—Pages 121, 127; Plate XI.
- Mohave River.**—Water flows in Mohave River at a number of places. Where the flow is abundant, usually better supplies are available at ranches, and elsewhere the supply is not dependable or the water is of poor quality.
- Mohawk Spring.**—Page 243; Plate XIII.
- Mojave.**—Pages 152, 158, 159, 160, 163, 164, 165, 167; Plate IX.
- Monolith.**—Page 159; Plate IX.
- Moody Spring.**—About 23 miles west and 5 miles north of Victorville, in T. 6 N., R. 8 W. San Bernardino meridian. (See Pl. X.) Water is reported to be obtainable from the spring or from a near-by cattle well.
- Moore.**—A station on the Los Angeles & Salt Lake Railroad between Nipton and Ivanpah. (See Pl. XII.) Water obtainable at houses of the section crew. Can be reached by automobile from Ivanpah. Should not be confused with Moore's ranch, 12 miles west of Lanfair. (See below.)
- Moore's ranch.**—Pages 230, 237, 238; Plate XII.
- Morgan Well.**—This well is shown on a General Land Office plat of a recent survey of T. 5 N., R. 8 E. San Bernardino meridian, near the west border of the township. (See Pl. XI.) A road also is shown as leading from it to Ludlow. No information is available in regard to the well.
- Morongo Creek.**—Page 245; Plate XI, figure 5. Also called Dry Morongo Creek; should not be confused with Big Morongo Creek (see p. 250) or Little Morongo Creek (see p. 259).
- Morrison ranch.**—See China ranch.
- Mound Spring.**—This spring is shown on the San Geronio topographic map as about 10 miles southeast of Old Woman Springs (see Pl. XI), but no information is available in regard to it.
- Mountain Spring.**—A spring of this name on the west side of the Argus Range, in T. 23 S., R. 41 E. Mount Diablo meridian (see Pl. X), is reported to yield water throughout the year. In 1919 it was reported to be easily accessible by automobile. Several other springs are located in the vicinity.
- Mountain Wells.**—About 4 miles east and north from Johannesburg. (See pp. 172, 177; Pl. X.) Water from these wells and Squaw Spring Well is piped to Johannesburg and Randsburg for public supply.

²¹ Mendenhall, W. C., op. cit., p. 76.

Mule Spring.—This spring is reported to have existed in Mule Canyon, in the Alvord Mountains on the old road between Daggett and Bitter Spring. (See Pl. XI.) The road is now impassable, and the spring is said to have been filled in.

Muroc.—Pages 151, 152, 155, 156; Plate X.

Murphy Well (abandoned).—Page 191; Plate X. Should not be confused with a well of the same name 4 miles west of Nipton. (See below.)

Murphy Well.—Pages 210, 232, 234, 236; Plate XII. Should not be confused with an abandoned well of the same name 20 miles northeast of Barstow. (See above.)

Myricks Spring.—Pages 179, 180, 187, 189; Plate XI. This is not a reliable watering place.

Needles.—Pages 123, 124, 240, 243; Plate XIII.

Neenach.—Pages 157, 159; Plate IX.

Newberry Spring (Water post office, formerly Wagner post office).—Pages 121, 127, 218; Plate XI.

New York Mountains, springs and wells in.—A number of unnamed springs occur in the New York Mountains (see Pl. XII), but nothing definite is known in regard to them. It is understood that a number of them went dry in the winter of 1917-18, and they are probably not reliable in unusually dry seasons.

Ninety-nine Spring.—This spring is shown on the Ivanpah topographic sheet in a canyon about 1 mile east of the summit of Potosi Mountain, 10 miles north and a little west of Goodsprings. (See Pl. XII.) No information is at hand in regard to this spring.

Nipton.—Pages 210, 232; Plate XII.

"Oil Well."—About 3 miles north of Hawes. In December, 1917, water of fair quality was obtainable from a well 3 miles north of Hawes (see Pl. X), where another well 2,900 feet deep was being pumped in the expectation of obtaining oil. If this pumping plant is shut down water will not be available at this place.

Old Borax Works.—About 1½ miles southwest of Zabriskie. (See Pl. XI; also Borax works.)

Old Woman Mountains, springs in.—Several unnamed springs are reported to exist in the Old Woman Mountains, southeast of Danby. Two of these, in T. 6 N., R. 17 E. San Bernardino meridian (see Pl. XII), are shown on plats of recent surveys of the General Land Office. One of them, south of Weavers Well, is reached by a road and trail from Danby. (See p. 227.) It is reported that a good flow of water occurs in a canyon on the west side of the mountains that is reached by a road branching from the Danby-Kilbeck road, about 9 miles south of Danby. This may be the same as that shown on some maps as Richmond Spring. Another spring in a branch of Carbonate Gulch has been used for a water supply at the Yellow Metal mining camp. (See p. 222.) (See also Honeymoon Spring, Sunflower Spring, Weavers Well, Wilhelm Camp, and Granite Tank.)

Old Woman Spring.—Page 146; Plate XI. Located 37 miles east and south of Victorville. This name has also been used indefinitely to indicate springs in the Old Woman Mountains (see Pl. XII), but there seems to be no spring in these mountains that is at present known definitely by this name. It is said that Sunflower Spring in the Old Woman Mountains has been known at times as Old Woman Spring.

Orange Blossom mine.—Plate XII. Probably not a watering place unless the mine is being operated. (See p. 221.)

- Ord Spring.**—A spring of this name was reported³² to exist on the west side of Ord Mountain near a road from Daggett to Box S ranch. This road is no longer used, and it is said there is no spring in the locality shown on the older maps. It is possible that this is the spring now known as Sweet-water Spring. (See Pl. XI and p. 218.)
- Oro Grande** (Halleck post office).—Pages 120, 128; Plate X.
- Ott Well.**—About 7 miles north and east of Trona. (See Pl. X.) The water is probably not of good quality.
- Owl Holes or springs.**—Page 203; Plate XI.
- Palliser post office** (Hicks station).—Pages 120, 128; Plate X.
- Palmdale.**—Pages 139, 157, 158; Plate IX.
- Palm Springs station.**—Page 244; figure 5.
- Panamint Range.**—Several springs occur in the high mountains east of Panamint Valley, between Wingate Pass and Ballarat. (See Pl. X.) They are not located on any regularly used routes of travel, and nothing definite is known of them. They are accurately located on the Searles Lake topographic sheet.
- Paradise Springs.**—Pages 192, 195; Plate XI.
- Parker.**—Pages 224, 241; Plate XIII.
- Parker Ferry.**—Pages 224, 241; Plate XIII.
- Peach Spring.**—Plate X. (See Argus Range, springs in, p. 249.)
- Phelan post office.**—Pages 131, 134, 138; Plate X.
- Pine Knot post office.**—Pages 143, 144; Plate XI.
- Pipes, The.**—Page 247; Plate XI. Should not be confused with Pipes Wash Well. (See below.)
- Pipes Wash Well.**—Page 247; Plate XI. Commonly known as "The Windmill." Should not be confused with "The Pipes." (See above.)
- Piute Spring.**—Page 239; Plate XIII.
- Piute station.**—Pages 123, 125; Plate XII.
- Platina.**—Pages 206, 207; Plate XII.
- Potosi Mine Spring.**—On the south side of a canyon at the Potosi mine, in the northeastern part of T. 23 S., R. 57 E. Mount Diablo meridian. (See Pl. XII.) The spring is said to yield about 1 gallon a minute and the water is said to be good.
- Priest Well.**—Probably in sec. 8, T. 2 S., R. 20 E. San Bernardino meridian, about 4 miles southwest of Rice (formerly called Blythe Junction). (See Pl. XIII.) The water is not used for domestic purposes.
- Providence Mountains, springs in.**—Several unnamed springs are indicated on the Ivanpah topographic sheet in the Providence Mountains (see Pl. XII), but no information is available in regard to them.
- Quail Spring.**—Pages 173, 176, 178; Plate XI. On the north side of the Quail Mountains, about 6 miles north and a little west from Leach Spring. Should not be confused with other springs of the same name on the northeast side of the Little San Bernardino Mountains (T. 1 S., R. 7 E. San Bernardino meridian) and in the Castle Mountains. (See below.)
- Quail Spring.**—T. 1 S., R. 7 E., San Bernardino meridian. (See Pl. XI, p. 247.) Should not be confused with Quail Spring in T. 18 N., R. 1 E. San Bernardino meridian. (See above.)
- Quail Spring.**—A spring of this name is indicated on the Ivanpah topographic sheet as on the east side of the Castle Mountains, 11 miles east of Barnwell. (See Pl. XII.) Nothing is known about this spring. It should not be confused with springs of the same name in T. 1 S., R. 7 E. San Bernardino meridian and T. 18 N., R. 1 E. San Bernardino meridian. (See above.)

³² Mendenhall, W. C., op. cit., p. 68.

- Quail Springs.**—Springs of this name were reported³³ to occur about 8 miles east of Searles (Pl. X), but they are not known to exist. They should not be confused with other springs of the same name. (See p. 263.)
- Rabbit Holes.**—A small seepage approximately in the northwestern part of T. 18 N., R. 9 E. San Bernardino meridian, about 22 miles north and a little east of Silver Lake. (See Pl. XI.) It is not on any regular route of travel. The supply of water is not reliable and is usually contaminated by animals.
- Rabbit Springs.**—Pages 143, 150; Plate XI. The water at this place is not easily obtained and better supplies are available at near-by ranches.
- Railroad pumping station.**—Three miles north of Ivanpah. Pages 234, 236; Plate XII.
- Railroad Spring.**—In a canyon on the west side of McCullough Range, 9 miles east of Roach. (See Pl. XII.) It is reported to yield about 1 gallon a minute, the water being of fair quality. So far as is known no road leads to the spring. Another unnamed spring is shown on the Ivanpah topographic sheets 2 miles north of Railroad Spring.
- Randsburg.**—Pages 133, 164, 166, 167, 170, 171, 177, 178; Plate X.
- Rasor.**—Pages 205, 219; Plate XI.
- Red Pass, well at.**—Page 217; Plate XI. Not a reliable watering place.
- Resting Springs.**—Five miles northeast of Tecopa, on a road used by travelers going from that place to Pahrump Valley. (See p. 208 and Pl. XI.) A good supply of water is obtained. A rancher lives at this place.³⁴
- Rhodes Spring.**—Pages 199, 200; Plate XI.
- Ricardo.**—Pages 160, 162; Plate X.
- Rice.**—Pages 223, 225; Plate XIII. Formerly known as Blythe Junction.
- Rich.**—Pages 151, 152; Plate X.
- Richs Well.**—Page 147; Plate XI. (See also Wilburs Well.)
- Riggs.**—Pages 202, 204; Plate XI.
- Riggs Wash, well at head of.**—Pages 206, 207; Plate XII. Should not be confused with Riggs Well, about 8 miles farther west and a little north. (See below.)
- Riggs Well.**—On the south side of the Silurian Mountains, 3 miles east of Riggs station on the Tonopah & Tidewater Railroad. (See Pl. XI.) The well was reported in July, 1919, to contain a good supply of water. Should not be confused with a well at the head of Riggs Wash, about 8 miles farther east and south. (See above.)
- Ripley.**—Pages 206, 207; Plate XII.
- Roach.**—Page 235; Plate XII.
- Rock Corral.**—Page 146; Plate XI.
- Rock Springs.**—Pages 237, 238; Plate XII.
- Rosalie.**—This name was formerly applied to Valley Wells. (See Pl. XII.)
- Rosamond.**—Page 158; Plate IX.
- Roseberry Spring.**—Pages 210, 211; Plate XII. Not a reliable spring.
- Sablon.**—Pages 223, 225; Plate XIII.
- Saddlerock Spring.**—This spring is shown on the San Gorgonio topographic map as 5 miles almost due south of Rock Corral (see Pl. XI), but no information is available in regard to it.
- Salsberry Spring.**—Pages 199, 200; Plate XI.
- Saltdale.**—Pages 164, 165; Plate X.

³³ Mendenhall, W. C., op. cit., p. 43.

³⁴ Not visited, but reported to the writer by G. R. Mansfield, U. S. Geological Survey.

- Salt Spring.**—In the bed of the south branch of Amargosa River about 21 miles northwest of Silver Lake, a short distance north of the road from that place to Saratoga Springs. (See Pl. XI.) The water rises to the surface east of a pass through low hills. The water is too salty to be used for drinking. Other salt springs are located in the bed of the Amargosa about 6 miles northwest of Saratoga Springs. (See Valley Springs.) This should not be confused with Salt Well, 26 miles north of Randsburg.
- Salt Well.**—Pages 168, 169; Plate X. Should not be confused with Salt Springs, in south Death Valley.
- San Bernardino.**—Page 118, 130, 131, 134, 138; Plate X.
- San Bernardino Mountains, springs in.**—A number of springs exist in various parts of the San Bernardino Mountains, but practically none of these are listed except a few at the northeast end of the mountains south of Old Woman Springs and Rock Corral (see Pl. XI), where the country is less rugged than it is farther west.
- Sands.**—A station on the Los Angeles & Salt Lake Railroad, in T. 11 N., R. 10 E. San Bernardino meridian (see Pl. XII), not reached by any regularly traveled road. Water obtainable at a railroad pumping plant.
- Sandy Mill.**—Pages 206, 207; Plate XII.
- Saratoga Springs.**—Pages 197, 201, 202, 204; Plate XI.
- Searles Spring.**—Plate X. (See Argus Range, springs in, p. 249.)
- Searles station.**—Pages 167, 170, 171; Plate X.
- Sheep Creek.**—Pages 202, 204; Plate XI.
- Shoshone.**—Pages 199, 200; Plate XI.
- Siam.**—Pages 123, 125; Plate XII.
- Siberia.**—Page 122; Plate XII.
- Sidewinder Well.**—Pages 148, 149; Plate X.
- Silver Lake.**—Pages 174, 175, 178, 180, 194, 202, 205, 208, 209, 211, 212, 215; Plate XI.
- Slaughterhouse Spring.**—About 2½ miles southeast of Ivanpah. (See Pl. XII.) The water is piped to a trough and flows continually. Said to be easily accessible from the road leading between Barnwell and Ivanpah. Reported to yield 75 barrels a day.
- Sloan.**—A station on the Los Angeles & Salt Lake Railroad 14 miles northeast of Jean. (See Pl. XII.) Water probably can be obtained at a railroad water tank.
- Slocum Well (abandoned).**—Page 191; Plate X.
- Soda station (or Soda Lake).**—Pages 205, 220; Plate XI. It was stated by Mendenhall³⁵ that wells exist at different places on the west, south, and east sides of Soda Lake, but nothing was learned in regard to any of them except wells at Soda station, which were not mentioned by him. With the advent of automobiles and the practically complete abandonment of roads near Soda Lake the wells mentioned by Mendenhall have probably become filled up.
- Sperry.**—A station on the Tonopah & Tidewater Railroad 29 miles north of Silver Lake. (See Pl. XI.) Water can be obtained at the houses of the section crew. A road leads past this place from Saratoga Springs and Silver Lake to Tecopa, but it is impassable for most of the distance. (See p. 196.)
- Squaw Tit, well near.**—A well is shown on the Ivanpah topographic map about 1½ miles almost due north of a prominent knob known as Squaw Tit, in T. 15 N., R. 11 E. San Bernardino meridian. (See Pl. XII.) The writer was unable to find this well. Near the point where a road is indicated

³⁵ Mendenhall, W. C., op. cit., pp. 62, 63.

- Valley Wells, well 2 miles south of.**—A well owned by S. E. Yates is about 2 miles south of Valley Wells and half a mile west of the road from that point to Cima. (See Pl. XII.) The well yields about 6 gallons a minute. It is used for watering cattle.
- Valyermo post office.**—Water is obtainable at this place and at several near-by ranches 3 or 4 miles southwest of Llano. (See pp. 139 140; Pl. X.)
- Van Winkle Spring.**—Pages 221, 228; Plate XII.
- Verdemont.**—Pages 118, 129; Plate X.
- Victorville.**—Pages 120, 128, 135, 138, 140, 141, 142, 145, 147, 149; Plate X.
- Vidal.**—Pages 223, 225; Plate XIII.
- Viscera Spring.**—This spring is shown on the San Gorgonio topographic map 9 miles south and a little east of Old Woman Spring (see Pl. XI), but no information is available in regard to it.
- Vontrigger Spring.**—Pages 233, 236; Plate XII.
- Wagner post office (Newberry Spring).**—Pages 121, 127, 218; Plate XI. The name of this place has been changed to Water post office.
- Ward.**—Pages 223, 225; Plate XII.
- Warrens Well.**—Pages 245, 246; Plate XI. Should not be confused with the Covington ranch, several miles farther southeast, which is sometimes also known as Warrens ranch.
- Warrens Tanks.**—Page 245; Plate XI.
- Water post office (Newberry Spring).**—Pages 121, 127, 218; Plate XI. (Formerly called Wagner post office.)
- Weavers Well.**—Page 228; Plate XII.
- Welch Well.**—Pages 240, 242; Plate XIII.
- Westend.**—Pages 163, 168, 169; Plate X. This place was formerly called Hanksite.
- West Well.**—Pages 240, 242; Plate XIII. In Water-Supply Paper 224 two wells were mentioned as West Well and Old West Well. The West Well of that report is the one now called Hanks Well, which is dry, and the Old West Well is the one now commonly known simply as West Well.
- Wheaton Spring.**—Pages 210, 211; Plate XII.
- Whipple Mountains.**—Several springs and natural tanks in the Whipple Mountains are indicated on the Parker topographic map (see Pl. XIII), but no information is available in regard to them.
- Whipple Well.**—This well is indicated on the Parker topographic map as on the north side of the Whipple Mountains. (See Pl. XIII.) No definite information is available regarding it.
- White Rock Spring.**—About 3 miles northwest of Cima, from which it may be reached by automobile. (See Pl. XII.) The spring is on the left side of the road among large granite boulders. A concrete water trough for cattle stands near the road. The quality of the water is only fair. Yields about 40 barrels a day.
- White's ranch.**—Pages 233, 236; Plate XII.
- Whitewater.**—Page 244; figure 5.
- Wilburs Well.**—This well is shown on a map of San Bernardino County published in 1911 as near the center of T. 3 N., R. 5 E. San Bernardino meridian. (See Pl. XI.) No information could be obtained as to the existence of this well. It may be the same as Richs Well.
- Wild station.**—Pages 120, 128; Plate X. Formerly known as Cottonwood.
- Wilhelm Camp.**—Page 227; Plate XII.
- Williams Well.**—At Baker station, on the Tonopah & Tidewater Railroad. (See p. 205, Pl. XI.) Should not be confused with Williams Well in T. 32 S., R. 47 E. Mount Diablo meridian. (See p. 269.)

- Williams Well.**—About 18 miles north of Barstow. (See pp. 190, 191; Pl. XI.) Should not be confused with a well of the same name at Baker station on the Tonopah & Tidewater Railroad. (See p. 268.)
- Willis Well.**—Page 218; Plate XI. This is probably the same place that is referred to on old maps as Willow Spring, on the east side of Ord Mountain.
- Willow Creek.**—About 4 miles southeast of Tecopa. (See p. 208; Pl. XI.) Several springs are reported to exist in the canyon along this creek.
- Willow Spring.**—A spring of this name is shown on old maps as being on the east side of Ord Mountain. (See Pl. XI.) It is reported that there is no such spring, but that the name is due to a confusion with Willis Well, at about the same point. (See p. 218.) Should not be confused with other springs of the same or similar names—one, a well-known watering place 14 miles southwest of Mojave (see above), another in the Old Dad Mountains (see Pl. XII), a third east of Ivanpah, a fourth 8 miles north of Randsburg (see below), and Lone Willow Spring, in the Slate Range (see p. 259).
- Willow Spring.**—About 8 miles north of Randsburg. (See Pl. X.) Water was reported to be obtainable in August, 1919.
- Willow Spring.**—In Old Dad Mountains. (See p. 221; Pl. XII.) Should not be confused with a spring shown on some maps on the east side of Ord Mountain. (See above.)
- Willow Spring.**—A spring of this name is shown on the Ivanpah topographic map as 5 miles east of Ivanpah. (See Pl. XII.) A pipe line formerly led from the spring to a mill at the abandoned settlement of Vanderbilt, but this pipe line was taken up in 1917. It should not be confused with other springs of the same name. (See above.)
- Willow Springs.**—About 14 miles southwest of Mojave. (See p. 159; Pl. IX.) Should not be confused with other springs of the same name. (See above.)
- Wilsona post office.**—Water is obtainable at the ranch known as Wilsona post office, about 25 miles southeast of Lancaster. (See Pl. X and p. 141.)
- Windmill, The.**—Page 247; Plate XI. This is also known as Pipes Wash Well. Should not be confused with "The Pipes."
- Yeoman Spring.**—This spring is 5 miles northeast of Zabriskie, in T. 21 N., R. 7 E. San Bernardino meridian. (See Pl. XI.) It yields a good flow of water that is warm but has been used for domestic purposes.
- Yermo.**—Pages 214, 216; Plate XI.
- Zabriskie.**—Pages 199, 200; Plate XI.

