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Churchill County
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UNITED STATES
DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, SECRETARY

BUREAU OF MINES
JOHN W. FINCH, DIRECTOR

INFORMATION CIRCULAR

RECONNAISSANCE OF MINING DISTRICTS IN
CHURCHILL COUNTY, NEV.



BY

WILLIAM O. VANDERBURG

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By William O. Vanderburg^{2/}

CONTENTS

Page

Introduction.....	3
Acknowledgments.....	4
Churchill County.....	4
Political history.....	4
Topography.....	5
Water resources.....	6
Climate and vegetation.....	6
Power facilities.....	7
Transportation facilities.....	7
History of mining.....	8
Mineral production.....	10
① Alpine district.....	15
Nevada gold group.....	15
② Bernice district.....	16
Silver deposits.....	16
Antimony deposits.....	16
③ Chalk Mountain district.....	17
Chalk Mountain Silver Lead Mines Co.....	18
⑤ Desert district.....	19
Manitou Gold Mining Co.....	19
⑥ Eastgate district.....	20
Gold Ledge group.....	20
Buffalo Hump group.....	21
Building stone.....	23
⑦ Fairview district.....	23
Nevada Range Mines Co., Inc.....	24
Gold Basin Mining Co.....	28
Belle Mountain Mining Co.....	28
Shamrock group.....	28
Westgate custom mill.....	29
Manganese deposit.....	29
⑪ Fireball district. (Truckee).....	30

Mining Dist.

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CONTENTS - Continued

	<u>Page</u>
⑧ Holy Cross district.....	30
Terrell group.....	30
Cinnabar Hill group.....	31
Bimetal group.....	32
Diatomaceous earth deposit.....	32
⑨ I. X. L. district.....	32
Black Prince group.....	33
Bonanza group.....	34
Gold Bar group.....	34
Revenue group.....	35
⑩ Jessup district.....	35
Valley King group.....	36
Diatomaceous earth.....	36
⑪ Lake district.....	36
Limestone deposit.....	37
White Plains salt deposit.....	37
Sodium nitrate deposit.....	37
⑫ La Plata district.....	38
La Plata mine.....	39
Michigan claim.....	39
Leete district.....	39
⑬ Sand Springs district.....	40
Dan Tucker mine.....	40
Salt deposits.....	41
Borax deposits.....	42
⑭ Shady Run district.....	43
Soda Lakes district.....	43
⑮ Table Mountain district.....	45
Nickel-cobalt deposits.....	45
Copper deposits.....	47
Dixie Comstock mine.....	48
Kaolin deposit.....	48
Dixie Marsh.....	49
Other Mines and prospects.....	50
⑯ Toy district.....	51
Toy mine.....	51
Hardscrabble claim.....	52
⑰ White Cloud district.....	52
Nevada United Mining Co.....	53
⑱ Wonder district.....	54
Nevada Wonder mine.....	54

ILLUSTRATION .

Following Page

Fig. 1. Sketch map of Churchill County, Nev....

4

TABLES

<u>No.</u>		<u>Page</u>
1	Net annual production of gold and silver from Churchill County, 1885-1903.....	11
2	Gold, silver, copper, and lead production in Churchill County, Nevada, 1904-37, in terms of recovered metal....	12
3	Gold, silver, copper, and lead production from Fairview district, Nevada, 1906-37, in terms of recovered metal..	25
4	Gold, silver, copper, and lead production from Wonder District, Nevada, 1907-37, in terms of recovered metal.....	55

INTRODUCTION

This report^{3/} gives the results of a reconnaissance of the mining districts in Churchill County, Nev., made in the fall of 1938 and spring of 1939. All of the mining districts in the county were visited, but no attempt has been made to include all the mines and prospects within the area; inclusion or omission of a property in this paper has no bearing on its merits. The report gives the situation of the various districts, mineral production, and ownership of properties; describes the ore deposits, mines, and prospects; contains information on past and current activity; and includes other data likely to be useful to those interested in the development of our mineral resources.

The various districts were named when they were organized for purposes of record and regulation. When established, the districts embraced large areas without well-defined borders, so that the names have little geographical significance.

As a result of the mining activity in the Comstock and Reese River districts in Nevada, considerable prospecting in Churchill County took place in the sixties and seventies. A number of districts were organized, but no outstanding metal discoveries were made until 1905 and 1906, when rich silver-gold deposits at Fairview and Wonder were found. The Nevada Wonder mine in the Wonder district and the Nevada Hills mine in the Fairview district have been the principal producers in the county. With exhaustion of ores in these two properties about 1920, mining activity declined. Current mining activity consists largely of the operations of lessees; the ores produced are shipped either to smelters in Salt Lake Valley, Utah, and McGill, Nev., or to a local custom milling plant recently erected at Westgate in the southeastern part of the county.

In the industrial mineral group, salt for metallurgical use was an important commodity produced from the salines in Churchill County in the past. Sodium carbonate and borax also were produced in commercial quantities in former years.

^{3/} Manuscript completed May 25, 1939.

ACKNOWLEDGMENTS

The author wishes to thank the owners, lessees, and mine operators, too numerous to mention individually, who furnished aid and information during the course of the field work. Special thanks are due John T. Reid, Lovelock, Nev., who kindly furnished data of historical nature on the old mining districts in the Stillwater Range.

B. F. Couch, secretary of the Nevada State Bureau of Mines, Reno, Nev., made available published data pertaining to former mining activities within the county; credit for such data as were used is given in the text. Charles White Merrill, of the Mineral Production and Economics Division, Bureau of Mines, compiled the figures for the mineral-production tables for the Wonder and the Fairview districts, and for Churchill County.

CHURCHILL COUNTY

Political History

The region within the present boundaries of Nevada originally comprised part of the territory acquired by the United States from Mexico under the treaty of Guadalupe Hidalgo signed in 1848. After its acquisition by the United States, it constituted the western part of the Territory of Utah, from which it was separated by an Act of Congress approved March 2, 1861, to form the Territory of Nevada. The territorial status was maintained until October 31, 1864, when, by proclamation of President Lincoln, it was admitted into the Union as the thirty-sixth State.

Churchill County is one of the nine original counties created by Territorial Act approved November 25, 1861. As created, the county was considerably larger; its size was reduced by cessions of land to Lander County on December 12, 1862; to Lyon County, February 20, 1864; and to Nye County, March 5, 1869. In February 1869 a small triangular tract was withdrawn from Humboldt County and ceded to Churchill County, making the boundaries as shown in figure 1.

When Churchill County was created, it was officially attached to Lyon County for judicial and revenue purposes, and a joint county seat was established at Buckland Station (later Fort Churchill). On February 20, 1864, Churchill County was separated from Lyon County, and in April of the same year La Plata, on the east side of the Stillwater Range, was designated the county seat. In 1868 the county seat was moved to Stillwater, on the west side of the range 18 miles west of La Plata, where it remained until 1908, when it was moved to Fallon.

Churchill County derives its name from Fort Churchill, United States military post from 1860 to 1870, situated in Lyon County west of the present county line. It has an area of 5,091 square miles and a population of 5,075, according to the census of 1930. Most of the population resides in Fallon, the county seat and supply center for the ranches and mining districts within a radius of many miles.

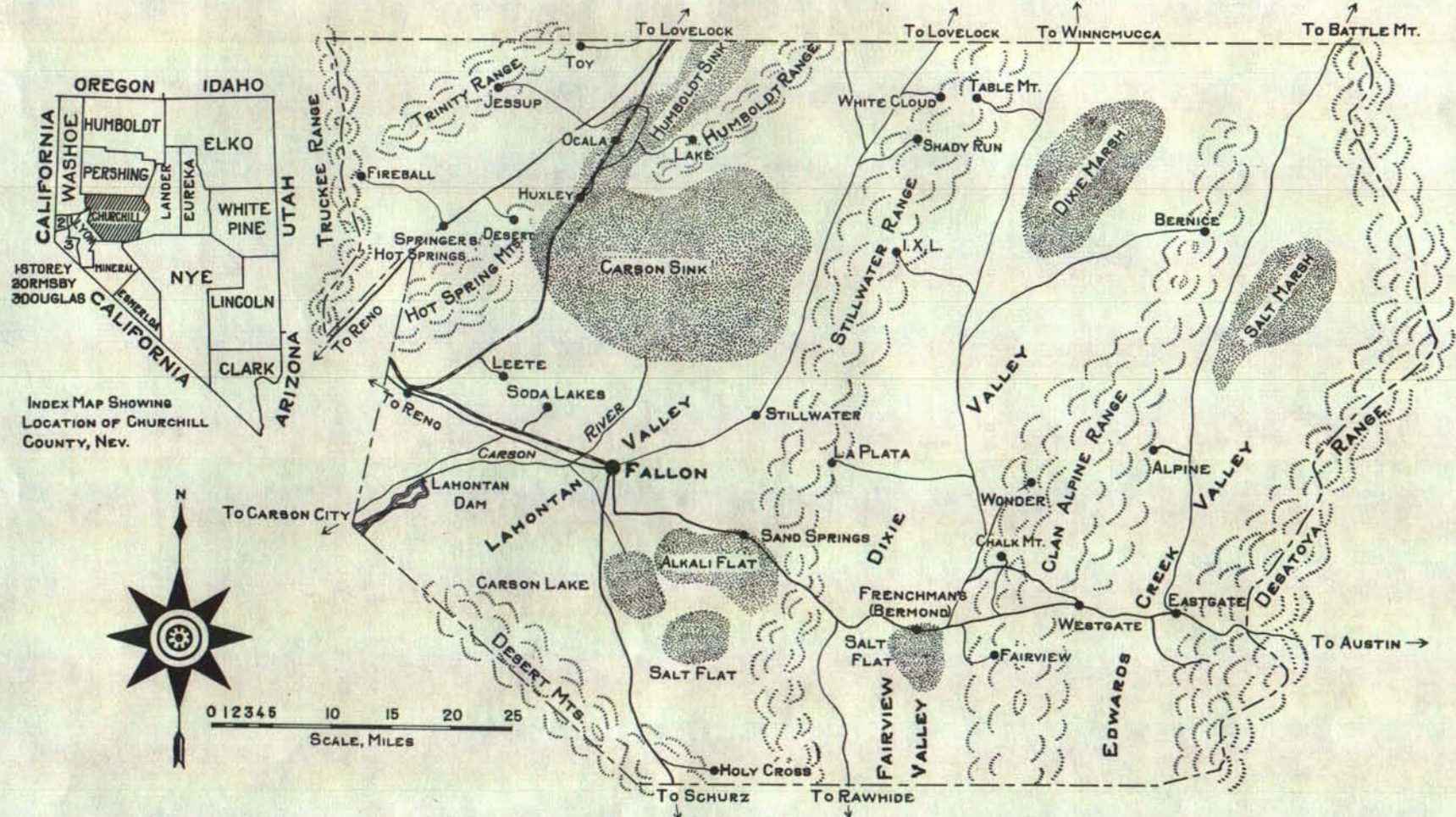


FIGURE 1.—SKETCH MAP OF CHURCHILL COUNTY, NEV.

The assessed value of real property in the county for the fiscal year ended June 30, 1938, was \$8,108,312, and the county tax rate for the same period was \$2.74 per \$100, exclusive of special taxes, but including the State tax of \$0.73 per \$100 valuation.^{4/}

Topography

Nevada is in the Great Basin and lies between the Sierra Nevadas on the west and the Wasatch Range on the east. The northern part of the Great Basin, in which Churchill County is situated, has a general altitude of about 4,000 feet and is traversed by long, narrow mountain ranges having a general north-south trend. The mountain ranges are separated by valleys ranging from 5 to 20 miles in width.

The Great Basin is an area of interior drainage; one of its peculiar topographical features is the number of playa lakes that occupy the lowest portions of the valleys. Churchill County contains a greater number of such lakes in proportion to its size than any other county in the State. They comprise the Humboldt Sink which receives the drainage of the Humboldt River from the east; the Carson Sink, which is the natural drainage basin for the Carson River flowing from the west; and the Dixie Sand Springs and Edwards Creek salt marshes, which drain valleys of the same names. During periods of precipitation they are covered with shallow sheets of water which may extend for many square miles, but during the summer months they evaporate to dryness, their beds becoming level mud plains so compact and hard that the imprints of passing automobiles are barely discernible. The beds consist of a mixture of alkali salts, clay, and silt. The salts generally present are sodium chloride, sodium carbonate, sodium bicarbonate, and sulfate of soda, with occasional small amounts of potassium chloride and borates. In the early days of silver milling by the Washoe and Reese River processes, the playa lakes were of considerable economic importance as a source of salt for chloridizing silver ores. The playas were also important as a source of borates in former years.

The principal mountain ranges in Churchill County, from east to west, are the Desatoya Range on the border between Churchill and Lander Counties, Clan Alpine Range, Stillwater Range, and Hot Springs Range. Other minor ranges are in the western part of the county. The higher ranges generally are rugged and form serrated crests having an altitude of 1,000 to 5,500 feet above the subjacent valley plains. The alternate arrangement of valleys and mountain ranges is the result of orographic displacement, the uplifted portions of the fault blocks appearing as long, narrow ranges.

The principal valleys in the county, from east to west, are Edwards Creek, Fairview, Dixie, and Lahontan. Dixie Valley, lying between the Stillwater and Clan Alpine Ranges, is unusual in that the floor of the valley is nearly 500 feet lower than that of the other valleys in the county.

^{4/} Wickland, Belle, Auditor of the County of Churchill, 22d Annual Report for the Fiscal Year July 1, 1937, to June 30, 1938.

Water Resources

Two of the largest rivers in Nevada normally discharge into sinks within the borders of Churchill County. The Humboldt River, with its tributaries, constitutes the largest stream system in the State; it rises in the northeastern corner of Nevada and, after flowing in a general west-southwest direction for at least 400 miles, finally empties into Humboldt Sink, part of which is in northern Churchill County. In 1935 the Federal Government constructed the Rye Patch Dam northwest of Lovelock to impound the waters of the Humboldt River; the entire flow is used for irrigation in the valley south of Lovelock, so that no waters reach Humboldt Sink.

The Carson River rises on the eastern slope of the Sierra Nevadas in California and flows northerly and easterly, entering Nevada as two separate streams known as East Fork and West Fork, which unite a few miles from the State line to form the main river. The Carson River normally empties into Carson Sink, but its waters are impounded in Lahontan Reservoir, which supplies the Newlands reclamation project, the first Federal irrigation project in the west. The water is used to generate hydroelectric power and irrigate farm lands in the vicinity of Fallon.

The Stillwater and Alpine Ranges are traversed by V-shaped canyons in which flow small mountain streams, several of which are perennial. Artesian water is present in Dixie and Edwards Creek Valleys. Hot springs occur in Dixie Valley on the west side of Dixie Salt Marsh and at Hot Springs station on the west side of Hot Springs Mountains.

The valleys between the mountain ranges are the natural underground drainage receptacles for the run-off, so that, if not otherwise available, water for mining and milling purposes can be developed by sinking wells, usually within convenient distance of most of the districts mentioned in this report.

Climate and Vegetation

The amount of precipitation in Churchill County varies progressively with the altitude, the mountains receiving the most and the valleys the least. Data compiled by the Nevada Agricultural Experiment Station indicate that approximately 46 percent of the area has an annual precipitation of 0 to 5 inches, 27 percent, 5 to 8 inches; 24 percent, 8 to 15 inches; and the remaining 3 percent, comprising the higher mountain ranges in the eastern part of the county, 15 to 20 inches. The precipitation is largely in the form of snow. With the exception of some of the more isolated areas within the county that may be snowed in for brief periods, all parts of the county are accessible the year around.

The climate is moderate and healthful and marked especially during the summer months by a large diurnal range in temperature, warm days being followed by cool nights. During the summer the days are warm, and there is an abundance of sunshine. The seasons are not distinct, and the transition

from one to the other is almost imperceptible. In the spring and fall, winds rise with considerable regularity each day and form whirlwinds, which, on the dry lakes, whirl clouds of sand and alkali dust high into the air, often to a height of 1,000 feet.

Sagebrush, which grows throughout the county except on the higher mountain slopes above a general altitude of 6,500 feet is the dominant plant growth in the county. The saline marshes are sterile except for sparse growth of salt-loving plants, such as salt grass and tule, along their borders. The sagebrush lands are generally arable as they contain all the minerals necessary for raising crops adapted to the temperate zone. The larger portion of such land however, is unproductive, as rainfall is insufficient to support cultivated crops. Where water for irrigation is available, good crops are raised. The fertility of the soil is indicated by the size and thriftiness of the sagebrush, high growths indicating a rich soil containing more than the ordinary amount of moisture. The tenumbi bush (so-called by the Indians) is abundant in Dixie Valley and appears to be associated with shallow ground water, to which the roots penetrate to obtain moisture.

On the mountains above an altitude of about 7,000 feet the greater precipitation favors sparse growths, such as dwarfed juniper (*Juniper occidentalis*), mountain mahogany (*Cercocarpus laediflorus*), and piñon pine (*Pinus monophylla*) being the most common. The forest growths are suitable only for firewood.

White sage, bunch grass, and other varieties of nutritious grasses furnish forage for cattle and sheep.

Power Facilities

The only public service power company operating in Churchill County is in the Truckee-Carson irrigation district, which serves Wadsworth and Nixon in Washoe County, Fernley and Fallon in Churchill County, and the surrounding rural populations from the Lahontan hydroelectric plant 17 miles west of Fallon. The plant has a capacity of 1,500 kilowatts supplied by three hydroelectric generators; the current is distributed through 283 miles of transmission and distribution lines at 33,000, 11,950, and 6,900 volts. None of the mining districts mentioned in this report is served by the district. Power for mining and milling is supplied by internal-combustion engines.

Transportation Facilities

The main line of the Southern Pacific R. R. traverses the northeast portion of Churchill County, and a branch line 16 miles in length connects Hazen on the main line with Fallon, the county seat.

The freight rates on ore and concentrates per ton from Fallon, the principal shipping point within the county, to Utah smelters are as follows:^{5/}

Value per ton	\$15	\$20	\$30	\$40	\$50	\$60	\$70
40-ton minimum	3.30	3.30	4.00	4.70	5.40	6.10	6.80
20-ton minimum	5.20	6.00	6.50	7.00	7.70	8.20	8.70
Value per ton	\$80	\$90	\$100	\$150	\$200	\$250	\$300
40-ton minimum	7.50	8.20	8.90	-	-	-	-
20-ton minimum	9.20	9.70	10.20	11.50	12.20	14.30	14.30

Fallon is also on U. S. Route 50, (Lincoln Highway) which passes through the county in a northwest-southeast direction. U. S. Route 40 (Victor Highway) cuts across the northwestern part of the county. Both of these roads are hard-surfaced. Unimproved branch roads connect with the main highways at various points, so that virtually all of the districts mentioned in this report are accessible by automobile.

History of Mining

Churchill County was inhabited by Indians long before the appearance of the white men, but there is virtually no evidence to indicate that the aborigines were versed in the art of mining. Vestiges of prehistoric Indian occupation are found in the form of petroglyphs chiseled in caves and on ledges in several localities and in articles of Indian workmanship found in several caves in the northern part of the county. The mysterious petroglyphs were chiseled by people who have left no decipherable records of their origin or state of civilization. Some of these rock inscriptions are found west of the Fallon Schurz highway, 12 miles southwest of Fallon, along terraces left by the receding water of ancient Lake Lahontan, which at one time covered an area of about 8,000 square miles.

In the northern part of Churchill County are several limestone caves that were used as dwellings by Indians. The largest of these caves, situated 22 miles southwest of Lovelock, was located as a mining claim in 1911 by James H. Hart and David Pugh, of Lovelock, Nev., for the bat guano found therein. During the removal of about 250 tons of guano for fertilizer, numerous Indian artifacts were found, and subsequently the cave was explored by archeologists. Harrington^{6/} states it is probable that articles found in the debris range in age from 1,000 B. C. to recent time. It is interesting to note that of about 10,000 specimens of ancient Indian civilization unearthed in the cave, no metals were found.

The mining history of Nevada can be divided into two periods of extraordinary activity. The first began in the sixties with the discovery of the

^{5/} Since the foregoing table was prepared, there has been an increase in freight rates and 10 percent of the foregoing rates must be added.

^{6/} Land, Llewellyn L., and Harrington, M. R., Lovelock Cave: University of California Publication in American Archeology and Ethnology, Vol. 25, No. 1, University of California Press, Berkeley, California, 1929, pp. 119-120.

Comstock lode and continued until about 1885; the second period began with the discovery of Tonopah at the beginning of this century and continued for about 3 decades.

Although Churchill County was traversed by the two main pioneer overland travel routes across the State taken by emigrants to California in the gold rush of '49 and the years following, no metal was discovered until the early sixties. Humboldt and Carson Sinks, in the western part of the county, known to the pioneers as the Forty-Mile Desert, constituted one of the most formidable barriers to early-day travel, and the country appeared so forbidding that there was little to induce them to tarry or to invite their return.

The first recorded mineral discovery in the county was made by Asa L. Kenyon in 1855, when soda was found in the Soda Lakes near Ragtown. Kenyon, the first settler in the county, established a trading post at Ragtown in 1854. Ragtown (afterward called Leeteville) is one of the historical sites in Nevada, since it was here that the emigrants recruited their stocks and rested after crossing Humboldt and Carson Sinks. It was a station on both the Humboldt River route and the Simpson route; the latter route, laid out by Capt. (later Col.) J. H. Simpson for the United States Government in 1859, was used by the pony express and later by the Overland Mail & Stage Co., and was the principal line of travel across the State until the completion of the Central Pacific R. R. (now Southern Pacific R. R.) in 1869. This route went by way of La Plata, New Pass, Jacobsville, and a point near Austin, coming within a few miles of the two most important mineral discoveries in Churchill County - Fairview and Wonder; but, notwithstanding this fact, the mining camps at these places were not established until nearly half a century later. Although Churchill County was overrun by prospectors in the sixties, no important mineral discoveries were made until many years later.

The status of the metal-mining industry in Churchill County in the late sixties is given in the following extract from a Government report by Browne and Taylor.¹

In Churchill County there are three districts that have attracted some notice, because of the supposed valuable ledges they contained. These are severally named the Silver Hill, the Mountain Well (La Plata), and the Clan Alpine, and to them most of the work performed in the county has been confined. There are in this county four quartz mills carrying 55 stamps, and having driving power equal to that of 165 horses. The total cost of these mills was \$395,000. Three of them are at Mountain Well, and one not quite finished in the Clan Alpine district. They have produced but a few thousand dollars' worth of bullion all told, none of them having been able to run for more than a few days at a time, from an insufficient supply of pay ore, but few of the ledges here having been opened up to even the superficial depths common to most other districts. In the higher strata of some of them small

¹ Browne, J. Ross, and Taylor, James W., Reports Upon the Mineral Resources of the United States: Gov. Printing Office, 1867, p. 128.

aggregations of very rich ores have been found, and the chances favor the supposition that when properly developed they will afford enough ore to keep the present and perhaps additional mills running. Very few additional mills, however, can be operated in the western half of the county, owing to the limited supply of wood and water.

The production of salt from the dry lakes in Churchill County attained considerable importance in the sixties and seventies. The salt was largely used in reducing silver ores on the Comstock and other silver camps in the northern part of the State.

With the discovery of Tonopah in Nye and Esmeralda Counties in 1901 a revival of mining took place. All parts of the State were overrun by prospectors; and, as a result, a number of gold and silver deposits were found and new camps established. Churchill County was not overlooked, and during this period the deposits at Fairview (1905), Wonder (1906), and several others of less importance were found and worked. During this period speculation in mining was prevalent, and an abundance of money was available for mining ventures; miners obtained valuable leases and money for equipment and development with little difficulty; claim owners were able to sell their holdings for cash with few or no showings. One of the striking developments in mining activity during the period was the widespread application of the leasing system whereby a claim or portion of a claim is worked upon payment of a royalty or certain percentage of the value of the ore produced. To the leasing system may be attributed the discovery of many camps in the State, including Fairview and Wonder.

After 1920, with exhaustion of the ore reserves at Wonder and Fairview, mining declined, so that for a number of years the only activity has been a small amount of desultory leasing operations or small company operations, the latter generally short-lived.

In the first part of 1939 the writer estimated that 50 men, mostly lessees, were employed directly in the mining industry in Churchill County.

Mineral Production

Statistics on mineral production of Churchill County before 1903 are incomplete. The net annual production of gold and silver from 1885 to 1903, as compiled from the reports of Churchill County assessors, is shown in table 1.^{g/} The figures in the table are based on the value of the ore after mining and milling expenses were deducted. The gross production for the period stated is estimated to have been about \$250,000. From fragmentary data, the production of metals before 1885 is estimated to have been an additional \$50,000, making a total of \$300,000 up to 1903. This production was derived from a number of small properties in widely scattered districts.

^{g/} Stewart, E. E., Nevada's Mineral Resources: State Printing Office, Carson City, Nev., 1909, p. 110.

With the discovery of the camps of Fairview and Wonder in 1905 and 1906, respectively, metal production increased considerably. From 1904 to 1937 the metal mined, chiefly silver and gold, had a total value of \$10,330,698, as shown in table 2.

TABLE 1.- Net annual production of gold and silver from Churchill County, 1885-1903
(Compiled from quarterly assessment rolls of the county assessors)

Year	Gold and Silver	
	Tons	Values
1885	1,521	\$57,380
1886		
1887	243	14,096
1888		
1889	200	12,000

Year	Value of gold	Value of silver	Total value
1890	\$ 4,000	\$ 6,000	10,000
1891	3,000	5,000	8,000
1892	2,000	2,000	4,000
1893	2,000	2,000	4,000
1894	(1/)		
1895	2,000	5,000	7,000
1896	2,500	4,500	7,000
1897	1,500	4,000	5,500
1898	1,500	4,000	5,500
1899	1,800	4,500	6,300
1900	(1/)		
1901	2,000	3,000	5,000
1902	5,000	8,000	13,000
1903	5,000	8,145	13,145
Total	32,300	56,145	171,921

1/ No figures given.

TABLE 2.- Gold, silver, copper, and lead production in Churchill County, Nev., 1904-37, in terms of recovered metal
(Compiled by Charles White Merrill, Mineral Production and Economics Division, Bureau of Mines)

Year	No. of mines	Placer				Total Value
		Gold		Silver		
		Fine ounces	Value	Fine ounces	Value	
1904.....	-	-	-	-	-	-
1905-06....	-	-	-	-	-	-
1907.....	1	-	-	-	-	-
1908.....	-	-	-	-	-	-
1909.....	-	-	-	-	-	-
1910.....	-	-	-	-	-	-
1911.....	-	-	-	-	-	-
1912.....	-	-	-	-	-	-
1913.....	-	-	-	-	-	-
1914.....	-	-	-	-	-	-
1915.....	-	-	-	-	-	-
1916.....	-	-	-	-	-	-
1917.....	-	-	-	-	-	-
1918.....	-	-	-	-	-	-
1919.....	-	-	-	-	-	-
1920.....	-	-	-	-	-	-
1921.....	-	-	-	-	-	-
1922.....	-	-	-	-	-	-
1923.....	-	12.24	\$253	3	\$2	255
1924.....	-	-	-	-	-	-
1925.....	-	-	-	-	-	-
1926.....	-	-	-	-	-	-
1927.....	-	-	-	-	-	-
1928.....	-	-	-	-	-	-
1929.....	-	-	-	-	-	-
1930.....	-	-	-	-	-	-
1931.....	-	-	-	-	-	-
1932.....	-	-	-	-	-	-
1933.....	-	-	-	-	-	-
1934.....	-	-	-	-	-	-
1935.....	-	-	-	-	-	-
1936.....	-	-	-	-	-	-
1937.....	-	-	-	-	-	-
Total.....	1	12.24	\$253	3	\$2	255

TABLE 2.- Gold, silver, copper, and lead production in Churchill County, Nev., 1904-37, in terms of recovered metal (cont'd.)
(Compiled by Charles White Merrill, Mineral Production and Economics Division, Bureau of Mines)

Year	Lode							
	No. of mines	Ore	Gold		Silver		Copper	
		Short tons	Fine ounces	Value	Fine ounces	Value	Pounds	Value
1904.....	3	460	306.72	\$6,340	-	-	-	-
1905-06..	-	-	-	-	-	-	-	-
1907.....	6	7,316	7,371.38	152,380	655,480	\$432,617	-	-
1908.....	16	2,090	2,656.76	54,920	265,425	140,675	5,212	\$688
1909.....	8	1,211	1,723.74	35,633	140,204	72,906	-	-
1910.....	15	1,164	2,083.13	43,062	162,541	87,772	2,417	307
1911.....	14	19,463	5,998.02	123,990	456,066	241,715	-	-
1912.....	10	58,434	17,325.70	358,154	1,434,068	881,952	6,196	1,022
1913.....	12	83,901	15,630.15	323,104	1,383,257	835,487	4,292	665
1914.....	19	114,771	15,435.16	319,073	1,545,926	854,897	3,892	518
1915.....	13	123,991	13,866.40	286,644	1,620,573	821,630	19,167	3,354
1916.....	20	110,943	13,734.15	283,910	1,386,524	912,333	9,609	2,364
1917.....	13	60,587	8,408.35	173,816	887,765	731,518	4,030	1,100
1918.....	13	49,950	4,970.09	102,741	625,152	625,152	1,435	354
1919.....	12	40,892	5,816.13	120,230	488,053	546,619	-	-
1920.....	9	1,292	534.54	11,050	26,686	29,088	-	-
1921.....	9	70	32.60	674	3,837	3,837	194	25
1922.....	8	2,269	106.38	2,199	40,971	40,971	13	2
1923.....	11	1,104	114.74	2,372	30,601	25,093	174	26
1924.....	10	101	13.55	280	5,157	3,455	129	17
1925.....	9	1,445	123.45	2,552	67,204	46,640	1,914	272
1926.....	8	896	210.43	4,350	27,490	17,154	1,453	203
1927.....	7	368	60.37	1,248	7,078	4,013	443	58
1928.....	4	625	138.35	2,860	4,687	2,742	1,112	160
1929.....	3	976	13.96	289	3,147	1,677	498	88
1930.....	3	1,047	39.09	803	3,327	1,281	55	7
1931.....	4	417	245.45	5,074	13,396	3,885	-	-
1932.....	5	225	43.85	906	748	211	-	-
1933.....	6	78	47.09	973	1,677	587	-	-
1934.....	17	2,545	1,728.16	60,399	12,124	7,838	1,596	128
1935.....	19	5,378	1,926.25	67,419	33,348	23,969	372	31
1936.....	26	4,173	1,937.00	67,795	60,792	47,083	-	-
1937.....	15	2,738	896.00	31,360	61,419	47,508	-	-
Total.	-	700,920	123,537.14	2,646,605	11,454,723	7,492,305	64,203	11,389

TABLE 2.- Gold, silver, copper, and lead production in Church-hill County, Nev., 1904-37, in terms of recovered metal (cont'd.)
(Compiled by Charles White Merrill, Mineral Production and Economics Division, Bureau of Mines)

Year	Lode				
	Lead		Total Value	Average recoverable value of ore ^{1/}	Total Value (lode and placer)
	Pounds	Value			
1904.....	-	-	\$6,340	\$13.78	\$6,340
1905-06.	-	-	-	-	-
1907.....	-	-	584,997	79.96	584,997
1908.....	1,690	\$71	196,354	93.95	196,354
1909.....	26,602	1,144	109,683	90.57	109,683
1910.....	31,602	1,390	132,531	113.86	132,531
1911.....	117	5	365,710	18.79	365,710
1912.....	6,538	294	1,241,422	21.24	1,241,422
1913.....	162	7	1,159,263	13.82	1,159,263
1914.....	10,518	410	1,174,898	10.24	1,174,898
1915.....	24,574	1,155	1,112,783	8.97	1,112,783
1916.....	8,902	614	1,199,221	10.81	1,199,221
1917.....	33,951	2,920	909,354	15.01	909,354
1918.....	39,090	2,775	731,022	14.64	731,022
1919.....	22,932	1,215	668,064	16.34	668,064
1920.....	12,659	1,013	41,151	31.85	41,151
1921.....	38,393	1,728	6,264	89.49	6,264
1922.....	545	30	43,202	19.04	43,202
1923.....	82,802	5,796	33,287	30.15	33,542
1924.....	37,803	3,024	6,776	67.09	6,776
1925.....	919,626	80,007	129,471	89.60	129,471
1926.....	447,788	35,823	57,530	64.21	57,530
1927.....	142,859	9,000	14,319	38.91	14,319
1928.....	219,156	12,711	18,473	29.56	18,473
1929.....	140,315	8,840	10,894	11.16	10,894
1930.....	30,348	1,517	3,613	3.45	3,613
1931.....	200	7	8,966	21.50	8,966
1932.....	-	-	1,117	4.96	1,117
1933.....	8,820	326	1,886	24.18	1,886
1934.....	152,232	5,633	73,998	29.08	73,998
1935.....	7,233	289	91,708	17.05	91,708
1936.....	6,000	276	115,154	27.60	115,154
1937.....	36,000	2,124	80,992	29.58	80,992
Total	2,489,457	180,144	10,330,443	14.74	10,330,698

^{1/} Not to be confused with average assay value of ore.

Small amounts of nickel, antimony, and tungsten ores also have been produced. In the industrial-mineral group considerable quantities of salt, probably about 500,000 tons, have been mined, chiefly for metallurgical use. Between 1870 and 1873 borax was produced from the salines in Sand Springs Marsh, Dixie Marsh, and Soda Lakes. Although no statistics are available as to the amount produced, it has probably been less than 1,000 tons. The production of sodium carbonate from Soda Lakes between 1868 and 1893 averaged about 400 tons annually, making a production of about 10,000 tons for the period. In addition, small amounts of diatomaceous earth and shell limestone have been mined in the county in former years.

Current mining activity is confined mainly to leasing, and the production of shipping ore for the past 2 years has averaged about 300 tons per month.

ALPINE DISTRICT

The Alpine district is in eastern Churchill County on the east side of the Alpine Range, about 13 miles northwest of Eastgate. It can be reached by automobile from Eastgate over a fair desert road through Edwards Creek Valley. The district was originally organized as the Clan Alpine district in January 1864 but is now generally known as Alpine. In 1864 a number of claims were located for silver in the vicinity of Florence Canyon, and considerable work was done on them. In 1866 the Silver Lode Mining Co. erected a 10-stamp mill at the mouth of Cherry Creek, where the camp of Alpine was laid out. A number of stone buildings, now in ruins, attest this early activity. The veins proved to be narrow and low-grade, so that the district was abandoned after several years. Except for sporadic prospecting, there has been little mining since the early days. In all probability not more than a few thousand dollars has been produced. In April 1939 the only mining in this area was on the Nevada Gold group of claims.

Nevada Gold Group

The Nevada Gold group, comprising three unpatented claims owned by Sam Spring of Fallon, is at the head of Stone Canyon, 33 miles by road north of Eastgate. This property was prospected in the early days, but there is no record of any production. From the size of several small stopes, however, production probably has been several hundred tons of shipping ore. Early in 1939, Spring, working single-handed, mined about 50 tons of shipping ore.

Development consists of a crosscut adit 500 feet long that is filled with detrital material washed in by cloudbursts. A second adit has been driven on the vein for about 100 feet. These workings, with several scattered open-cuts and a shaft 130 feet deep, total approximately 800 feet. The only equipment on the property consists of tools for hand-mining and several camp buildings. There is a small perennial stream in Stone Canyon that probably could furnish enough water for a small mill.

The formation is slate intruded by monzonite. The ore occurs in two nearly parallel fissure veins traversing both the slate and monzonite. The vein on which most of the work has been done strikes N. 10° E. and dips 50° westerly. The economic minerals are silver, gold tetrahedrite, galena, and sphalerite and their oxidation products in a gangue composed chiefly of quartz with a little pyrite. Width of veins ranges from a few inches to 5 feet, and where the ore has been stoped the veins average about 2 feet in width.

BERNICE DISTRICT

The Bernice district is on the west slope of Clark Alpine Range in east Churchill County, 90 miles by road, a little south of west from Fallon and 70 miles southeast of Lovelock, both towns being on the Southern Pacific R. R. From Fallon the district can be reached by automobile over the Lincoln Highway to Dixie Valley turn off, a distance of about 40 miles, and thence up Dixie Valley to the mines situated in Bernice and Hoyt Canyons. The last 25 miles of road is in poor condition, but with careful driving is passable.

Silver and antimony ores were discovered in the district in the late eighties. The principal ore mined has been silver ore from the Williams mine; probably about 500 tons of antimony ore has been shipped. In 1939 the only activity in this area was by lessees on the Bluebird group of claims.

Silver Deposits

The Williams mine at the head of Bernice Canyon comprises two patented and three unpatented claims owned by the Warren W. Williams estate. This property was discovered by James Wardell in the late seventies and was sold to Williams, who operated it from 1880 to 1890. A 10-stamp mill was erected below the mine in Bernice Canyon; silver produced is said to have amounted to \$300,000. The ores contained considerable arsenic in the form of arsenopyrite, and the mill was equipped with two White-Howell roasters. The ore is in a series of narrow veins in shale. The outcrops carried considerable antimony, which decreased at depth. The mine has been inactive for many years.

The tailings pile below the old mill site, containing about 6,000 tons, is owned by C. M. Beeghly and L. T. Ellis, according to a location notice dated March 18, 1939.

The Bluebird group, comprising six unpatented claims owned by Albert Lofthouse, of Fallon, is in the northern part of the district. In 1939 the property was under lease to D. G. Brunner, A. J. Cooley, and associates, who, up to April 1939, had made one small shipment of ore to the McGill smelter. Here the ore occurs in a narrow vein in limestone.

Antimony Deposits

Antimony was first discovered in the district in the eighties by H. Hoyt. W. W. van Reed shipped several cars of hand-sorted ore containing 62 percent antimony to the Star and Matthews smelter in San Francisco. A small quantity