

R E P O R T
OF
THE GOVERNOR OF ARIZONA.

EXECUTIVE DEPARTMENT OF ARIZONA,
Phoenix, Ariz., September 1, 1893.

SIR: In compliance with the request contained in your letter of July 18, I respectfully submit the following report on the condition of affairs in Arizona Territory.

The chief difficulty encountered at the outset is the fact that the legislature has made no provision for the collection or compiling of statistics; hence, in some instances general statements must take the place of exact details. Nevertheless, the statistics which are given may be relied upon, and the general statements are treated in a conservative spirit.

During the past year the condition of the Territory has been one of average prosperity. While there have been two commercial failures, and only one in the banking business up to the time of writing, the Territory has experienced the severest depression in some of its most important industries. The shrinkage in the value of silver, for example, has resulted in the closing of almost all of our silver mines. The output for the year was less than \$300,000, whereas in 1881, when the output was at its highest point, it reached \$6,278,895. Again, owing to the absence of the usual rainfall, extending over a period of two years, there was a loss in range stock reaching, it is estimated, from 50 to 60 per cent. However, this depression has been, in a measure, counterbalanced by the renewed activity which has been experienced in other channels. The depression in silver has stimulated prospecting and mining for gold, with results which it is safe to predict will place Arizona among the leading gold-producing regions of the Union. The loss in range stock has been more or less compensated for by agriculture and horticulture. The increased interest manifested in the reclamation of arid lands has been most pronounced. Several large irrigation and water storage enterprises have been inaugurated and many more are under way. Vast areas of arid land have been reclaimed to agriculture, which is an evidence that investors are beginning to recognize that this source of investment is at once safe, permanent, and profitable.

The increase in population has been gradual, but confined to the agricultural districts; schools, educational and moral forces have been rapidly acquiring additional strength. Owing to our superb climate the health of our people in every section of the Territory has been without a parallel in the United States.

POPULATION.

The Tenth United States Census Report gave Arizona 40,440 souls, and the Eleventh Census gives it as 59,620, exclusive of Indians. The increase since the last census has been variously estimated at from 5,000 to 10,000. A conservative estimate would place the population to-day at 65,000. The following vote for Delegate to Congress may give a basis as to the growth of population :

1880.....	7,701	1888.....	11,538
1882.....	11,262	1890.....	11,078
1884.....	12,491	1892.....	11,641
1886.....	10,827		

Thus it will be seen that the vote for 1892 was smaller than it was for 1884. Yet the change of population can not be gauged by this standard, inasmuch as the class of immigrants since the settlement of the Indian question has been one largely of families, whereas previous to that time it was mainly composed of adventurous pioneers. As to the source of the population during the past year, it has been chiefly contributed by the Southern and Western States and has been distributed in the valleys of the Salt and Gila rivers, owing to the extensive reclamation of land in this section. The immigrants are made up of the best class of American citizens, who have brought with them well-matured American ideas, a spirit of thrift, and a love of good citizenship. Hence they are a valuable acquisition. It is fair to estimate that three-fourths of the entire population are native-born Americans, representing every State in the Union. The people have broad and liberal views upon all questions of public concern, social and political.

The following is the foreign population, as given in the census of 1890 :

Mexican.....	11,334	Irish.....	1,171
English.....	1,116	German.....	1,188
Chinese.....	1,199	French.....	296
Italian.....	217	Swedish.....	168
Danes.....	180	Scotch.....	318
Austrian.....	105	Swiss.....	144
Welsh.....	85	Norwegian.....	59
Russia.....	53	Australian.....	38
Spanish.....	21	Portugese.....	19
Africa.....	10	Belgium.....	17
South America.....	33	West Indies.....	14
Holland.....	17	Poland.....	13
Hungary.....	9	Greece.....	7
Pacific islands.....	6	Sea.....	5
Hawaii.....	3	Japan.....	3
Atlantic islands.....	2	India.....	3
Bohemia.....	3	Canada.....	722
Central America.....	11	Not specified.....	4

The following is a tabulated statement of the taxable property of the Territory:

County.	Acres of land.	Value.	Value of improvements.	Value of city and town lots.	Value of improvements.
Apache	1,914,125.00	\$260,780.00	\$59,548.00	\$58,526.00	\$118,951.00
Cochise	108,980.00	89,073.00	227,243.00	69,747.00	225,387.00
Cocconino	511,146.98	213,186.40	65,830.00	87,400.00	146,730.00
Graham	49,084.00	463,808.31	139,353.00	13,068.00	63,711.00
Gila	6,920.00	116,320.00	131,573.00	29,507.00	93,335.00
Maricopa	209,639.00	2,688,480.00	230,745.00	1,993,683.00	700,285.00
Mohave	423.00	16,460.00	137,645.00	8,740.00	30,730.00
Pima	*135,913.00	*142,363.00	168,225.00	338,601.00	739,976.00
	209,603.00	402,053.00			
Pinal	24,607.00	41,012.50	136,590.00	63,936.90	105,973.40
	42,359.44	302,805.25	126,892.00		
Yavapai	228,206.64	324,561.89	171,745.00	214,179.50	377,775.00
Yuma	22,500.00	137,612.00	8,625.00	109,208.00	40,065.00
Total	3,463,507.06	5,198,515.35	1,604,014.00	2,986,591.40	2,642,682.40

County.	Horses.		Stallions.		Mules.		Burros.		Cattle.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Apache	4,620	\$114,115.31			23	\$620.00			39,933	\$310,202.06
Cochise	3,386	69,659.00	19	\$1,410	277	9,565.00	59	\$335.00	45,056	316,426.00
Cocconino	4,781	118,149.72			33	1,490.00			51,315	398,081.07
Graham	3,700	103,008.00			168	5,530.00			64,800	489,583.85
Gila	3,114	69,310.00			72	1,895.00			53,952	405,202.58
Maricopa	6,056	181,575.00			523	13,008.00			22,974	235,274.60
Mohave	2,085	51,535.50			24	1,055.00			26,811	200,835.79
Pima	4,441	92,652.36			283	6,386.00			49,599	347,542.77
Pinal	2,315	50,370.00			229	4,760.00			27,002	203,356.71
Yavapai	6,577	212,469.00			41	1,625.00			107,018	802,228.22
Yuma	367	9,535.00			134	4,635.00			3,352	84,203.00
Total	44,342	1,072,378.89	19	1,410	1,807	51,050.00	59	335.00	491,812	3,742,936.65

* Granted land.

County.	Bulls.	Cows.	Value.	Goats.	Value.	Hogs.	Value.	Sheep.	Value.	Asses.	Value.
Apache				304	\$456.00	220	\$609.50	120,942	\$242,212.30	116	\$710.00
Cochise	101		\$2,237.00	603	713.00	137	464.00	8,312	16,624.00		
Cocconino				18	36.00	237	931.50	221,097	445,438.00	42	1,587.50
Graham				559	1,030.00	387	1,117.00	27,311	54,622.00	242	2,273.00
Gila				143	158.00	238	622.00	5,300	10,605.00	235	1,906.00
Maricopa						3,414	10,765.15	15,010	30,305.00	36	1,502.00
Mohave		84	1,360.00	900	900.00	100	279.50	1,250	2,500.00	61	530.00
Pima				170	319.00	408	1,495.00	2,175	4,352.18	123	735.00
Pinal				50	50.00	185	638.00	2,200	4,400.00	121	674.00
Yavapai				1,218	1,891.00	612	1,989.00	18,188	36,381.00	323	3,437.00
Yuma						133	376.00	12	24.00	26	235.05
Total	101	84	3,596.00	4,005	5,553.00	6,071	19,286.65	421,797	847,463.48	1,325	13,589.00

County.	Miles of railroad.	Value.	All other property.	Total valuation.
Apache	111.69	\$558,450.00	\$162,868.15	\$1,888,048.32
Cochise	171.05	1,098,867.73	387,856.50	2,515,607.23
Cocconino	121.67	548,350.00	287,175.50	2,314,385.69
Graham	41.00	143,009.44	373,979.00	1,892,002.60
Gila	12.00	37,910.00	163,441.00	1,023,874.58
Maricopa	94.57	605,822.78	810,731.00	7,502,156.53
Mohave	114.377	571,885.00	80,550.00	1,105,005.79
Pima	121.4	766,468.79	957,074.00	3,968,508.10
Pinal	79.79	525,627.52	174,880.80	1,741,967.08
Yavapai	133.84	569,150.00	796,408.47	3,513,840.08
Yuma	80.00	544,240.00	132,034.00	1,020,787.00
Total	1,087.387	5,969,781.26	4,326,998.42	23,486,183.00

It appears from the foregoing that the Territory has taxable property assessed as follows:

3,463,507.06 acres of taxable land.....	\$5,198,515.35
Improvements thereon.....	1,604,014.00
City and town lots.....	2,986,591.40
Improvements thereon.....	2,642,682.40
401,812 cattle.....	3,742,936.65
421,797 sheep.....	847,463.48
44,342 horses.....	1,072,378.89
1,807 mules.....	51,050.00
1,325 asses.....	13,589.50
4,005 goats.....	5,553.00
6,071 hogs.....	19,286.65
185 bulls.....	3,597.00
19 stallions.....	1,410.00
59 burros.....	335.00
1,087,387 miles of railway.....	5,969,781.26
All other property.....	4,826,998.42
Total.....	28,486,183.00

It will be seen that the valuation is:

Land per acre.....	\$1.50
Cattle per head.....	7.61
Horses per head.....	24.18
Sheep per head.....	2.00
Railroads per mile.....	5,490.00

Assessed valuation, each year, of the counties of Arizona, from 1883 to 1893, inclusive.

County.	1883.	1884.	1885.	1886.	1887.	1888.
Apache.....	\$1,663,761.00	\$1,083,870.00	\$1,422,450.00	\$2,854,990.94	\$2,601,905.28	\$2,569,271.80
Cochise.....	14,722,823.97	11,856,491.86	10,659,646.35	3,050,882.72	3,392,665.19	2,880,012.85
Gila.....	1,115,495.68	780,752.70	691,685.00	629,678.50	661,984.29	627,333.00
Graham.....	575,767.00	1,159,518.09	1,139,267.44	1,242,888.10	2,088,583.73	1,588,090.35
Maricopa.....	1,934,501.00	2,077,980.00	2,266,772.00	2,342,310.00	3,301,056.35	3,999,418.00
Mohave.....	1,951,529.00	1,796,753.00	1,854,079.00	1,040,780.87	1,688,656.00	2,238,078.77
Pima.....	4,896,493.62	5,295,906.72	4,282,114.83	3,449,054.53	4,670,784.39	3,813,009.54
Pinal.....	1,909,852.72	1,721,583.99	1,603,771.85	1,644,087.44	1,842,465.23	1,814,332.00
Yavapai.....	6,430,329.82	3,686,077.75	3,906,980.17	6,250,853.65	5,225,648.45	5,619,555.22
Yuma.....	806,306.20	808,831.95	765,845.80	702,391.80	779,757.20	763,913.79
Total.....	36,006,860.01	30,227,765.97	28,682,612.44	23,206,918.65	26,193,506.11	25,918,015.23

Counties.	1889.	1890.	1891.	1892.	1893.
Apache.....	(*)	\$3,710,554.43	\$2,634,258.14	\$2,220,262.58	\$1,088,048.32
Cochise.....	\$3,313,316.48	2,981,719.89	2,981,769.32	2,840,819.12	2,515,607.23
Cocconino.....			1,975,975.98	2,190,762.74	2,314,385.69
Gila.....	1,061,263.50	1,183,472.10	1,309,233.20	1,110,036.08	1,023,874.58
Graham.....	1,557,076.66	1,486,169.99	1,687,797.94	1,654,408.32	1,892,002.60
Maricopa.....	4,844,801.00	5,583,214.30	5,709,864.74	6,238,325.13	7,502,156.53
Mohave.....	3,211,084.25	1,185,537.80	1,147,580.07	1,070,380.45	1,105,005.79
Pima.....	3,840,268.23	3,845,399.56	4,081,279.85	3,994,718.54	3,968,508.10
Pinal.....	1,851,450.58	1,903,401.53	1,967,974.54	1,731,630.56	1,741,967.08
Yavapai.....	6,602,885.29	5,819,426.63	4,034,137.99	3,814,684.66	3,513,840.08
Yuma.....	775,314.16	851,338.50	749,564.51	1,057,134.37	1,020,787.00
Total.....	27,057,467.15	28,050,234.73	28,279,466.28	27,923,162.55	28,486,183.00

* No returns.

BONDED INDEBTEDNESS OF ARIZONA TERRITORY, INCLUDING THE COUNTIES.

The following tabulated statement from the report of the Territorial treasurer, dated January 1, 1893, exhibits the obligations of the Territory and counties, the interest paid, the indebtedness funded into 5 per cent bonds under the act of Congress:

County.	Issue of—	Rate.	Amount.
		<i>Per ct.</i>	
Coconino County	1891	7	\$72, 000
Pima County	1887	7	250, 000
Pinal County	1890	6	6, 000
Do	1885	10	9, 000
Graham County	1883	10	15, 000
Do	1889	7	50, 000
Yuma County	1887	10	110, 000
Maricopa County road	1885	7	3, 000
Maricopa County insane asylum	1885	7	3, 500
Maricopa County B. C. road	1885	7	2, 500
Maricopa County railroad	1887	7	2, 000
Maricopa County court-house	1883	10	30, 000
Maricopa County refunding	1888	7	15, 000
Maricopa County hospital	1883	10	5, 000
Maricopa County school	1889	7	8, 000
Apache County funding	1888	7	100, 000
Apache County jail	1883	8	5, 000
Yavapai County	1885	7 and 8	448, 000
Cochise County	1891	7	195, 000
Gila County	1887	7	8, 000
Not funded:			
Territorial prison	1879	10	15, 000
Do	1880	10	15, 000
Gillett and Tiger wagon road	1879	10	20, 000
Florence and Globe wagon road	1879	10	10, 000
Tucson and Globe wagon road	1879	10	10, 000
Agua Fria and Camp Verde	1879	10	10, 000
Yuma and Ehrenburg wagon road	1881	10	10, 000
Insane asylum	1885	7	100, 000
Wagon road and bridge	1885	8	12, 000
Gila bridge	1885	8	15, 000
University	1887	7	25, 000
Funding bonds	1888	6	150, 00
Territorial funding bonds	1891	5	1, 227, 000
Total bonded debt			2, 956, 000

BONDED AND FLOATING DEBT OF THE TERRITORY OF ARIZONA.

Amount of old bonds outstanding that can not be funded	\$392, 000. 00
New 5 per cent bonds issued for the redemption of bonds of 1883	202, 785. 00
New 5 per cent bonds issued for the redemption of floating debt incurred prior to January 1, 1891	92, 330. 00
Floating debt incurred since January 1, 1891, less cash on hand at this date	101, 400. 00
Total debt	788, 515. 00
Funding 5 per cent bonds issued to date	1, 227, 000. 00
Amount due from counties	\$900, 604. 23
Cash and warrants not entered	31, 280. 77
	931, 885. 00
The Territory's pro rata of 5 per cent bonds	295, 115. 00

AMOUNT SAVED ANNUALLY BY FUNDING THE BONDED AND FLOATING DEBT OF THE TERRITORY WITH THE FUNDS OF 1890.

Amount paid before funding:

Floating debt, \$481, 673. 66, at 10 per cent	\$48, 167. 36
Bonded debt, \$254, 000, at 10 per cent	25, 400. 00
Bonded debt, \$24, 000, at 6 per cent	1, 440. 00
Bonded debt, \$274, 500, at 7 per cent	19, 215. 00

94, 222. 36

Amount paid after funding:

Funding bonds, \$1, 227, 000, at 5 per cent.....	61, 350. 00
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Amount saved annually	32, 872. 00
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SETTLEMENT OF LANDS.

From the reports of the United States land offices of this Territory it appears that there were entered under the homestead law 58,403 acres, of which 38,436 were entered at the Tucson office for the southern district and 16,967 in the United States land office at Prescott for the northern district. Under the desert-land law there were entered 88,327 acres, of which 85,983 were entered at Tucson for the southern tier of counties and 2,344 at Prescott for the northern tier. Of the former, 65,043 were entered in Maricopa County and 16,740 in Yuma County. The total acreage entered was 143,730. All of this land is being reclaimed by irrigation. The Tucson land district, not including Indian or military reservations, embraces about 20,000,000 acres of land. The approximate quantity of public lands subject to entry in the Tucson district is about 5,000,000 acres, and the approximate quantity of unsurveyed land in the same district is a fraction over 18,000,000 acres. In the northern or Prescott district an approximate estimate of the unsurveyed lands is 19,000,000 acres. In giving this estimate the register of the land office, the Hon. J. H. Martin, says:

There is quite a large amount of worthless and mountainous land embraced in this unsurveyed land, but there are some fine valleys and excellent timber land which could be disposed of to advantage to the Government as well as to the Territory by the revenue that it would bring in the way of taxes. With reference to the Tucson or southern district it may be added that a large portion of the unsurveyed as well as the surveyed land could be reclaimed to agriculture by irrigation, the water being supplied from reservoirs, for the construction of which there are many natural sites.

RECLAMATION OF LAND AND IRRIGATION.

Thus far the settlement and cultivation of land has been principally in the valleys on the line of flowing streams. There are probably not more than 10,000 acres successfully cultivated in the Territory without the aid of irrigation, and these are to be found in the northern part in valleys of high altitude. The extent to which irrigation has been developed and land reclaimed is shown by the following figures:

County.	Miles of canals.	Acres served.
Maricopa	346	270, 000
Yuma	123	105, 000
Graham	202	72, 000
Pima	55	12, 500
Apache	125	14, 000
Total.....	851	573, 500

Gila and Cochise counties have about 7,000 acres of land under cultivation by means of irrigation. Thus it will be seen there are several hundred miles of irrigating canals, reclaiming over 573,500 acres of land. It will be observed that some of the canals mentioned serve a much less quantity of land per mile than others. This is owing to the fact that their capacity is much less. For instance, some of the canals in Maricopa County have a width of from 50 to 75 feet at bottom, and, in fact, are as large as some of the canals of navigation, and the laterals or ditches which run therefrom carry as much water as the main canals in other counties.

Of the 346 miles of canals in Maricopa County 38 miles were constructed during the past year, furnishing 60,000 acres of land with water. With these canals there are also about 2,000 miles of laterals used for the distribution of the water on the land irrigated. As to Yuma County, 24,000 acres of the 105,000 under irrigation were reclaimed during the past year. A canal to be 75 miles in length is being constructed, which will reclaim 161,000 acres of land.

A large amount of the land referred to, while it has been entered in the land office and is being reclaimed, is not yet subject to taxation and does not appear on the tax rolls, as final proof has not been made.

NEW IRRIGATION ENTERPRISES.

In addition to the above there is a number of proposed extensions of canals, construction of reservoirs, and new canal systems, which, when completed, will give in the aggregate 557 miles of canals, carrying water sufficient to reclaim 2,044,000 acres of arid land. These extensions appear to be reasonably certain of being carried to a conclusion, while there are equally as many in a state of formation. The figures quoted give an idea as to the extent to which farming, aided by irrigation, is being conducted in Arizona.

Upon this subject I can do no better than submit the following report from O. B. Thornton, president of the South Gila Canal Company. It is valuable because the statement made applies to a number of other irrigating enterprises as well as to the conditions of agriculture within the greater portion of southern Arizona. The report says:

The ultimate accomplishment of the South Gila Canal Company will be the reclamation of about 500,000 acres of desert land in Maricopa and Yuma counties, Ariz., divided about nine-tenths in Yuma County and one-tenth in Maricopa, and relatively 180,000 acres south of the Gila River and 320,00 acres on the north side.

The waters of the Gila will be impounded and diverted by a dam 50 feet high, built of solid masonry laid in hydraulic cement.

The dimensions of the dam are 1,400 feet long, 106 feet broad at the base, 13 feet at the top, and 50 feet high. This is the dam now in process of construction.

It is the intention of the company to broaden the base and carry the dam up to a total height of 110 feet, creating a great inclosed lake, impounding water sufficient to copiously irrigate 1,000,000 acres for three years without augmentation from the natural flow of the river. This will be a work supplementary to that which the company has now on hand.

In addition to the main storage above the river dam, the first 14 miles of the canal is a continuous storage reservoir, covering approximately 3,500 acres. This is known as the distributing reservoir in contradistinction to the main or river reservoir. Its capacity is 92,000 acre feet and the main reservoir 160,000 acre feet, making a total of 252,000 acre feet held in storage.

The canal where it leaves the storage reservoir will be 100 feet wide on the bottom with slopes of bank $1\frac{1}{2}$ to 1, with a flow of water 6 feet deep and a grade of 7 inches to the mile. Our engineers adopted this grade in order to avoid erosion in the light loamy soil. The canal travels through the irrigable mesa it is designed to cover, or rather irrigate. As the lateral and distributing ditches are taken out the width will be correspondingly narrowed.

The land proposed to be irrigated south of the Gila River by the present canal is divided about as follows: 18,000 acres river bottom, a deep, rich, sandy loam, and 162,000 acres upland or mesa. The mesa is uniformly a deep, rich, sandy loam, very retentive of moisture. It is smooth and level to an extraordinary degree, the slopes being adapted to easy irrigation without erosion.

The location, being in the extreme southwestern portion of Yuma County and of the Territory, gives this a semitropic climate, which adapts it to the greatest possible range of productions. Wheat, rye, oats, barley, and alfalfa make enormous crops, while the range of fruits is almost illimitable.

All the deciduous fruits adapt themselves to the soil and climate, and mature fully one month earlier than in California. Every variety of the grape family finds congenial conditions for rapid growth and the most beautiful fruitage. Here the fine raisins of Malaga will be duplicated, if not surpassed, and the rich, heavy wines of Spain and Portugal can be imitated to that degree that none but experts can detect the difference.

The citrus fruits will be as conspicuous as at Riverside and Redlands, Cal. But it is not to the orange that people will look for their profits, but rather the lemon. California, while producing a marketable lemon, has never yet produced one of a quality anywhere approaching those of Sicily, which form the standard of excellence in this fruit.

Yuma is the only spot in America that has come up to this standard. This fact has been conceded by those familiar with Yuma's product. The trees grow large and bear heavily. In 1892 the Hon. J. W. Dorrington kept an account of sales from a six-year old tree growing in his grounds in the town of Yuma and found the proceeds to be \$56. This year his trees are as heavily loaded as last. One hundred such trees may be grown on an acre of land.

Under the Mohawk Mountains and below the South Gila Canal there are forty sections of land as perfectly adapted to lemon culture as that in the town of Yuma. This land is protected by the mountains from the southwest winds, and is below the frost belt. The soil is deep, gravelly loam, the best possible for the perfection of the lemon and lime and the early maturity of their fruit. That lemon-growers on this belt of land will net immense profits there can be no doubt. One thousand dollars per acre net profit from the sixth year onward will be no fancy figure.

As all who desire lands can not get lemon lands the question arises as to what will be the next best. I should say grapes, and after the grape the peach and apricot.

Leaving the domain of fruit, alfalfa, with cattle, sheep, and hogs, will make an easy going business and one that will net 10 per cent per annum on a valuation of \$100 per acre for land and water, the value of stock, improvements, and maintenance added. The accuracy of this estimate can be demonstrated. When the South Gila Canal is completed and the rich lands under it are subdivided and settled upon as in southern California 30,000 population will have been added to the county of Yuma and to the Territory of Arizona. With the North Side Canal built and the land settled up another 40,000 will be added to our population.

Such are the logical deductions drawn from this one enterprise. What then are we to infer when the many other and similar enterprises in Arizona are carried out, as they must and will be in the near future?

THE ARID REGION.

It is estimated that there are 10,000,000 acres of land in Arizona capable of reclamation to agriculture, provided the necessary water can be supplied. How can this be accomplished? The question of the reclamation of the arid region is now one of public concern in the vast section west of the Mississippi River. So important a place does it occupy in the public mind that an international convention is announced to be convened at Los Angeles October 10 for the purpose of considering it in its various phases. Efforts have been made to secure Congressional appropriations for the construction of reservoirs, sinking of artesian wells, etc., to aid in this reclamation.

It has also been suggested that the Federal Government should reclaim these lands and reimburse itself by an increased price for their sale. It has likewise been suggested that a loan should be made by the Federal Government to the Territory or State of sufficient money to reclaim these lands, the Government taking as security for the loan

bonds at 2 per cent interest. Among the many plans offered the following seems to be worthy of consideration:

That Congress be asked to pass an act allowing the organization of irrigation districts, to include the counties now contained in the United States land districts.

The commissioners to be elected by the people of the district to administer the affairs of the district.

That the land officials of the district be authorized and directed to issue to the district commissioners reservoir-lien bonds against each irrigable quarter section of land lying below said reservoirs; these bonds to be payable at the end of twenty-five years and to bear interest at a fixed rate per annum; the bonds to stand as a lien against each quarter section of land and to be assumed by the settler when he shall obtain title to the land; the amount of the bond to be determined by the estimates of the cost of the reservoir and canal system, and the number of acres of irrigable land to be determined by surveys.

All lands to be sold at not less than double the present minimum price and the proceeds applied to the payment of the lien bonds on the land.

The annual water rental to be only sufficient to pay the annual expenses of maintaining the system.

The reservoir works to be constructed under the direction of Government engineers.

In support of this proposition the following arguments are adduced: With the system there would be no chance for monopoly of either the land or water. The works would be constructed by and for the actual settler, who would receive the full benefit. The General Government would incur neither expense nor responsibility. The area of land that can be irrigated from these systems in the Salt and Gila valleys alone is probably 3,000,000 acres. The cost of the work would be about \$6,000,000, or a tax lien of \$2 per acre. The present value of the water rights is \$10 to \$20 per acre. The land is all rich and desirable for fruits, grasses, and grains.

THE POLICY RECOMMENDED.

I believe that the most conservative and practical policy, and the one which would bring the best results, would be the ceding by the Federal Government of the arid lands to the Territories or States in which they are located, with such limitations as to their disposal as might be deemed advisable. We are not without precedent for such action. The proposed plan is analogous to that adopted with reference to the swamp lands of the Mississippi Valley. Congress ceded many million acres of land within the States in this region to enable the people to build dikes and levees to protect these lands from the overflow of the river, and thus secure them for agricultural purposes.

If the arid lands were under the control of the Territories or States they could be utilized for securing of capital necessary for their reclamation, by granting each alternate section or less of lands reclaimed as a bonus to the investors.

All these lands, which are now held at \$1.25 per acre, would, when reclaimed, sell readily at from \$25 to \$50 per acre, as experience shows. Another plan would be the sale of bonds secured by the land, the bonds to be redeemed by the sale of the land. For illustration, required \$1,000,000 to store sufficient water to irrigate 100,000 acres of land this land under irrigation would readily sell at from \$25 to \$50

per acre. It would only be sold to bona fide settlers in small holdings, on the installment plan, the money so realized to be used as a sinking fund for the redemption of the bonds. When redeemed the water system itself would belong to the Territory, or to the land it served, according to the law made to govern the same. There is no doubt that if either of these policies were adopted there would be a vast amount of capital anxious to invest in such a safe, permanent, and profitable source of gain. I would add that the States and Territories to which these arid lands were ceded would no doubt readily pay therefor the present Government price \$1.25 per acre, this price to be a preferred claim when the lands are sold by the States or Territories.

ITS NATIONAL IMPORTANCE.

This question of the reclamation of the arid lands assumes a national aspect from another point of view. Railroad building has, in a great measure, ceased, and consequently the building of these reservoirs and canals would open up a new channel for capital and would give employment to many thousands of people heretofore engaged in work in constructing lines of transportation. It would also prove a safety valve to the overcrowded cities of the East, where thousands of idle men are seeking employment and homes in vain. It is safe to predict that many of those who would engage in the reclamation of these lands would themselves turn to agriculture, especially in this favored region of the Southwest, where there is almost perpetual summer. Thus a large addition would be made to the taxable property of the States and Territories, and thousands of families provided with farms and homes in this arid region.

TOPOGRAPHICAL SURVEYS.

A few years ago, by the aid of appropriations for the irrigation survey, under the direction of the U. S. Geological Survey, a systematic search for and survey of all available sites for the storage of water was carried on in several of the Western States and in the Territories, but it was not extended to Arizona. Something in this direction is very desirable, but as the appropriations for the purpose have been discontinued I would recommend the extension of the geological surveys to this Territory. The information which would be thus gained would be invaluable in both irrigation and mining operations.

AGRICULTURE.

It is only within the last few years that the agricultural possibilities of this Territory have come to be realized. Yet it is doubtful if there is a section of the country where the virgin soil is so full of vitality or gives such bountiful returns to the farmer as the valleys and mesa lands of this Territory when brought under the fructifying influences of irrigation, which is the system of farming prevailing exclusively throughout this region. This system yields the very best results. Under it the farmer is not required to wait for rain in order to plow, sow, or cultivate. The crops come to a higher degree of perfection than in sections of the country where the condition of the elements affects the products of the season. Two crops a year are not uncommon in our principal valleys. Hay, especially alfalfa, is cut from four to six times annually. All the cereals, fruits, and vegetables grown in the temper-

ate and semitropic zones flourish here. Cereals give a yield of from 30 to 60 bushels per acre, according to the location. Alfalfa (French lucerne) grows luxuriantly, producing from 6 to 8 tons of hay per acre per year.

It is not difficult to understand that under such conditions agriculture and horticulture become most profitable industries. The fruit product, especially the grape in the Salt River Valley, yields a much greater supply than is necessary for the home demand. During the present year the raisin-grape crop in the valley mentioned amounted to 1,000 tons. Of this quantity about 800 tons will be cured, the balance being shipped to the Eastern market. One of the great advantages of horticulture in Arizona as compared with any other section is that fruit of all kinds matures from one month to six weeks earlier, not excluding even the most favored spots of California. Last season the Maricopa raisin producers shipped their first car load of raisins one month earlier than the Pacific coast fruit-growers. The same can be said of the products of Yuma and Pinal counties. The fig crop and similar fruits are shipped from these points to California a month earlier than they are from the home orchards and vineyards. Hence, great strides have been made during the year in planting orchards and vineyards with a view to supplying the outside markets. Thus far there has been nothing in the nature of insects to interfere with the healthy growth of our vines or citrus fruits. The fact that the climate is void of humidity and that, as a rule, the grape crop is cured before the arrival of the rainy season, is an important consideration and warrants the prediction that Arizona will be the largest raisin-producing section of this country. As much, I believe, is admitted by California.

FRUIT INDUSTRY DEVELOPMENT.

The result of the facts stated is that a great many farmers are coming into the Territory with the view of developing the fruit industry, and they are rapidly beginning to understand that 1 acre of land in Arizona, cultivated by means of irrigation, gives a greater profit with much less toil than 10 acres in the States east of the Mississippi Valley.

The agricultural lands are chiefly confined to the counties of Maricopa, Yuma, Graham, Pinal, Pima, and Apache, although all the other counties have more or less agricultural districts. It is through the counties named, however, that the streams flow from which water is diverted for irrigation purposes. While the area of land reclaimed by irrigation from surface streams during the year has been very large, quite a number of experiments have also been made with pumping machinery of various kinds, and with some degree of success. Especially is this the case in the Sulphur Springs and Santa Cruz valleys, where the underflow is from 10 to 20 feet beneath the surface. If this system prove a success many additional acres of land will be reclaimed to horticulture.

For more detailed information on the subject in general, gathered from experience and observation, I submit herewith the report of F. A. Gully, professor of agriculture at the Territorial University and director of the United States experiment station. The report is as follows:

The agricultural department of the University of Arizona, which includes the agricultural experiment station, has, for the past three years, been making a careful study of the agricultural conditions and possibilities of the Territory, and has secured valuable data in regard to the development of the agricultural interests.

SOILS AND WATERS.

Examination of the soils, repeated analyses of the waters of the streams during all the seasons of the year that are and may be used to supply the water for irrigation, and of underground water that lies within practicable pumping distance from the surface, as well as examination of the sites where large quantities of the surplus water that now runs to waste during the rainy season and when the snow melts in the mountains may be stored in reservoirs until needed, shows that while large areas of land are now cultivated still greater areas may be reclaimed. Repeated chemical tests prove that the waters of all our streams are good irrigable waters, and that some of them contain considerable quantities of valuable fertilizing elements.

There is fertile land and sufficient water to furnish homes for a large population. People are coming in rapidly from elsewhere in the country and making homes on new land. In the Salt River Valley alone the acreage of land under cultivation increased from 65,000 in 1890 to 150,000 in 1893, the increase being largely in small farms. From one station on the Phoenix and Maricopa Railroad line, a feeder of the Southern Pacific, there was shipped out in 1892, 2,955 tons of hay, 1,699 tons of wheat and barley, 276 tons of flour, 2,761 tons of cattle, and this not the principal shipping point on the line.

AGRICULTURAL ADVANTAGES.

Farmers, fruit growers, and gardeners in Arizona have a decided advantage over men engaged in like occupations in the Central, Northern, and Eastern States, and, in fact, in the Southern States, where crops depend on rainfall. On all of the valley lands crops are growing eleven months in the year. The winter consists of a few days in December and January, when there may be light frosts at night. In addition to the almost perpetual crop-growing seasons on these irrigated lands, the farmer has the additional advantage of being free from droughts and floods. He turns on the water when the crop requires it, after growing two crops in one year on the same land, and his harvest, always large in yield if he gives his work proper attention, is turned off with the certainty and regularity of the output of a manufacturing plant. Unlike farming where a good crop is dependent upon timely rainfall, the Arizona farmer makes his seasons to fit the requirements.

VARIETY OF CROPS.

The climate and soil of Arizona are adapted to all the crops of the country. With almost no exception, the crops of every other State in the Union are grown and yield as much or more per acre and of as good quality.

Cotton and sugar cane are as certain and productive as in the Gulf States, the small grains as in the North and West, vegetables and fruits as in the most favored localities; while the race and draft horse are grown and bred here, and have equal speed, strength, and weight, and all the breeds of cattle do equally well.

Even the dairy interest is not lacking, as private creamery and factory-made butter and cheese are made in considerable quantities and of fine quality. A good many of the large Holstein and more dimitutive Jersey cows have been brought in, and thrive as well and give as much milk and make as much butter as in the Mississippi Valley.

Many a farmer coming from the Eastern States is surprised to find Shorthorn, Hereford, Devon, and Polled cattle as large, sleek, and fat as in Illinois, and to learn that creameries are in operation; but such is Arizona to-day.

Poultry of all kinds thrive well, and it is the paradise of bee-keepers. The apiarists have a strong organization and market their honey, which has a high reputation in the East, in car-load lots.

While Arizona grows all of the farm products of other States, it affords special advantages for the production of certain things which are made more profitable than the staple crops of the country.

For the stockman and dairyman it provides a climate for growing alfalfa and the sorghums, for grazing and for forage, unequaled elsewhere.

The long season, warm and dry atmosphere, and almost no cloudy weather supply the essential climatic conditions to grow these two crops in the highest perfection.

The same climatic conditions are also most favorable for the production of a great variety of fruits of the finest quality. This has led to planting orchards, and the growing, shipping in the green state, canning and drying, and sale in the east, of fruits by the car load, and the business is rapidly extending.

During the past two years attention has been given to early vegetables and small fruits, especially in the southwestern part of the Territory, in the lower Gila and Colorado River valleys near Yuma.

This region has the lowest rainfall, (about 3 inches per year) the driest atmosphere, and the least cloudy weather during the winter and spring months of any portion of the country. The hardier vegetables, such as cabbage, cauliflower, and green peas, may be marketed at any time during the winter, asparagus and strawberries in February, tomatoes, cucumbers and squashes in March and April, and melons soon after.

In growing early vegetables and fruits for market, Arizona enjoys a monopoly that can not be wrested from her; in her dry, warm air, and exemption from cloudy weather during the winter and spring. Sunlight and dry air are necessary for the production of vegetables and fruits of the best quality, and when matured and packed under such conditions they will stand long transportation without deterioration.

The early vegetables and fruit grown along the Gulf coast—the earliest to reach northern cities—lack quality and flavor; maturing in a cloudy and moist climate, they must be gathered green and kept at a low temperature until they reach the consumer; and at best but a few people are willing to pay high prices for an inferior article to secure it a little in advance of the regular season.

Consignments of early vegetables and fruits from Arizona to Chicago and cities further east during the last two years have reached consumers in advance of all others, and of a quality never produced elsewhere for earliest shipments.

The demand for such products, and at high prices, is large and increasing, and this branch of agriculture promises to assume large proportions, as there is a large area of the Territory adapted to the work.

The latest plant to receive attention is new to farmers and to consumers, but it bids fair to become one of our leading crops. A wild plant that grows through southern Arizona and New Mexico, in moist spots here and there, known as canaigre (botanically—*Rumex hymenosepalus*), produces roots that contain, when dry, from 25 to 30 per cent. of tannic acid. The roots have been used by the Mexicans for the last hundred years in tanning hides, in a crude way, but have not received the attention of tanners until recently. During the past three years the roots have been thoroughly tested, and it is found they will make leather equal to oak and hemlock and other tanning products used in the trade.

Some 10,000 tons of roots of wild growth, after drying, have been gathered and used by tanners, mostly in Europe, since 1890, so that the merits of the plant are becoming known.

Seeing that the accessible wild growth would soon be exhausted the agricultural experiment station of Arizona began making experiments two years ago to learn more of the value of the plant and what could be done with it under cultivation. Samples of wild growth from all over the region where it is found were collected and tested and the roots planted and cultivated on various soils in different places to learn soil requirements, and at the same time experiments have been made to learn if the tannin could be extracted from the roots and placed in concentrated form for more economic transportation.

It is found that the greater part of the irrigable lands of southern Arizona are adapted to the growth of this plant, and that with proper cultivation and irrigation it will yield from 10 to 15 tons of roots per acre, and the cost of growing will not exceed \$2 per ton.

The tannin may be taken out of the roots and a liquid extract, containing from 35 to 45 per cent of tannic acid, made, or a dry extract, containing from 60 to 65 per cent of tannic acid, with suitable apparatus. The liquid and dry canaigre extracts are worth in the markets from \$75 to \$120.

The investigation has been thorough, and canaigre plantations are being started. An extract factory has recently been started in Deming, N. Mex., the extract placed on the market, and a number of tanners are beginning to use it.

So far as known, canaigre grows only in the hot, arid climate.

The agricultural development of Arizona is in its infancy, but the experimental stage of determining that its climate and soil are adapted to a number of specially valuable products, in addition to the usual farm crops and fruits of the country, is passed.

Two of the grand trunk lines of railway intersect the Territory east and west—the Southern Pacific and the Santa Fe systems—and from them branches have been and are now being built, so that ample facilities for shipping to the two seaboard and interior cities are assured.

RAILROADS AND COMMERCE.

There are now nine railroads being operated in the Territory, as follows:

	Miles.
Southern Pacific of Arizona.....	383
Atlantic and Pacific.....	393
New Mexico and Arizona.....	87
Prescott and Arizona Central.....	73
Arizona and New Mexico.....	38
Arizona and Southeastern.....	36
Prescott and Phoenix.....	60
Maricopa and Phoenix.....	34
Total.....	1,104

The Southern Pacific passes along the southeastern part of the Territory from Yuma, on the Colorado River, to the eastern boundary of Cochise County, passing through the counties of Yuma, Maricopa, Pinal, Pima, and Cochise.

The Atlantic and Pacific crosses north of the center of the Territory, near the thirty-fifth parallel, and passes through the counties of Apache, Yavapai, Coconino, and Mohave.

The New Mexico and Arizona runs from Benson, on the Southern Pacific, in Cochise County, to Nogales in the same county, at the Mexican line.

The Prescott and Arizona Central runs from Prescott Junction, on the Atlantic and Pacific, to Prescott, and is all in Yavapai County.

The Arizona and New Mexico runs from Clifton, in Graham County, to the Southern Pacific, at Lordsburg, N. Mex.

The Arizona and Southeastern runs from Bisbee, Cochise County, to Fairbanks, on the New Mexico and Arizona, in the same county.

The Maricopa and Phoenix runs from Maricopa, Pinal County, on the Southern Pacific, to Phoenix, Maricopa County.

The Santa Fé, Prescott and Phoenix runs from Flagstaff, on the Atlantic and Pacific, southward for 30 miles in the pine forest.

This last-named road was constructed principally to carry lumber from the pine regions. It is believed, however, that it will sooner or later be extended southward to Globe, and thence to a connection with the Southern Pacific Railroad, going, in all probability, by San Carlos up the Gila Valley to Bowie Station on the line mentioned.

During the year the Santa Fe, Prescott and Phoenix Railroad was constructed from Ash Fork to Prescott, a distance of 60 miles. It is proposed to extend this line to Phoenix, Florence, Tucson and Nogales, connecting with the Santa Fe road at the last-named point and terminating on the Gulf of California at Guaymas, thus connecting this portion of central Arizona with one of the most important ports on the Pacific coast.

The advantages arising from the construction of this road will be very great, as it will pass through the richest agricultural regions of the Territory and will be in the immediate vicinity of a continuous series of mining districts.

This will bring about an interchange of home products between the mining and the agricultural districts and northern and southern Arizona, keeping in home circulation a large sum of money which is annually sent to foreign markets for products of the soil which, owing to the lack of transportation facilities, is not now purchased in the Territory.

CUSTOMS.

The following statement from the Hon. S. F. Webb, collector of customs at Nogales, Ariz., will show the business of this customs district for this fiscal year:

Imports of foreign commodities into the district of Arizona for the year ending June 30, 1893.

Dutiable commodities.....	\$143, 735.00
Free of duty.....	3, 751, 805.00
Total importations.....	3, 895, 542.00
Duties collected.....	60, 673. 71

Ore importations.

	Value.	Rate per pound.	Duty.
Gold in ore.....	\$588, 472.00	Cents. Free.	None.
Silver in ore.....	1, 944, 899.00	do.....	Do
Lead in ore.....	68, 854.00	1	\$41, 834. 50
Copper in ore.....	19, 281.00	1	1, 917. 13
Total.....	2, 621, 406.00		43, 751. 63

The importations of gold and silver bullion and coin during the same period were as follows:

Gold bullion.....	\$511, 452.00
Silver bullion.....	383, 522.00
Mexican silver dollars.....	333, 763.00
Total.....	\$1, 218, 436.00

A comparison of these figures with those of last year is of interest:

1892:		
Dutiable imports.....	\$135, 455.00	
Gold and silver in ore.....	1, 454, 008.00	
Bullion and coin.....	1, 228, 737.00	
Total.....	\$2, 818, 200.00	
1893:		
Dutiable imports.....	\$143, 735.00	
Gold and silver ore.....	2, 533, 371.00	
Bullion and coin.....	1, 218, 436.00	
Total.....	3, 895, 542.00	

Increase of imports for 1893..... 1, 077, 342.00

This increase occurred as follows:

Dutiable imports.....	increase..	\$8, 280.00
Gold and silver ore.....	do.....	1, 079, 363.00
		1, 087, 643.00
Bullion and coin.....	decrease..	10, 301.00
Total net increase.....		\$1, 077, 342.00
Duties collected for 1893.....		60, 673. 71
Duties collected for 1892.....		49, 998. 45
Increase for 1893.....		10, 675. 26

It will be observed from this report there has been an increase of imports over that of last year of \$1,077,342 and an increase of duties collected of \$10,675.26.

The border of this customs district to be guarded is 450 miles in length, the line traversing a mountainous and desert country sparsely populated throughout the entire distance. Crossing this line is one railroad and about a dozen wagon roads and innumerable pack trails, besides which there are several long level stretches, over which wagons or pack animals can easily make their way without following any public path. It is an ideal region for smugglers, and that the facilities it offers for the carrying on of clandestine trade are very largely taken advantage of by a lawless border element can not be doubted. To guard this long line but nine inspectors are employed, giving to each an average section of fifty miles in length to protect.

GREATER PROTECTION NEEDED.

It is generally believed that a large amount of illicit trade is carried on at different points along the line. An increased force of line riders would add considerably to the duties, as opium, mescal, sugar, and other foreign commodities are believed to be smuggled to a large extent. It has been frequently found that quantities of opium have been landed at Guaymas. At one time the shipment reached the point of 30,000 pounds. What became of it is not known. It is believed, however, to have been brought into the States via the head waters of the Gulf of California and the Colorado River. Attention is also called to the fact that many Chinese are smuggled through this line. At one time no less than thirty were captured in one batch, and were returned to China at great expense to the Government. From the best information I can gather this illegal traffic is continued without abatement. There is no doubt that the extra amount of customs which would be collected by properly guarding the line would repay many times the cost. The importance of the district can be understood from the increased revenues of last year.

BANKS.

There are five national banks in Arizona and ten private concerns, all save one have withstood the stringency. There are also several prosperous building and loan associations, that in Tucson comparing favorably with any in the eastern cities. The value of money ranges from 8 to 18 per cent per year on good securities. Previous to this year the value ran from 10 to 24 per cent.

STOCK-RAISING.

It is difficult to find an area of country in any part of the world better adapted to pastoral pursuits than the grazing lands of Arizona, situated as they are at a certain elevation above sea level throughout the Territory, for to a climate having no extremes, neither summer nor winter, is added a limestone soil, a good water supply, and an abundance of grasses generously distributed by nature from the banks of the streams in the valleys to the highest peaks of the mountain ranges.

EXTENT AND CHARACTER OF GRAZING AREAS.

The principal grazing areas of Arizona are in Pima, Cochise, Graham, Apache, Coconino, and Yavapai counties, and they vary in elevation above sea level from about 2,500 to 8,000 feet.

The range country in the southern counties of the Territory is one

vast plateau from which rise great mountain ranges parallel to each other, usually with one common trend of north and south.

The valleys that lie between these ranges are in many instances of great extent. The Sulphur Spring, the San Simon, and the Baboquivori valleys appear each as a vast plain; the mountains bordering them, though of great height, are dwarfed by the great space that lies between. Each is the hydrographical basin of an immense section of country.

From the main basin innumerable valleys of varying extent branch out, contracting in the canyons and ravines as they enter the foothills of the mountains.

The great table-lands or mesas leading out in a gradual descent from the mountains, presenting in the distance one level plain, are penetrated in every direction by these valleys, dwindling gradually as they reach higher ground.

The whole country is covered with grass, and is treeless until the foothills and the mountains themselves are reached. Here a forest of live oak with green foliage, summer and winter, commences and extends to the summit of the mountains, devoid of undergrowth, and presenting a park-like appearance. From the timber line at their base to the tops of the highest peaks the grass continues to flourish luxuriantly. The country possessing this character of topography is the paradise of range cattle. The general landscape of the grazing regions of the northern counties of Arizona is in many respects similar to that of the south, except, perhaps, where it approaches great elevations, when it becomes heavily timbered with vast stretches of cedar and pine forests.

RAINFALL.

The average rainfall in these grazing regions of Arizona is from 12 to 16 inches; the chief rainfall of the year takes place between the middle of June and the 1st of October. During the summer months it is usual for heavy rains, accompanied by lightning and thunder, to prevail from day to day in the form of showers, frequently culminating in cloud-bursts that pass over the country, depositing moisture first in the mountain districts and on the high mesa lands, and later on, as the season advances, in the valleys and plains below.

These storms, though tropical in a certain measure in their nature, are rarely destructive of life and property and produce vegetation of all kinds with an astonishing degree of rapidity.

PRINCIPAL FORAGE GRASSES.

The principal forage grasses of Arizona that grow to maturity during the rainy season are the black grama (*Bouteloua erispoda*), to be found principally south of the Gila and Salt rivers; the white grama (*Bouteloua oligostachya*), which predominates in the valleys and on the high table-lands of southern Arizona, and the buffalo grass (*Buchloëdactyloides*), which, while indigenous to many parts of Arizona, is most abundant in the northern counties of the Territory. On the rich bottom lands of southern Arizona, generally in the vicinity of water, it is never seen growing in the open mesa. There is also found the sacaton grasses (*Muhlenbergia distichophylla*), strong and deeply rooted and in some instances of such a height as to hide from view the tallest man. The fresh, tender leaves of this species of grass is much sought after by cat-

tle in early spring, while the seed is eagerly devoured by both horses and cattle in the fall.

Next in value to the grasses named is the Gietta grass (*Hilariamutia*) found growing in bunches and widely distributed throughout southern Arizona in less elevated and more arid parts of the country. There are numerous other grasses that add more or less to the feed on the open ranges of Arizona, but as a rule they are less abundant than the species named.

All of the native grasses contain a large quantity of nutritive matter, many of them even more than the more succulent grasses of the East, and when untouched by frost in the process of curing, or uninjured by excessive moisture after being cured, possess fattening qualities that can not be excelled. The grasses on the open range mature seeds and commence to cure rapidly in the stalk throughout Arizona toward the end of September, which is generally the extreme limit of the rainy season.

In this condition they become the staple food of horses, cattle, and sheep, until it is succeeded by the new crop the following year. The value of the many varieties that are to be found everywhere in the Territory, and the extent to which they can be cultivated, with and without irrigation, and their respective worth when produced, is engaging the attention of the Arizona Agricultural Experiment Station at Tucson, under the capable supervision of Director Frank A. Gully, to whom I am indebted for much information on the subject.

WATER SUPPLY.

The water supply on the ranges exists everywhere throughout the Territory in great abundance during the rainy season.

In the dry season the permanent water courses of the valleys and the springs and smaller streams in the mountains are the main dependence of the cattle owners in the southern part of the Territory. Here it is only in limited localities in the grazing districts that water for the stock has to be obtained in wells by steam power or windmills. In northern Arizona, however, in addition to having the permanent water courses and wells as the water supply, large reservoirs have been created, with a most satisfactory result, to catch the storm floods during the rainy season and the water from the melting snows in the spring.

This system of water supply for grazing purposes will probably be utilized more in time in other parts of the Territory.

The value of a cattle range consists not only in the quantity and the quality of the grass and browse it possesses, but also in its proximity to water. The nearer the feed and water are together, or can be brought together by artificial means, in an equal proportion, the more is a ranch and its belongings enhanced in value.

Much private capital has been expended in Arizona to this end, but there are still many ranges where cattle at certain periods of the year have to travel great distances from the feed to water; and during a scarcity of feed in the dry season this fact has been a fruitful source of great mortality among the weaker classes of cattle, such as old cows and both young and old cows with sucking calves.

UNFAVORABLE CONDITIONS OF THE LAST TWO YEARS.

The cattle industry of Arizona during the last two years has shared all the terrible privations that the industry has had to bear throughout the Union, caused by the ruinous shrinkage of values, and in addition thereto it has had heavy burdens to experience in meeting local casualties due to a destructive drouth and overstocking the ranges, which there appeared to be no possibility of avoiding, even by those possessing capital and thorough knowledge of the business.

The completion of two transcontinental railways through northern and southern Arizona in 1880 and 1881 suddenly opened up indirect communication with the great cattle markets of the country a vast grazing region in Arizona, untouched and of unsurpassed excellence, and the opportunity was seized by eager capitalists, both at home and abroad, to invest their capital with ill-judged haste in the new El Dorado. Thousands of cattle immediately subsequent to the completion of these lines were imported into the Territory from Mexico and from Utah and Texas. For some years, with virgin pastures, the 3 and 4-year-old steers were turned off in large numbers every fall from the ranges, soon after the expiration of the rainy season, and disposed of in the local markets and in California as prime beef, bringing profitable prices, and the business greatly prospered. As the herds increased, however, through importations and through their own offspring, the grass supply soon diminished throughout the Territory to such an extent that it was impossible to mature prime beef any longer on the open ranges, and the cattle owners were forced, at great pecuniary sacrifices in most instances, to sell their steers as feeders at greatly reduced prices to buyers from California, Montana, and Kansas.

SHIPMENTS OUT OF THE TERRITORY.

The steers from 2 to 5 years old, as recently as last spring, have been purchased by thousands and shipped to these States at considerable profit to the middleman, and are there to be matured for market. The cattle owners, realizing that the ranges were dangerously overstocked and much loss in various ways was directly due to overcrowding, have made an earnest effort during the past two years to relieve them of every class of cattle that could bear shipment.

While I have no accurate data at hand giving the exact number of cattle shipped, it is estimated that over 200,000 head, consisting of all classes, were shipped from Arizona to California, Nevada, Montana, Kansas, Nebraska, and Texas during the year ending June 30, 1893.

The severe drought that has prevailed in consequence of a greatly diminished rainfall during the last two rainy seasons has served to hasten these shipments and greatly add to the number of cattle sent away. Such has been the shrinkage however in the value of certain classes of cattle that the price received for them did not permit their owners to incur the financial risk of relieving their ranges to the extent that was desirable to escape disaster, even though the railroads penetrating the Territory made special rates "for starving cattle," and a serious loss has been thus experienced in every county of the Territory during the past year, due primarily, it is true, to the drought and overcrowding, but which the low price of cattle and the heavy cost of marketing them gave absolutely no relief from.

NUMBER AND VALUE OF CATTLE ASSESSED IN THE TERRITORY 1883 TO 1893.

I submit tabulated statements below that give the number and value of the live stock of the Territory as rendered by the counties to the Territorial Board of Equalization each year since 1883 to 1893 :

Cattle.

Counties.	1883.		1884.		1885.		1886.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Apache.....	14,700	\$147,000	(*)	-----	24,274	\$333,355	38,461	\$485,784
Cochise.....	(*)	-----	33,605	\$415,865	-----	692,628	60,492	708,886
Gila.....	7,257	131,150	8,497	160,881	9,450	162,939	15,970	201,389
Graham.....	10,088	176,540	17,167	307,984	22,086	339,629	29,217	444,542
Maricopa.....	4,481	55,772	5,974	98,740	7,680	127,679	9,586	147,832
Mohave.....	9,537	145,342	9,850	147,765	14,218	213,270	15,556	205,988
Pima.....	57,600	864,000	80,000	1,200,000	70,000	885,000	66,500	764,750
Pinal.....	14,281	251,135	21,513	Not val.	28,383	434,116	28,566	335,696
Yavapai.....	49,132	608,304	64,008	832,104	89,688	1,030,512	116,286	1,279,146
Yuma.....	1,897	18,713	2,066	22,660	2,030	19,097	3,111	34,681
Total	168,973	2,397,956	242,680	3,185,999	267,899	4,238,225	383,745	4,608,694

Counties.	1882.		1888.		1889.		1896.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Apache.....	54,297	\$649,484	65,472	\$699,878.94	(*)	-----	68,927	\$585,897.50
Cochise.....	73,285	879,420	73,294	769,587.00	94,021	\$819,863.12	83,792	691,041.42
Gila.....	17,101	205,528	19,984	201,196.00	42,282	431,914.00	49,733	452,645.10
Graham.....	37,089	491,767	45,541	478,180.50	36,855	375,180.00	55,623	507,438.00
Maricopa.....	9,505	124,237	12,698	167,893.00	15,514	223,808.00	23,843	231,065.30
Mohave.....	23,172	281,808	20,752	254,212.00	22,317	280,067.75	24,020	221,612.00
Pima.....	83,234	999,892	94,734	1,012,290.00	109,206	952,961.50	113,974	885,280.50
Pinal.....	34,386	408,785	31,460	330,554.70	39,347	401,432.00	40,032	348,399.00
Yavapai.....	181,259	1,608,552	145,058	1,710,323.00	159,773	2,005,151.15	172,627	1,370,814.50
Yuma.....	3,510	41,992	3,340	35,411.00	3,378	29,456.16	3,445	27,630.00
Total	466,838	5,691,467	512,338	5,720,526.14	522,747	5,519,833.68	636,016	5,321,823.32

Counties.	1891.		1892.		1893.	
	Number.	Value.	Number.	Value.	Number.	Value.
Apache.....	74,132	\$630,112.00	49,314	\$480,078.00	39,933	\$310,202.06
Cochise.....	95,850	756,992.25	82,122	647,075.00	45,056	316,426.00
Coconino.....	55,062	405,825.00	58,428	408,803.00	51,315	398,081.07
Gila.....	58,645	496,470.45	55,828	451,630.09	53,952	405,202.58
Graham.....	66,730	585,718.50	68,526	620,044.00	64,800	489,583.85
Maricopa.....	26,509	254,350.95	24,506	230,925.00	22,974	235,274.60
Mohave.....	29,360	252,155.00	28,572	210,096.00	26,811	200,835.79
Pima.....	121,377	960,892.12	116,604	852,097.00	49,599	347,542.77
Pinal.....	48,565	493,551.78	85,102	254,747.00	27,002	203,562.71
Yavapai.....	142,460	1,205,057.70	121,392	853,562.00	107,018	802,228.22
Yuma.....	2,250	19,461.60	3,815	38,150.00	3,352	34,203.00
Total	720,940	5,970,587.35	644,209	5,047,207.00	491,812	3,742,936.65

*No return.

ADVANTAGES OF EXPERIENCE TO THE FUTURE OF THE BUSINESS.

While the item of live stock adds in a very material degree to the assessable values of most of the counties of the Territory, and their serious falling off in this direction in certain counties, as shown above, may perhaps temporarily embarrass for a few years two or three of the county governments in raising the customary revenue, the decrease, though an unfortunate thing as an investment to the individual, will

not be without benefit to the Territory as a whole and even to the industry itself.

A trying experience has taught the cattle owners of Arizona many things that will be of value to them in their business in the future. They invested their capital in a country that was new to the American; they had much to learn by their own personal observations and by their own personal experiences.

Such is the history of the cattle industry of every new country in its experimental stage. But it has now passed that stage in Arizona, and will advance hereafter on a more secure footing, avoiding the mistakes of the past. It has been clearly demonstrated, for example, that with the most favorable seasons the best ranges will only carry a reasonable number of cattle, and that overcrowding not only destroys the grasses, but that the cattle themselves, in spite of great care in breeding, deteriorate rapidly in physical development with scarcity of feed. The calf, unable to acquire a proper degree of nourishment from an improperly fed mother, advances to the state of a yearling undeveloped and rough, and possesses the same disadvantages when he enters the market as a steer, and is an objectionable and unsatisfactory commodity to both prepare for the market and to sell. There will be better grades of cattle grown in the future, and much more attention will be paid to quality. The business will not be conducted so loosely as in the past; more conservative methods will be adopted and less risks taken. Those who had no knowledge of the business and entered it, for the time being, for purely speculative purposes have been weeded out. There are reduced freight rates on the railroads, and many other advantages of an encouraging nature I might name that have their value.

PRESENT RANGE CONDITIONS.

All reports of the Signal Service regarding the rains this summer up to the present are concurrent "That the meteorological conditions have been unusually favorable to all interests affected. The ranges are already in excellent shape in nearly all sections, and in some districts are reported as being in better condition than they have been before in many years. Cattle are fattening rapidly, and the outlook with reference to live stock interests throughout the Territory has undergone great improvement since the advent of the rainy season."

In nearly all districts, owing to overstocking, many weeds have taken the place of the best grasses. In other places where ten years ago the end of the wet season would find a rich growth of grass, now it is of inferior quality, of less quantity, or does not exist at all. This injury to the range, however, is not regarded as permanent. With the decrease of cattle now noticeable everywhere a few favorable seasons, it is thought, will replace the grasses that have disappeared.

BREEDING AND INCREASE.

The system of the handling of cattle on the ranges in Arizona is similar to that of all the western States. Except when the condition of the cattle does not permit it, public round-ups are held both in the spring and fall. It is upon these occasions that the increase of the herds is branded and the steers are gathered for market. There is no extreme cold in southern Arizona and very little in northern Arizona save for a short period during midwinter in the most elevated portions of Yavapai and Coconino counties. There is no part of the Territory

where cattle can not be gathered any month of the year off the ranges Arizona is exempt from blizzards and entirely free from all contagious diseases among cattle. Since 1880 rapid strides have been made in the improvements of the herds of the Territory. At that time about the only cattle here were those of the Mexican or Spanish origin. The first improvement made was the introduction of the Shorthorn; but the great and noticeable improvement has been made by the introduction of the Herefords, they being essentially grass-fattening animals, and finding themselves at home upon every condition of mesa, mountain, and valley range. Experiment having proven them superior in every desirable quality, they are being introduced on all ranges as fast as possible. Before the ranges were eaten out, from the combined effect of drought and overstocking, accurate accounts upon the largest ranches showed a yield of from 90 to 95 per cent, counting 2-year old heifers as producers, while last year these same ranches produced only 10 per cent, and it is estimated that the yield this year will not be over 5 per cent. As a breeding country Arizona can not be excelled. Owing to the low price of cattle there has been some tendency in the northern counties to substitute cattle for sheep on the open ranges. It is only however in a limited portion of the Territory where a change of this sort is anticipated.

LEGAL TENURE TO GRAZING LANDS WANTED.

The cattle industry must always remain one of the great industries of the Territory; those engaged in it are among the most intelligent and deserving citizens we have, and I would recommend the enactment of such laws by Congress as will secure to all stockmen on the public domain legal tenure of the lands they use, at the same time guarding against any monopoly. A large portion of the Territory consists of dry mesas which have been used as stock ranges from the first settlement of the country and must be so used for years to come. At very small expense the land department of the Government could segregate these lands, suitable only for pasture, from the valleys and fertile mesas, after which being done, they could be leased to the stockmen, who, consulting their own interests, would never overstock them.

SALT AND GILA RIVER VALLEYS AS FEEDING POINTS.

Cattle-raisers have had within the past few years their attention called to the Salt River Valley, in the vicinity of Phoenix, as a favorable point for maturing steers, instead of having to depend as they do now, on the pastures of Kansas, Montana, and California. Alfalfa or lucerne is raised in the Salt River Valley in great quantities, and its fattening qualities in preparing range cattle for market have been fully tested, not only here but through California as well as in Nevada. At Reno and Lovelocks in Nevada thousands of range cattle are fattened each year on alfalfa for the San Francisco market, and the business has been eminently successful. As yet for various reasons it has not been attempted on so large a scale at Phoenix, although it is estimated that not less than 50,000 acres of alfalfa are now planted in the Salt River Valley, capable of producing 250,000 tons of hay per annum. Many range cattle of late years have been fattened in this valley and the annual demand for pasturage is increasing. Owing to the warm and dry winters in the Salt and Gila river valleys no shelter is

required for cattle, and this fact, united with many favorable conditions that exist in these valleys for feeding cattle will eventually enable them to compete successfully as feeding points with those of Nevada and California as well as those of the Eastern States. I quote the following on stock feeding from Bulletin No. 8, issued in March of the present year by Messrs. Gulley and Moss of the agricultural experiment station:

For several years the writer was engaged in winter cattle feeding in Michigan where the staple foods were corn and hay; after that time, for seven years in Mississippi in handling a large dairy herd and fattening beeves, where a series of experiments were made to determine the food values of cotton seed. These experiments were continued in Texas in 1889 and 1890. During these years the work of the distillery and other feeders in the Northern States and the extensive work of the cotton seed hull and meal feeders in the South was frequently inspected. With this general knowledge of the facilities for feeding cattle over a considerable part of the country, it would seem to me that we have in Arizona certain favorable conditions for feeding cattle that will enable us to compete successfully with cattle men of other States. First, we have warm and dry winters; no shelter is required. Secondly, in alfalfa and sorghum we have two crops that supply a nutritious cattle food for the growth of which our climate is specially adapted, and they may be grown at a cost that will enable us to produce beef at a minimum expense compared with other sections of the country. * * * From 2 to 2½ pounds gain per day for one hundred days is a good gain for average 1000-pound steers fed on hay and corn in the Central States, and we are confident that this increase may be nearly made with selected range steers fed on our sorghum and alfalfa, if they can be "broken" to eat and to feed quietly after placing in the yards.

LIVE-STOCK SANITARY COMMISSION.

When cattle are brought together in such large numbers as they are in the Salt River Valley the most vigilant care has to be exercised against the outbreak of any contagious disease. Fortunately the Territory has, under the provisions of the law, a well-organized live-stock sanitary commission, composed of some of the most intelligent and experienced cattle men of the Territory and a capable veterinary surgeon. Their duties are to have under strict supervision the health of all the live stock throughout the Territory, to see that the quarantine regulations that govern the importation of cattle into the Territory from Mexico and the States of the Union are enforced, and to have inspected the brands of all cattle shipped or driven from the Territory, as well as to always take the proper measures to protect the best interests of the cattle industry of the Territory wherever they seem to be jeopardized beyond the borders of Arizona by unjust discrimination or unjust laws of other States. The creation of this live-stock board by the legislature gave great satisfaction to the cattle men of the Territory; and the presence of an organized body of cattle men to jealously guard the best interests of the industry has done away with the necessity of stockmen banding themselves together into cattle associations, and these, so numerous at one time, have nearly ceased to exist.

SHEEP-RAISING.

Much more attention has been given in Arizona to raising cattle than to any other kind of stock. Sheep-raising, however, is rapidly on the increase in the northern part of the Territory.

The industry has been confined principally to those counties in the higher altitudes of the Territory, and wherever introduced has been extremely profitable. Experience goes to show that on the ranges of the southern counties, with different grasses and a warmer climate, it

is less profitable. The number of sheep within the borders of this Territory is stated to be, on the best authority, in round numbers, about two millions, including the sheep owned by the Navajo Indians. Flocks of brood ewes have increased during the past year from 75 to 90 per cent.

Merino sheep produce about 8 pounds of wool per head annually, and command a market price of \$3 each.

Mexican sheep, or coarse wool-shearers, yield about 4 pounds of wool per head annually, and bring about \$1.50 a head.

The annual wool clip of the Territory will aggregate about 10,000,000 pounds.

The high mountains of Arizona for summer and low valleys for winter are similar to those of France and Spain, where developed the original fine-wool sheep. Our fine wools when scoured compete successfully with the best Ohio and Australian wools.

Many train loads of mutton sheep have been shipped to the feeding grounds in the Mississippi Valley to be prepared for the Kansas City and Chicago markets, and sold at a price of from \$5 to \$6 per head. It is a significant fact that while there has been a heavy loss and a decrease of cattle during the drought of the last two years the sheep in Arizona have increased in numbers.

MINING.

During the last seventeen years Arizona has produced gold, silver, and copper to the value of \$94,293,648, which places her among the leading mineral regions of the United States. It was not till 1876 that mining could be said to have been inaugurated in the Territory. In that year \$336,564 worth of silver bullion was produced. The industry rapidly developed, until in 1881 the silver bullion shipped from our mines by the Wells Fargo Express Company amounted to \$6,278,893, and the total product of gold, silver, and copper for the following year reached \$9,298,267, the highest point ever attained. The rapid decline in the price of silver during the last three years resulted in the closing of nearly all of our silver mines, reducing the output for last year to \$287,426, while the value of the total product of metals (including copper in ores) shipped for treatment was \$6,782,607. Thus it will be seen the falling off in the silver output has been, in a measure, made up by the increased production of copper.

Of the copper companies producing in the Territory five gave an output for the year of 38,712,507 pounds. During the past six months there has been a marked movement in prospecting and mining for gold, with such favorable results that it is reasonably certain the output for the year will be \$6,000,000. It is interesting to note the development of Arizona's mineral resources during the last seventeen years. This is shown by the following tabulated statement prepared from the report of John J. Valentine, president of the Wells Fargo Express Company:

Arizona's bullion output for seventeen years.

Year.	Gold dust and bullion by express.	Gold dust and bullion by other conveyances.	Silver bullion by express.	Ores and base bullion by freight.	Total.
1876	\$103,528		\$336,564	\$671,900	\$1,111,992
1877	122,867		506,549	1,759,206	2,388,622
1878	199,911	\$19,911	1,116,606	951,555	2,287,983
1879	212,722	21,272	1,046,036	662,373	1,942,403
1880	159,970	80,000	2,830,449	1,402,052	4,472,471
1881	396,697	132,332	6,278,895	1,390,942	8,198,766
1882	386,517	100,000	5,631,083	3,180,667	9,298,267
1883	340,686	150,000	4,147,427	3,545,630	8,183,743
1884	360,791	100,000	3,139,628	3,455,690	7,056,319
1885	726,426	120,000	2,752,068	2,996,652	6,595,146
1886	583,827	100,000	1,371,083	4,048,468	6,103,378
1887	680,545	200,000	1,073,985	3,817,020	5,771,550
1888	712,600	100,000	850,798	3,460,470	5,123,868
1889	922,861	50,000	611,666	4,218,500	5,803,027
1890	1,050,486	100,000	683,565	5,763,298	7,597,349
1891	759,132	100,000	521,344	4,195,681	5,576,157
1892	787,505	215,000	287,426	5,492,676	6,782,607
Total					94,293,648

MINERAL RESOURCES.

As to the mineral wealth of Arizona probably no person is better qualified to speak understandingly than the director of the Arizona School of Mines, Dr. Theo. B. Comstock, who is also the president of the University of Arizona, at Tucson. The following is quoted without change from a statement furnished by him at my request. He writes:

The remarkable output of a few wonderful mines some years ago gave prestige to Arizona, and the sudden stoppage of dividends, through mismanagement and ignorance of the facts, has turned away capital which certainly would have earned as much here in legitimate mining as it has brought to its owners elsewhere in the meantime. The inference drawn from the commercial history of the Bonanza mine was what might have been expected, no doubt, but that it was erroneous and unbusiness like is most clearly proved by the sequel. It is a very common thing for investors who too freely place their capital where they can not or do not watch its manipulation to console themselves for its loss by wholesale condemnation of the investment and all of its class.

If we throw out certain barefaced swindles, which no sensible honest man could have regarded as legitimate after very moderate investigation, there remain only two or three districts which have formed the basis of the adverse judgment which has been passed upon Arizona's mines in some influential financial quarters. Probably the real foundation for the idea with which I was fully imbued when I came to this Territory might be traced to the record of the Silver King and one or two of the Tombstone properties, notably the Tombstone Mining and Milling Company's holdings. From the early experience of these we were all led to judge that the whole aggregate of the ores of gold and silver in Arizona was merely superficial, though enormously rich.

Were such conclusions warranted by the facts, even in the cases cited, there is no doubt that the proper handling of such deposits both at the mines and in the home offices would be among the most profitable of industries under reasonably favorable conditions of the metal markets. But the truth is, the facts do not all justify the conclusions. The recent workings of these same veins afford ample evidence of their permanent and deep-seated character, and my careful examination of a very large number of mines all over the Territory enables me to state positively that our deposits of both gold and silver ores are not excelled by those of any other region. In many respects, considering the advantage of climate, favorable exposure, and the high grade of the output, the outlook for the mining industry in Arizona is unequaled anywhere. The character of the ores has changed below the zone of surface action, but the quantity does not ordinarily show signs of diminution.

SILVER AND GOLD.

The present condition of the silver mines is, of course, not very encouraging, but even this important branch of our industries is suffering less than in other regions

because of the greater security provided by the richness of the deposits. There must be eventually a stoppage of silver mining here, as elsewhere, if no improvement occurs in the price of the metal; but Arizona mines in many localities, if understandingly worked, will be able to withstand vicissitudes which would ruin those less favorably situated.

Our supplies of gold-bearing ores have not heretofore been adequately appreciated, owing to the productiveness of the silver ores, and on account of the free-milling character of such deposits at the surface. The change in character of these ores as depth has been attained, and the downward fluctuations in the price of silver, have compelled attention to the auriferous veins, which really form the staple supply of our great mineral wealth. In other regions, for the most part, the gold product has been largely obtained in connection with the treatment of ores of silver. In Arizona, although there is an abundant harvest to be won from the proper working of the immense deposits of silver-bearing minerals, it is probable that the full development of the gold veins would result in an increased production rivaling that of the palmiest days of California.

The whole of the mountainous area of southern Arizona is highly auriferous, and the gold belt extends in bands across the Territory. The veins are remarkable for their great width and for the depths to which the metal extends in a free condition. The ores are usually brittle and easily worked, yielding a very small percentage of waste material, often actually none at all. Among the notably successful mines of the main belt may be named the Mammoth, of Pinal County, which has been returning large dividends to its English stockholders; the recently worked Mammoth of the Superstition Mountains, in Maricopa County, one of the most promising properties yet discovered; the wonderfully rich mines of the famous Harqua Hala district; the telluride veins in the vicinity of the Antelopes, in Pinal County; the less advertised but very profitable workings of private owners near Yuma; numerous veins which are beginning to make a favorable record in Pima County, especially near Oro Blanco and in the neighboring country; a large number of rich and easily worked deposits in the northern counties of Mohave, Yavapai, and Coconino; the Congress, Crowned King, Gladiator, Model, Roach, and other mines yielding rich sulphides which can be very profitably concentrated. The White Hills district in Mohave County, the Walnut Grove district in Yavapai, are among the best of the gold-bearing areas. In Maricopa County the Vulture, Union, Yarnell, and Phoenix mines are representatives of a class of valuable gold-producers with a pyritous product. These last may require some skill in the treatment, but they present no difficulties of workings beyond the reach of well-trained metallurgists. Cochise County has a number of mines which yield notable quantities of gold in ores which have heretofore been marketed also for their silver contents.

In all parts of the Territory where minerals exist there will be found valuable deposits of gold-bearing ores. These will form a large and increasing portion of the productive wealth of Arizona, although the mining industry must materially change in character if the degradation of silver is to continue. It is doubtful if even the miners, as a class, fully realize what is patent to all metallurgists, namely, that heretofore the treatment of the bulk of the ores carrying gold have been very closely linked with reduction of the ores of silver and lead. Consequently the growth of an important gold-mining industry in the Territory in future will be materially influenced in character by the status of the other metals, notwithstanding the undoubted ability of many of the gold mines to stand independently if need be.

Rich gold placers cover areas of considerable extent in Pima and other counties. Very large sums have been realized from nugget grains obtained by crude methods in the Santa Rita Mountains and the Quijotoa district. Scarcity of water has prevented thorough work, but there seems good reason to anticipate large and steady remuneration with capital judiciously invested in modern appliances and in the storage of water, which is abundant enough in the rainy season.

The silver producers in Arizona are, with very few exceptions, now lying idle. None are shipping, unless the proportion of gold is large enough to justify working for that metal alone. There is a vast number of properties yielding silver, which were profitably worked when silver commanded a good price in the market; the stoppage of these has seriously damaged the business of the mining centers which was very closely identified with their prosperity.

COPPER.

In copper production Arizona stands third among the States and Territories. The output for the year 1892 was 38,000,000 pounds, being the largest product for any one year, except 1891. It is well known that this diminution was wholly due to the market conditions, and not to the natural incapacity of the mines. The product in 1893 as well as in 1892 was also purposely curtailed by agreement among the producers. We have great advantages over all other domestic sources of supply in the

richness and docility of the ores, which have been chiefly oxidized minerals. Now, some of the hard-worked miners have begun to consider the necessity of treating the sulphides from the deeper level; but the cost of producing copper, even with all the disadvantages of an undeveloped country, has compared most favorably with competing districts.

The Copper Queen mine, at Bisbee, Cochise County, has been the largest producer, followed closely by the United Verde, of Jerome, Yavapai County; then, in order, by the Old Dominion, of Globe, Gila County, the Arizona Company, of Clifton, Graham County, the Holbrook and Cave, of Bisbee, and the Detroit, of Globe (not working in 1893). The unworked districts contain deposits which experts regard as equal in value to those which have been already worked. There is good reason to believe that Arizona will maintain at least her present rank as a copper producer for many years to come. The quality of the bullion is second only to the unapproachable Lake brand itself.

LEAD.

The amount of lead credited to Arizona in 1892 was only 2,000 tons, or less than 1 per cent of the total production in the United States; but when it is considered that every pound of our output was argentiferous and mined as silver ore, it will be seen how important this metal becomes as a factor in the business depression following the drop in the latter. Moreover, a very large percentage of the low-grade ores of the Territory are the most desirable varieties of galena, suitable only for smelting. The stoppage of the silver mines has effectually prevented the raising of any of this material. Without going into details, it must be evident to all discerning minds that the future development of both the lead and silver interests of Arizona will eventually demand the reduction of the ores at home in large degree. Fortunately, we are liberally provided with stores of dry silver ores to mix with the low-grade lead mineral, and investigation proves that our Territory is richly endowed with the material for fluxes.

IRON.

Iron ores are of less immediate interest to us, but it is interesting as affecting the future progress of this region to note the appearance of extensive and exceedingly valuable deposits of workable material of this class. Meteorites have apparently fallen in such quantities in the past as to make fragments of them a noticeable constituent of the sands in certain localities. We have enormous areas in which magnetic ore abounds, while hematite and limonites are abundant in many places. These iron ores occur usually in proximity to the limestones and in situations well disposed for economical working. There can be no doubt that the Territory has within itself all the requisites for building up a successful iron industry when once the proper artificial conditions of transportation are established.

OTHER MINERALS.

Manganese ores occur abundantly. These have been repeatedly sent in to the School of Mines for identification, and some of them bear evidence of great commercial value. They vary in quality and composition, and it is impossible to speak explicitly as to the extent of the deposits, which I have not been able to critically examine in many instances. Judging from the associated rocks and from such hints as are reliable criteria, there would seem to be much hope of obtaining these ores in large masses. Such material will some day play an important part in the reduction of certain classes of silver ores which abound in Arizona. Notable instances of their occurrence in the mines of silver ores are the Lucky Cuss, of Tombstone, and the Reymert, northwest of Florence, and others contain manganese in workable quantities.

I have detected nickel and cobalt in percentages high enough to make it profitable enough that these metals may become important commercial products of Arizona. As yet they have only been observed in connection with other ores in proportions which will not prove remunerative without concentration.

Graphite deposits of commercial extent have not been reported, but there are some localities which expose altered coal beds, much metamorphosed, having the qualities of impure plumbago.

Zinc blende is abundant in particular districts. This mineral is not as common as a contamination of galena veins as in some parts of the country, but it occurs in quantity in certain belts, usually more or less specialized in distribution.

PRECIOUS STONES.

Among minerals classed as precious stones we have mined turquoise and opals, agatized wood, and a little tourmaline. The greatest interest has attached to the

onyx deposits of Yavapai County, from which large revenues have been earned, with no prospect of early exhaustion. The product of the Big Bug quarries is of excellent quality, comparing favorably with the best of the Mexican output. This mineral is not confined to that region; good specimens have been sent from other counties, but no capital has been applied to their development.

COMMON MINERALS.

Arizona is rich in the more common minerals employed in the arts. Asbestos of good quality exists in several localities; mica occurs in marketable grades, although little effort has been made to mine it; large deposits of material suitable for the manufacture of natural and artificial hydraulic cements are known, but not yet utilized for lack of markets and transportation; porcelain clays and clays adapted for brick and tile are largely deposited; feldspar is also abundant in places; talc and talcose minerals may be obtained in localities soon to have the benefit of cheap freight, and it is very probable that important additions to the list of economic minerals will be made when more thorough prospecting has been done in all parts of the Territory. Some very promising samples of lithographic limestone have come under my notice.

FUEL.

The fuel problem has not yet assumed a serious aspect, nor will it trouble much while our extensive forests last. We have assurance of cheap coal from Mexico at no distant day, and there is a hope that our own deposits may prove of more value than has been expected. We need more and better facilities for transportation and more reliance upon home treatment of our ores and mineral products.

WATER SUPPLY.

The question of water supply has heretofore been handled most superficially, and I deem it proper to speak of my investigations as far as they have gone. There is really a much larger supply of water below the surface than is known, even by our own citizens. Practically nothing has been done to develop this source of wealth. The experiments already made prove that very much can be raised from a reasonable depth, but it is all-important that deep boring should be tried to test the underlying structure in order to understand what may be expected over wide areas. A thorough geological survey is imperative. The work could be performed well under the auspices of the School of Mines were funds available for the purpose.

Whether it be possible to obtain a supply of water from artesian wells is a question which involves a knowledge of structure, which can only be acquired by careful instrumental surveys. Prof. J. F. Blandy, who has given the subject much attention, informs me that he is gradually becoming more sanguine of success in this particular. My own observations are less conclusive because less extended, but such facts as have been gleaned are cheerfully confirmatory of this idea. I am convinced that deep boring, as an experiment, would be wholly justifiable at many points over a wide area in the desert tracts. But I must protest against any interpretation of my words to imply the probable success of such enterprises in the highlands adjoining the more prominent mountain ranges. It is rather in the lowland plains, especially of Southwestern Arizona, that the conditions are presumably favorable.

BUILDING MATERIAL.

Building materials of the best quality occur in profusion in Arizona. We have excellent limestone, both for construction and for the manufacture of quicklime. Many of the volcanic rocks work easily and can be dressed when required. Sandstones of rich color are obtained in the northern counties.

FORESTS AND LUMBER.

The timber region of the Territory is chiefly located in the northern and central portion of Arizona, and covers an area of about 2,750 square miles. The high mountain ranges of the south and eastern portions of the Territory are also very liberally timbered. Pine wood is generally found at altitudes of from 5,000 to 10,000 feet. Below this

line the timber runs into juniper, live oak, mesquite, and palo verde. The two last named supply the fuel of the Territory. It is estimated that the total quantity of pine timber fit for commercial purposes is 10,000 million feet. This, however, is chiefly located in the northern and central portions of Arizona, and will be of little service to the southern section until rail communications are completed. At present the lumber for this section is supplied by California and Oregon, at prices varying from \$30 to \$60 per 1,000 feet, the high price being due to the cost of transportation. The value of the merchantable lumber in the pine forests of the north, where the output ranges from 10,000,000 to 12,000,000 feet annually, runs from \$12 to \$15 per 1,000 feet.

With reference to the output during the past year and suggestions relative to our forests, I would commend the following from the president of the Arizona Lumber Company, who is an accepted authority on the subject of which he treats:

In my judgment the lumber production of Arizona during the year ending June 30, 1893, would amount to about 24,000,000 feet. I base this estimate upon the knowledge of what our neighbors at Williams and Challender are doing and also upon the closest possible information that I can get as to the output of the small sawmills in other parts of the Territory. For these last, however, I have to depend largely upon hearsay, but I am satisfied, nevertheless, that it is a very close approximation.

I do not know of any suggestion that I could make as to legislation for the benefit of this industry; but I believe that it is the duty of every person who can give the matter thought at all, and who is in position to influence anyone's action in the premises, to make some endeavor to perpetuate our forest conditions for the benefit of future generations in the Territory. Upon the reasonable preservation of our forests will depend the happiness and welfare, and I may say the absolute existence, of any large population in this Territory; and the time to act is the present, when the least possible injury will be done to vested rights. I believe the Government ought to withdraw all timber lands it possesses in the Territory and ought to appoint a competent forester who would make it his sole duty to see that the covering which nature has afforded our mountain top should be preserved, to the end that the valley land of the Territory would be protected either from drought or flood in the years to come. The ordinary lumberman cares simply to cut and slash, and usually his only measurement of the value of a tree is, how many feet of lumber it will make and how quickly it can be converted into money. But I contend that we have a duty to posterity, and that even the mad scramble for immediate gain in which most of us are indulging should in some measure be so guided as not to inure to the positive injury of those who are to come after us, as I believe it is now doing. The American Forestry Association has prepared a bill looking to wise conservation of existing forest conditions and the increase of the tree covering of our mountains, where more or less devastation has already taken place; and I believe if every person who cares about these things throughout the country would give such support to it as their position will admit, it would tend to put into effect the best experience of other nations as well as our own, and without working a single particle of injury to anybody concerned.

EDUCATION.

Arizona's public-school system was established in 1871, and is fully abreast of the most advanced American ideas on this subject. The progress of the schools since their inauguration shows how firmly rooted is the idea of public education in the mind of the people. With the conquest of the different sections of the Territory they sow its seeds as readily as they plant corn and the vine.

The following tabulated statement, prepared by Prof. F. J. Netherton superintendent of public instruction, may be taken as correct:

Counties.	Number of children of school age at last census.	Average length of term.	Average salary.	Total amount paid in salaries.	Total expenditures.	Value of school property.
		<i>Months.</i>				
Mojave	244	8½	\$75.80	\$7,295.00	\$8,536.34	\$5,170.00
Graham	1,930	5½	73.00	9,080.00	11,162.23	13,613.00
Maricopa	3,494	6½	81.00	27,662.00	61,323.53	132,524.00
Pinal	882	6½	84.00	7,882.00	10,132.41	19,270.50
Gila	548	6½	74.00	7,596.00	8,595.74	3,855.00
Cochise	1,310	6	77.00	16,756.00	21,389.24	25,899.99
Coconino	504	6	92.50	4,733.00	7,325.34	(*)
Pima	3,265	6½	78.70	21,434.50	26,738.61	75,251.00
Yuma	516	(†)	92.50	3,354.75	4,332.30	(*)
Apache	1,506	6	73.25	11,653.00	17,215.24	10,750.00
Yavapai	1,264	6½	75.00	23,265.41	29,059.91	43,080.00
Total	15,463	6½	79.77	140,712.21	205,810.89	329,419.49

* Not valued.

† Not given.

Counties.	Number of teachers.	Number of school districts.	Number of boys enrolled.	Number of girls enrolled.	Total enrollment.	Number of children attending private school.	Number attending denominational school.
Mojava	12	12	90	93	183	9	
Graham	25	20	525	449	974	15	4
Maricopa	64	41	1,400	1,201	2,601	193	10
Pinal	9	7	269	278	547	117	
Gila	18	16	250	187	437	15	4
Cochise	30	22	588	487	1,075	34	5
Coconino	8	6	137	130	267	6	6
Pima	35	24	874	681	1,555	552	
Yuma	9	8	111	71	182	94	
Apache	26	20	554	586	1,140	54	31
Yavapai	39	38	535	501	1,036	31	68
Total	275	214	5,333	4,664	9,997	1,120	128

Last year there were 275 teachers employed in the public schools of the Territory, on an average of six and a half months, at an average salary of \$79.77 per month. There are 214 school districts with 15,463 children of school age, of which 9,997 are enrolled on the school list. The total amount paid in salaries was \$140,712.21, and the total expenditure of maintaining the schools for the year was \$205,810. The total value of school property is \$329,419.49. I doubt if a better showing can be made by any State or Territory in the Union.

There is a number of schools also conducted by religious bodies. There are in Catholic academies and parochial schools 600 pupils and 25 teachers, the latter composed of the Sisters of St. Joseph, of Carondelet, and of Mercy. The amount expended in the conducting of these schools is about \$6,000.

There is also an academy at Nogales, conducted by the South Methodist Church and a number of minor religious educational institutions throughout the Territory, so that it will be observed the religious forces are not idle in the education of the young.

NORMAL SCHOOL.

The Territorial normal school was established eight years ago at Tempe, for the purpose of training home talent to be utilized in teach-

ing in our public schools. The curriculum is similar to that of such schools in the respective States. It embraces a graduating course of three years.

The attendance has steadily increased since its establishment. There are now three instructors employed. The last legislature provided for the erection of additional buildings; also by direct tax provided for other necessary improvements. The normal school is now firmly established, and has become one of the best equipped institutions of its kind in the country. It gives to the Territory annually a new corps of most excellent teachers.

TERRITORIAL UNIVERSITY.

The University of Arizona was created by act of the Territorial legislature of 1885, which provided for its location at Tucson. The building was completed and the university opened October 1, 1891. The value of its grounds, buildings, and equipment is \$90,665. The university is under the control of a board of regents appointed by the governor, the secretary of the Territory and the superintendent of public instruction being *ex-officio* members of the board. The endowment now available for educational purposes consists of two separate funds, as follows: First, the territorial tax of about \$4,500, to pay interest on bonds pledged to the university, annually levied, available for building and general purposes. Second, the college appropriation from the National Congress, increasing annually from \$15,000 to \$19,000 for the year 1893-'94, with provisions for a continued yearly increase of \$1,000 until it becomes \$25,000 annually, restricted to use for salaries and equipment. The enactment establishing the university provides that it shall consist of five departments: First, the department of literature, science, and arts. Second, the department of theory and practice and elementary instruction. Third, the department of agriculture. Fourth, the normal department. Fifth, the department of mineralogy and the school of mines.

With adequate provision for instruction in science and literature and in the branches required for thorough training in business methods, as well as in art, this university devotes particular attention to agriculture and mining, the two great industries of Arizona.

In the School of Mines and the agricultural experiment station, each with its director and staff, much valuable practical investigation is carried on for the benefit of the people in addition to the training afforded those who are preparing to engage in these pursuits.

SCHOOL OF MINES.

The results of this institution are being rapidly demonstrated. Situated in the heart of a rich mineral region, the students acquire a practical knowledge seldom obtained in similar schools in other portions of the country. All classes of ores and minerals are received, tested, and analyzed, and the various processes for the reduction of the same determined. The students also visit the mines in the surrounding districts and become acquainted with the applied principles of mining in all its branches. The mining interests of the Territory receive much benefit from the tests thus made. The most successful methods of treatment and the practical results are determined, so that mills and reduction plants are not being placed on mines before the kind of machinery necessary for the treatment of the particular class of ore is tested. Large fortunes have been recklessly spent in the erection of

plants in which ore could not be properly treated. This is a thing of the past in the mining industry of Arizona. The School of Mines has in a great measure brought about the change. It is now giving to the Territory mining engineers, a benefit to the mining industry which must be self-evident. The director of the School of Mines has also begun the study of the geology and mineral resources of the Territory, a work which must be productive of great benefit in the development of our resources. It would seem a very desirable act for Congress to provide the mining schools of the West with a fund similar to that annually appropriated for the agricultural experiment stations. The work performed in our School of Mines is of a high order and of much practical utility, but it is now done at great disadvantage because of the lack of means for its proper prosecution.

AGRICULTURAL COLLEGE AND EXPERIMENT STATION.

The Territory is also realizing the valuable results from the agricultural college and experiment station. As befits this region, special attention is given to irrigation and water supply as well as to agriculture, horticulture, and chemistry. The analyses of the soil and water of the different agricultural and horticultural districts give to the farmers scientific information as to what the soil will or will not produce successfully. These investigations are of incalculable value.

The study of plant life peculiar to the Territory and the uses of the respective species is also proving of much advantage. Illustrative of this fact is the information as to the results obtained in the study of canaigre (a tanning tuber) details of which are given on another page.

I have taken this opportunity to refer to these schools and their operations with a view to showing the practical results flowing therefrom as intelligent aids to the development of the resources of the Territory.

TERRITORIAL REFORM SCHOOL.

By an act of the last (the seventeenth) Territorial legislature there was established and located in Coconino County an institution known as a reform school for the confinement, discipline, education, employment, reform of juvenile offenders in Arizona. The government of the institution is vested in a board of three trustees, appointed by the governor with the advice and consent of the legislative council.

A tax of half a mill on each dollar on the assessed value of the property of the Territory must be levied for the years 1893 and 1894, which tax is to be used for the purpose of building and equipping the institution. The board of trustees charged with the duty of locating the building have selected Flagstaff as the place for this purpose. The work of the building will be commenced in the coming year.

THE PRESS.

The educational interests of the Territory are well represented by an active, liberal, and progressive press. There are in this Territory nine daily papers and twenty-seven weeklies. Of the dailies four are Democratic, four Republican, and one independent. Of the weeklies thirteen are Democratic, ten Republican, and three independent. While earnest in their advocacy of the principles of the respective parties which they represent, the journals of the Territory devote themselves to the material, social, and educational interests of the people at large rather

than to political discussions. As the great journals of the nation are to be found on the side of justice and right, of the weak against the strong, so it is with every daily and weekly in Arizona. In the press every worthy movement finds an earnest, fearless, and disinterested champion.

LABOR.

Owing to the fact that labor in this Territory is largely engaged in mining and agricultural pursuits, no general organizations are formed save those of railroad employés. Nevertheless the condition of the laboring classes is exceedingly good. Farm hands receive from \$1 to \$2 a day, and railroad employés receive a higher rate of wages than in any other portion of the country. The wages of mechanics run from \$3 to \$5 per day. There is a great demand for domestic help. Domestic earn from \$20 to \$30 per month. The demand and supply for labor being about equal there have been no labor disputes thus far in the Territory.

INDIANS.

The condition of the Indians, all things considered, is quite satisfactory. According to the last census the population is about 35,000. The policy adopted during the last administration of Mr. Cleveland having for its purpose the removal from the Territory to distant points of the country of the criminal and disturbing elements of the Apaches has resulted in what appears to be a permanent ending of Indian depredations. Not only those who were removed but those who remained on the reservation have been greatly improved. The Apache outbreaks, raids, and destruction of life and property are things of the past. The schoolhouse for the industrial education of Indian boys and girls and the plow and other farming implements for the adults have in a measure taken the place of the bow and arrow and rifle in securing sustenance for the warriors and their families who were once the terror of the country.

ARMY OFFICERS AS AGENTS.

The policy of appointing army officers instead of civilians as Indian agents is a wise one. One of the chief sources of Indian troubles in the past has been the dishonesty of agents appointed from civil life. The change has reduced the danger to a minimum, as experience shows, and is a step toward placing the control of the Indians under the military arm of the Government and thus giving to the hand that feeds the power to punish. With this policy thoroughly inaugurated there will be much less danger of Indian outbreaks.

During the past year there has been but one source of annoyance. This has arisen from the outrages of the noted Apache outlaw, "The Kid," who, with such assistance as he could receive from the reservation, has succeeded in evading both the civil and the military authorities. There are well-founded hopes, however, that the career of this band will be speedily terminated.

INDIAN SOLDIERS.

In this connection I would call attention to the dangerous policy of enlisting Indians as United States soldiers, a policy from which nothing but evil results have ensued. The training of the Indian in the use of the most improved firearms and ammunition and the skill which

he acquires in the service are calculated to make him a dangerous foe rather than a safe defender, for it is a fact that in the majority of instances the enlisted Apache is no sooner discharged than his marauding inclinations assert themselves, and he goes forth a greater terror than ever from the skill which he has acquired through military discipline. Further, it is a fact that the Indian soldier is the most enthusiastic patron of the army saloon or canteen, and here it will be observed that his military training cultivates rather than diminishes his savage instincts. Altogether the discharged Apache Indian soldier is a menace to the good order of the Indian reservation to which he retires, as well as to the sections of territory through which he has been accustomed to roam. The cherished hope of advancing the Indian in civilization by enlisting him in the Army has not been realized; on the contrary it increases his disregard for the sacredness of human life.

MEANS OF CIVILIZATION.

The most effective means of bringing about this civilization, I believe, is by work and removal to a far distant region of country, the physical conditions of which are in striking contrast to his native surroundings. Toil is the great civilizer of every savage race. The application of the edict "in the sweat of thy face shalt thou eat bread," should include the Indian as well as the balance of the human race. As to the civilizing influence of removal a striking example is afforded by the Cherokee, Choctaw, Seminole, Creek, and other tribes who were sent to the Indian Territory from the Southern States. It is also true that the removal of the Chiricahua Apaches from Arizona to the Atlantic States five years ago did more to civilize them than could have been accomplished in twenty-five years had they remained in the Territory.

It must be understood that my remarks on this point apply to the adult Indians, whose habits it is impossible to eradicate so long as they remain in the midst of their old surroundings.

As to the best means of dealing with the children, this is treated of in another place.

INDUSTRIAL TRAINING.

There has been most encouraging progress made during the year in the line of industrial pursuits on all the reservations, probably less, however, among the Apaches than in any other tribe. The lack of water for farming purposes is the greatest drawback on all the reservations in the Territory, and I would recommend most liberal appropriations to supply this want—if necessary, at the expense of the sums provided for these occupants maintained in idleness and thus encourage the Indian to become self-sustaining by the fruits of his own toil, a matter of primary importance in the consideration of his civilization.

THE MOHAVES.

The Mohaves on the Colorado River Agency have during this year adopted modern methods of farming for the first time in their history. Heretofore they only planted small patches of ground along the river bottom and consumed the product as fast as it matured. During the past year about forty families have been farming under an irrigating

ditch with marked success, the water being supplied by two steam pumps. Formerly the Mohaves did their planting with a stick. Now under a competent farmer they plant with plow and hoe. The most excellent results have already been achieved, but much better are expected for next year as the experience of the past season was their first in civilized methods of tilling the soil.

THE PIMAS, PAPAGOE, AND MARICOPAS.

The progress made by the Papagoes on the Pima Reservation has also been highly encouraging. This agency includes three tribes, the Pimas, the Papagoes, and the Maricopas, aggregating about 7,300 in population. These are the most civilized and industrious Indians in the Territory, and from time immemorial have been friends of the whites. They are largely engaged in pastoral and agricultural pursuits. The Papagoes produce annually about 6,000,000 pounds of wheat in addition to other cereals, and a variety of vegetables. This produce is their chief means of support. There is a great lack of water necessary to the cultivation of the quantity of land which these tribes are desirous of farming. This suggests the necessity of aid from the Government to help them in their work.

INDIAN SCHOOLS.

The educational interests of the Indians in the Territory have made most gratifying progress during the year. The Indian population available for schools is about 4,500, and the number enrolled is 1,202, of which 799 are enrolled in the Arizona schools and 403 in the schools outside of the Territory. The Tucson, Pima, and Phoenix training schools have given the most marked results. Here attention is directed to industrial training. Each of the schools has tracts of land which, under the instruction of a farmer, are cultivated by the boys. It is a fact worthy of note that the boys trained in these schools make most desirable farm help and the girls equally good domestics. Thus they are rapidly converting Indian boys and girls into industrial factors. It is interesting, too, to note how quickly these pupils come to understand that time and labor represent money, which can be exchanged for cattle and household goods. Many of the Indian girls are experts at the sewing machine and musical instruments, in which they invest a portion of the profits of their toil.

The progress of the parents of the boys and girls attending these schools is indicated in the improved condition of their dwellings, in their manner of living, in the kind and quality of their clothing. It should also be noticed that the moral and religious training of the children of the desert go hand in hand with their mental and industrial education. Referring more fully to this portion of the subject, I may quote the following extracts from a report submitted by request to me by the Rev. Howard Billman, superintendent of the Tucson Indian industrial training school:

Indian population in the Territory	35,707
Indian population of school age.....	7,134
Indian population available for schools.....	4,280
Children enrolled in schools.....	1,202
Children enrolled in schools in Arizona.....	799
Children enrolled in schools outside of Arizona.....	403

The school accommodations in Territory for 1893 were as follows:

Navajo	100
Moqui	50
Keam's Canyon	110
Day school	50
Fort Mojave	150
Colorado River	75
Phoenix	125
Pima	125
Tucson	175
San Carlos	60
White Mountain Apache	50
Total	1,070

Since 1880 there has been apparently an increase in the Indian population of 3,276. In that year there were only 73 children enrolled in schools, 48 Pimas and 25 Navajoes. These were enrolled in two reservation boarding schools, totally devoid of equipments to do effective work.

In estimating the advance traceable to the influence of the schools, it must be borne in mind that it is only very recently the children educated in industrial schools began to return to their homes, and even now the number is not large.

My observation, extending over a period of five years, has been confined to the Pima and Papago Indians. The results may be summarized as follows: There has been organized the first church among the Pimas, which numbers nearly a hundred members. For sobriety, good behavior, and faithfulness these Indian church members will compare favorably with the Christian people of any Anglo-Saxon community. Within this period two evangelists have received a simple preparation and are now commissioned for work among their own people; they are holding services in two chapels built on the reservation. At the organ sits an Indian girl who leads the music. Many of the Indian families, where the parents are church members, are accustomed to maintain family worship; and at the chapel, 10 miles distant from the agency, while the children are at home from our school in the summer time, they keep up their own prayer meeting.

Within this period of five years the first Indian dwelling has been covered with a shingle roof, and now there is a considerable number of homes so covered. Within this period also the first Indian merchant has opened a trading post among his own people. Within this period the first Indian boy has been employed as teacher, the first boys as carpenters, and firemen for engines for ranchers and flouring mills. It is needless to say these are all returned school children.

A very general improvement in dress and cleanliness, in household utensils, and farm implements has been made within this period. One thing which is clearly demonstrated, by what may be observed among the Pima Indians, is that the parents on the reservation are slowly advancing rather than the children retrograding in the tug of war which goes on between the old and new order of things.

There is only one recommendation that can be made that will greatly advance their interests, viz, that the Government should appropriate large sums of money to build necessary ditches and dams for purposes of irrigation. Until this is done any other recommendation that might be made, even if followed out, would exert but a limited influence for good.

HOME EDUCATION.

It will be observed that the number of Indian children enrolled on the school list outside of the Territory is 403. The wisdom of the policy of sending these children out of Arizona has been questioned on the grounds of health and for other reasons, among which is the fact that their parents object to their attending schools in the Territory, fearing that they may be removed to other schools outside of the Territory. It is worthy of notice, too, that the health of the children attending home schools is good; that of those attending schools outside of it bad, with the exception of those at Fort Lewis, Colo., where they are all unusually healthy.

I must submit that the cost to the Government of maintaining these children in foreign schools can not be less than it would be here. In addition to the cost of education must be added that of transportation,

and seeing that the children eventually return to Arizona, would it not be best to give them an industrial training in the Territory, where they must depend upon the fruits of their industry for their support, and where the methods of farming, stock-raising, and modes of building are very different from those surrounding the foreign schools?

SCHOOL ACCOMMODATIONS.

The number of Indians available for schools is 4,280, yet the school accomodation in Arizona is only 1,070. In view of this fact I would suggest that the buildings on the abandoned Fort Lowell Reservation near Tucson could by the expenditure of a very moderate sum be made to accomodate from 400 to 500 pupils, and even more. There is a large number of garrison buildings in excellent condition requiring little trouble save renovation to render them suitable for this purpose for many years. Several military companies were stationed at Fort Lowell and a vast sum of money expended in erecting the buildings now there and improving the grounds. There is also an abundance of agricultural land included in the reservation which could be utilized for the industrial training of pupils, and which would in a measure render the schools self-sustaining. This reservation was abandoned and transferred to the Interior Department by Executive order February 24, 1891. The reservation included an area of 49,920 acres, some of which is good agricultural land susceptible to irrigation by the Rillito Creek, which flows through the entire tract. I would most earnestly recommend that the Fort Lowell buildings be set apart to be used as an industrial training school, and that in connection therewith a portion of the land be reserved for the same purpose. I do not know of a more practical, economic, and judicious means of increasing the school accomodations for the Indian children in this Territory than the one here outlined.

REDUCTION OF INDIAN RESERVATIONS.

For several years efforts have been made to have the coal lands of the White Mountains (San Carlos) Indian Reservation segregated and opened for occupancy and development, the returns for the sale of these lands to be placed in trust for the use of the Indians. These coal fields are of no benefit to the Indians, and if opened to development would prove a great boon to southern Arizona and would be in the interest of the general welfare. The reduction of the Colorado River Agency is recommended in the interests of both the Indians and the settlement of that portion of the Territory. The reason set forth for this reduction is stated by United States Indian Agent George A. Allen, in communication of August 13, as follows:

The Colorado River Reservation contains 128,000 acres of land; about 50,000 acres is bottom land, lying along the Colorado river; 10,000 acres is more than the Mojave Indians could ever cultivate, as they can raise from two to three crops a year under a system of irrigation, and I would recommend that at least half of the reservation be thrown open to settlement and the proceeds derived therefrom be appropriated to increase the irrigating plant already in operation on the reservation. This will result in great good to the Mojave Indian by bringing him in contact with the better class of white men who would locate and improve the land. The reservation now occupies all the arable land for many miles on the river; consequently the Mojaves on reservation are isolated from the white settlements and can find no work except on the railroads, by which they are soon demoralized by coming in contact with the vicious class who sell them whisky.

BOUNDARY LINES.

In view of the frequent friction between the stockmen and Indians as to the boundary lines of reservations, I would recommend that the reservations be surveyed and the lines plainly established, especially those of the Hualapai and Navajo reservations, in the vicinity of which the rights of grazing land are frequently disputed.

TRIAL OF INDIANS.

I would also call your attention to an act of Congress approved March 3, 1885 (23 Stat., 385), taking from the United States courts of the Territories jurisdiction in the trial of Indians living on reservations, etc. I find upon inquiry that owing to the fact that the Government having failed to reimburse the county governments of the Territory, which have already expended large sums in the prosecutions pursuant to said act, officers, under advice from their supervisors, have grown negligent and indifferent, and I seriously apprehend, should the real feeling become known on the various reservations, that the law is not and will not be enforced, a condition of affairs may arise which will impede our progress and civilization and materially injure the Indians.

In urging legislation upon this matter I can not do better than call your attention to the reasoning of Mr. Justice Miller (U. S. Reports, CXVIII, p. 383):

It seems to us that this is within the competency of Congress. These Indian tribes are the wards of the nation. They are communities dependent on the United States, dependent largely for their daily food, dependent for their political rights. They owe no allegiance to the States, and receive from them no protection. Because of the local ill feeling, the people of the States where they are found are often their deadliest enemies. From their very weakness and helplessness, so largely due to the course of dealing of the Federal Government with them and the treaties in which it has been promised, there arises the duty of protection, and with it the power. This has always been recognized by the Executive and by Congress, and by this court, whenever the question has arisen.

The power of the General Government over these remnants of a race once powerful, now weak and diminished in numbers, is necessary to their protection, as well as to the safety of those among whom they dwell. It must exist in that Government because it never has existed anywhere else, because the theater of its exercise is within the geographical limits of the United States, because it has never been denied, and because it alone can enforce its laws on all the tribes.

I feel sure a law of Congress placing the trial of Indians for offenses committed both on and off the reservation exclusively in the United States courts of the Territory would, besides lifting a great burden from the Territory, prove to be a great saving to the Government and insure justice to the Indians.

On this subject I herewith submit the following from E. E. Ellinwood United States Attorney for the District of Arizona:

In regard to the matter of bringing to the attention of the Interior Department and Congress the advisability of having all crimes which are committed upon reservations prosecuted in the Federal side of the courts, too much can not be said. In the first place, the inadequate force in the ordinary sheriff's office and the lack of funds of counties absolutely prevent the apprehension and arrest of criminals, and I am informed that some boards of supervisors have openly advised the peace officers of their counties to give no attention to these crimes and offenses, while others look with extreme disfavor upon any effort to bring "reservation criminals" to justice. And this is not without reason, for the arrest and trial of such persons necessitates the expenditure of a great sum of county money, with little or no hope of getting it back from the Federal Government. Thus far these counties who have been so unfortunate as to have crimes committed upon the reservations within or contiguous to their counties, and where an arrest and trial has been had have in no

instance been able to get the money thus expended returned. The bills after proper presentation will probably be allowed, but I very much doubt if there is at present any appropriation from which these claims can now be paid, and thus the counties are out thousands of dollars, without gaining any benefit, even a protection to their white settlers, as the cases are chiefly those of the commission of crime by one Indian against another, a matter in which the taxpayers and settlers have no immediate interest.

The marshal's office could more easily guard the interests of the Government upon these reservations, and in fact it is the Government's business. Moreover, if the Government intends these claims should be paid, it will be found that the cost under the Federal statute in fees to the marshal, clerks, etc., is much less than that which counties now pay their sheriffs, clerks, etc., and which is to be returned to the counties by the Government.

In this county no attention is paid to reservation crimes, and should the sheriff undertake it there would be a protest from nearly every citizen and all prosecutions stopped.

INDIAN DEPREDATION CLAIMS.

There are a number of Arizona pioneers who, during the days of Indian depredations, lost nearly, if not all, of their hard-earned fortunes at the hands of the Indian wards of the Government. These early settlers stood the brunt of the conflict which wrested the Territory from savagery to civilization. Some of them are destitute and have claims against the Government for Indian depredations, which are in slow process of adjustment. In justice to these old citizens I would urge a speedy settlement of these claims, some of which date back more than a quarter of a century.

THE COLORADO RIVER.

This river, which empties into the Gulf of California, is by far the most important of any stream west of the Mississippi River, and second within the borders of the United States west of the Rocky Mountains. It is formed by the union of the Green and Grand rivers in Utah, draining a vast area of the Rocky Mountain region. From its mouth to the head of the Green River it is 1,800 miles long. It has been navigated by light-draft steamers since 1852, and until the advent of the Southern Pacific Railroad Company into Arizona in 1887 was the only practical way of supplying the mercantile wants of south-eastern California and Nevada bordering its banks. All of Arizona and a portion of New Mexico received their supplies through this same channel.

The river is navigated at high water (through the months of May, June, July, and August) from its mouth to the Rio Virgin, a distance of 640 miles. No other river on the western coast of the United States has that length of uninterrupted navigation.

Steamers are run from the mouth of the river to Fort Mohave, Ariz., (465 miles) at all seasons of the year, but with great difficulty, which could be remedied by a reasonable outlay.

I am informed that in 1884 the General Government appropriated \$25,000 for the improvement of the river from the Needles, Cal., to El Dorado Canyon, Lincoln County, Nev., at the instance of the member of Congress from Nevada. This sum was expended under the direction of river and harbor engineers of the Pacific coast, directly under Capt. Payson, United States engineer, whose report of 1884-'85 will show what was done with the appropriation.

The expenditure of \$15,000 (that being the amount spent directly on the river, out of the \$25,000) has enabled steamers to run to El Dora-

do Canyon a month later and earlier in the season, and also lessened the chance of damage to the same.

About \$10,000 of the appropriation was expended in surveys and fitting out a barge for the work; the barge cost \$8,000 and was used only two winters. No further appropriations were made and the barge was sold at auction for about \$600.

The outlay of \$15,000 actually expended on the improvement of that portion of the river designated in the appropriation gave most satisfactory results.

The survey already made is deemed sufficient by river men for the further needed improvement. Those capable of passing an accurate judgment on this subject declare there is no river of such importance in the United States which can be so much improved with so little assistance from the Government as the Colorado. Neither is there a stream the improvement of which will open navigation through such a storehouse of boundless wealth. From Yuma up to the Grand Canyon the stream flows through a rich mineral region of gold, silver, copper, and lead and through large areas of agricultural land tributary to its banks. These are being reclaimed and when made easy of access will become the homes of thousands of families.

The opening up of transportation facilities to farmers and miners of western Arizona and southeastern Nevada and California would create a most profitable commerce and develop a vast amount of wealth which to-day can not be utilized for want of transportation.

Further, the improvement of this river would open a permanent and direct communication between the Southern Pacific and the Atlantic and Pacific Railroad, thus uniting northern and southern Arizona by a transportation line which will at once bring about an exchange of products and create a large amount of traffic for these lines. With this river opened to the Gulf of California, which could be done at a comparatively reasonable expenditure, ocean steamers could be landed at Yuma during the entire year and thus a most important shipping point and mart of trade communicating with all parts of the world by water would be established in Arizona. The value of this to the United States would be exceedingly important from many points of view while to Arizona it would be of great benefit in furnishing cheap transportation for our imports, lumber, machinery and other building and mining supplies as well as in enabling us to export our surplus of grain, cattle, and rebellious ores to foreign markets.

This river that has been and is still of so much use to the country, and which by improvements could be made of so much additional service, certainly is entitled to careful consideration. In view of these facts I would earnestly urge a liberal appropriation for the improvement of the Colorado River.

In support of the foregoing I submit the following from Capt. Isaac Paolhamus, who is to-day, and has been for many years, navigating this river:

In reference to the matter of the necessity for an appropriation by Congress for the improvement of the Colorado River, I respectfully call your attention to the following facts, gathered by me from an experience of thirty-seven years in navigating said river. The distance from Yuma to the mouth of the river is 150 miles, and the river through that distance could be improved readily and at comparatively small cost, as the material is close at hand; the river at high water is navigable 640 miles from its mouth, but at low water, with hard work, expense, and danger from sunken rocks, rapids, and other obstacles, only about 450 miles; these sunken rocks, rapids, and other obstacles can be removed or improved by a judicious expenditure of an appropriate amount of money so that navigation would reach the high-water point unimpeded; the advantages to be derived to the Territories of Arizona and

Utah, and the States of California and Nevada, would be incalculable in the opening up of immense mineral, agricultural, and grazing resources. Rich mines of gold, silver, lead, copper, and coal would be made tributary to the river, as would vast tracts of agricultural and grazing lands. Gold, in particular, predominates. As it is now these mines and lands can not be furnished with supplies except during the high water of the river, some scant four months during each year, and so machinery must be idle the remaining eight months, and mines can not be worked or lands utilized profitably. Certainly it is to the interest of the Territories and States mentioned to use every effort in the direction of procuring an appropriation.

PUBLIC BUILDINGS.

Arizona has no public buildings erected by the Federal Government. There is need, however, for such. There should be at least three buildings, one in northern, one in central and one in southern Arizona.

There is not less than \$16,000 paid annually by the Government for the rent of Federal offices, these including the judicial, executive, land offices, revenue department, etc. It would be on the line of economy for the Government to make sufficient appropriation for the purpose specified, as the annual rental would pay a most liberal interest on a sufficient sum to construct commodious buildings at each of the places named.

The public buildings of the Territory consist of the university at Tucson, the insane asylum at Phoenix, the Territorial prison at Yuma, and the normal school at Tempe, all of which were erected by the Territory without one dollar appropriation by Congress; and this in face of the fact that the customs duties at Nogales for the district of Arizona for the last fiscal year were \$60,673.75, and the internal revenues collected from this district, including New Mexico, were nearly \$50,000 for the same period, of which probably not less than \$25,000 was contributed by Arizona, making a total of \$85,675.75 collected in the Arizona district. All other considerations apart, Arizona has a right to ask for a liberal appropriation for public buildings. In this connection I would call attention to an act of Congress passed January 22, 1867, which provides that the net proceeds of the internal revenue collected in this Territory during the fiscal years ending June 30, 1867, 1868, and 1869, were to be applied for the erection of a Territorial penitentiary, the amount so appropriated not to exceed the sum of \$40,000. No part of this sum has ever been received by the Territory, although during these years the revenues were promptly collected. I would, therefore, most respectfully request that the \$40,000 thus provided for be now appropriated for the use of the penitentiary.

LEGISLATION.

The last (seventeenth) legislature, whose session expired by limitation on the 13th day of April, enacted among other laws the following:

Making the Territorial auditor *ex-officio* bank comptroller. For the prevention of cruelty to animals. Regulating the practice of dentistry. Creating a Territorial museum. Providing for additional buildings for the normal school. For the repair of irrigating canals. To regulate houses of ill fame. To establish and provide for the maintenance of a reformatory school. Creating a new fee bill. Providing for publication of supreme court decisions. To encourage the impounding and storage of water. Regulating canals and ditches and relating to the appropriation of water.

Memorials were adopted asking for the segregation of the San Carlos coal fields on the White Mountain Reservation; also, relating to the

Navajos and Navajo Reservation; asking an appropriation for the sinking of artesian wells; asking for an appropriation for the survey of the whole tract of land contained within the limits of the Atlantic and Pacific Railroad, to the end that the same may be made subject to Territorial taxation; also concurrent resolutions regarding the international boundary line between the Territories of Arizona and New Mexico, and other minor resolutions.

TERRITORIAL PRISON.

Since its establishment the Territorial prison has been a source of great expense to the Territory, in fact, greater than that of all the other institutions combined. This, I think, has been due in a measure to mismanagement. No well-directed effort has ever been made to make convict labor sustain in whole or in part the maintenance of the institution. Absolutely nothing has ever been received from this source. Thus the law-abiding, industrious citizen is taxed to maintain the criminal in idleness. An effort is now being made to bring about a change.

I would call attention to the fact that a body of 2,000 acres of land, subject to inundation, adjoins the prison grounds on the north, all of which is unoccupied and could be reclaimed to agriculture by prison labor. I confidently believe that the products of this land would almost, if not wholly, maintain the prison. I would therefore recommend that the said tract of land, located near the intersection of the Gila and Colorado rivers, in the county of Yuma, Territory of Arizona, be granted to Arizona for the benefit of the Territorial prison, to wit, all the fractional sections numbered 12, 13, 14, 15, 22, and 23, T. 8 S., R. 23 W., located between the Gila and Colorado rivers aforesaid and containing 2,015 acres, more or less.

YUMA LEVEE.

Last Congress made an appropriation of \$10,000 to construct a levee on the south side of the Gila River, to protect the town of Yuma from the overflow of the said river. I am pleased to report that the engineering work has been completed and the work of construction will be commenced during the present month.

PRIVATE LAND CLAIMS.

The delay in the settlement of title to private land claims originating under the Mexican Government is nearing a termination. The creation of a court of private land claims with jurisdiction to determine these titles at once removed this vexed question from the legislative or political to the judicial branch of the Government, where the law and the facts affecting the same could be more carefully and deliberately considered and the sacred treaty obligations determined by courts of judicial learning rather than Congressional committees. There are twenty-one of these claims in Arizona, containing an area, according to the claimants, of about 6,000,000 to 7,000,000 acres. Much choice land is covered by these claims, and the uncertain settlement of the title previous to the creation of the private land court had caused considerable friction between the settlers on and the claimants of the lands. Now, when all but two or three cases have been filed for the decision of the court, this friction has nearly or altogether ceased. One of these cases, that of the Algodones, located in Yuma, was deter-

mined at the February term of court, held at Tucson, in favor of the claimants, but the Government, believing that the decision was not warranted by the law and the facts, ordered an appeal to the United States Supreme Court. In view of the fact that the land covered by this grant is rapidly being reclaimed to agriculture, it is to be hoped that the appeal will be pushed to a speedy ending, as the delay will do much to hinder the rapid settlement and consequent prosperity of the county in which it is located. The next term of this private land court will be held in Tucson at an early day, at which term it is believed that a number of titles will be determined. There is probably no one thing since the settlement of our Indian troubles which will give so much relief to the settlers and aid in the rapid development of the country covered by these grants as their prompt adjudication. Hundreds of people are loth to improve their lands while these titles are unsettled. The following is a list of the claims in the Territory:

San Rafael, San Ignacio del Babocomori, San Ignacio de la Canoa, Tumacacori, Calabasas, San José de Sanvita, San Rafael de la Sanja, Aribac, San Juan de las Boquillas y Nogales, Los Nogales de Elias, Otero and House lot, El Saporí, Maria Santisima del Cormenor Buena Vista, El Paso de las Algodones, San Bernardino, Peralta, Agua Prieta, Huebabi, Tres Alamos, San Pedro, Buena Vista.

RAILROAD LAND GRANTS.

Under the act of Congress approved July 27, 1866, the Atlantic and Pacific Railroad Company are entitled to 7,000,000 acres of land in this Territory. They have selected some 3,000,000 acres, where the lines of public survey have been extended, leaving more than one-half to be yet designated. The survey of all these lands should be made without delay. The revenues of the Territory would be increased not less than \$100,000 per annum from the taxes paid.

MILITIA.

The national guard of Arizona consists of one regiment of infantry of eight companies. The Territory provides for an allowance of \$30 per month for each company for current expenses. So far as the equipment is concerned, the militia is now in a much better condition than it has been at any other period of its existence, and before the end of the fiscal year the condition will have so much improved that should any emergency arise the guard can be readily put on a campaign footing. I submit the following report from the adjutant-general of the Territory:

HEADQUARTERS NATIONAL GUARD, ARIZONA,
OFFICE OF THE ADJUTANT-GENERAL,
Phoenix, Arizona, August 24, 1893.

SIR: I have the honor most respectfully to suggest that as soon as practicable the military forces of the Territory be increased by six companies of cavalry and not less than one light battery of artillery; this will place between twelve and fifteen hundred well armed and equipped soldiers in the service of the Territory. I would also recommend that the apportionment of the appropriation made by the National Government for this Territory be increased at least to \$8,000.

This is made necessary from the fact that the General Government is gradually drawing its regular forces out of the Territory.

We have several warlike Indian tribes within our Territory; and without a military force that could be brought in the field at short notice our entire southern

border is at the mercy of a foreign nation, bands of outlaws from which will be constantly committing depredations on our border citizens.

We are on the verge of statehood and a good military force well equipped is absolutely necessary for the protection of citizens and property within our borders.

E. SCHWARTZ,
Adjutant-General.

Governor L. C. HUGHES,
Commander-in-chief of the military forces of Arizona,
Phoenix, Arizona.

OSTRICH FARMING.

Among the industries attracting attention in the Territory is that of ostrich farming. Mr. Josiah Harbert, who has an ostrich farm near Phoenix, describes his experience in the business as follows:

On January 1, 1891, I only had two birds; since then I have raised thirty-six off one hen. I consider it the best business a man can go into, because each bird will turn off about \$30 in feathers a year, besides the eggs and the increase. The birds are all healthy. I have lost but one, and it got fastened in the wire fence and killed itself. They begin to lay at three years old. The eggs that don't hatch bring \$1.50 per shell. Period of incubation is six weeks. They are easily kept under fence. They feed on alfalfa, and should occasionally have crushed bone, and gravel continually. I pluck the birds when eight months old and every eight months thereafter.

A gentleman conversant with the industry in Africa, says that he never saw any birds raised there in confinement that looked any better than my birds raised here near Phoenix.

At two years old birds are worth about \$200 each. Guaranteed breeders from three to four years old are worth from \$300 to \$400 each. The climate is perfect for the health and well-being of the birds, and an acre in alfalfa will carry from four to six.

ARIZONA CAMELS.

In the year 1855 the War Department imported from Smyrna, Asia Minor, a number of camels. They were landed at Galveston, and from there taken overland to Los Angeles for the purpose of transporting military supplies from that point to the various coasts of Southern California and Arizona. En route, however, a number of these camels were lost or strayed in the vicinity of the Agua Caliente, about 75 miles east of the Colorado River. The remainder were delivered at their destination, but their use was found impracticable, the sand being too sharp for their feet, and considerable hostility being excited against their use amongst teamsters and freighters, who took occasion to shoot them on the ground, that their presence caused a stampede of their horses and mules. Of the camels taken to California a number was returned to Arizona in 1876, for the purpose of transporting ores from the then rich Silver King mine.

Here, again, their presence was objected to by teamsters and freighters, and the band was turned loose between the Gila and Colorado rivers, through which section they have been roaming ever since. In 1883 nine of the band were captured by Papago Indians and turned over to a circus. At that time there were twenty head in the herd, eleven of which were 2 or 3 years old. The Arizona stock is said to be a great improvement on the original.

Col. D. K. Allen, of the Yuma Sentinel, makes this statement with reference to the subject:

At the present time there are ninety-seven of them in the mountains and hills east of the Yuma and Harqua Hala wagon roads, away from the haunts of white men and Indians. They have roamed mostly in the Eagle Tail Mountains and adjoining ranges, where but few, if any, human beings ever go. It is estimated that if none had been killed there would now be not less than one thousand. They are very wild and vicious and make a hard fight when caught or even cornered.

In order to prevent the further destruction of these animals I would suggest that they be removed to some national park, such as Yellowstone or the Zoölogical Gardens in Washington City.

PETRIFIED FOREST.

In Apache County, in the eastern portion of central Arizona, about 20 miles from Holbrook, a town on the Atlantic and Pacific, is located Arizona's petrified forest. The area it occupies is covered by the land grant of the Atlantic and Pacific Railroad, every alternate section of which is reserved by the Government. It is estimated that there are about 10,000 acres in this forest, which consists of huge logs from 6 feet down in diameter. The ground is nearly all covered by trunks and limbs of petrified trees of every size and color, quantities of which have been shipped to various parts of the world and converted to ornamental uses. Recently parties have been wantonly destroying many of these logs with giant powder, blowing them open in order to obtain crystals which are found in the center. While there is little danger of the supply being exhausted by the relic and curiosity hunter, some measures ought to be adopted to prevent the destruction to which I have referred.

Inasmuch as this is the most wonderful and beautiful center of petrified woods known to the scientist, and will always be a point of great interest to the traveling public, I would suggest that the Government withdraw the land covering this forest from entry, and secure from the railroad such portion as may be included in the area of this park, and that it be set apart as a national park for the enjoyment and education of the people, and thus preserve for future generations one of the most wonderful of nature's works.

HEALTH AND CLIMATIC CONDITIONS.

There is probably no section of the country which possesses climatic conditions so favorable to the restoration and preservation of health as Arizona, especially for those suffering from throat, lung, or other respiratory troubles. On this subject I present the views of Dr. Scott Helm, surgeon-general national guard of Arizona:

There are many conditions affecting the climatology of Arizona Territory which tend to the greatest influence for good to the consumptive, and, in fact, to all sufferers from diseases of the respiratory tract and also of the nervous organization. Owing to the peculiarities of its physical geography almost any elevation or surrounding, whether it be from the valleys below or the pine-clad hills above, may be obtained. The several cities of importance have the following altitudes: Phoenix, 1,100 feet; Tucson, 2,500 feet; Prescott, 4,500 feet; Flagstaff, 8,000 feet, and Yuma, 54 feet. It may be seen, therefore, that almost any elevation that may be desired may be obtained, and, as is well known to physicians and climatologists, many of these invalids demand a widely-varying altitude.

Other matters of the utmost importance in the selection of a suitable climate for the invalid—especially a winter climate—are the character of the temperature, the precipitation and humidity, and the number of sunny, cloudless days. First, as to temperature. The mean temperature for the Territory for the year ending June 30, 1893, ranged for the months from 43.6° to 83.7°, the former being in December and the latter in July. The greatest average precipitation for the Territory for one month was 2.24 inches, and the total for the year, 8.42 inches. During the year there were 213 cloudless days, 88 partly cloudy days, 51 cloudy days, and 25 days on which 0.01 inches or more of rain fell. This does not include the month of October, during which no observations as to the character of the days were recorded. All these conditions serve in the aggregate to render an atmosphere particularly beneficial to the consumptive or other sufferer from broncho-pulmonary disease. Rheumatic conditions, malarial disorders, and diseases of the nervous organization are also greatly benefited by residence in this climate.

The winter climate of southern Arizona is warm and dry and particularly healthful to this class of invalids, and especially so with the consumptive, provided he makes an early change. Many of these invalids seek this climate to avoid the rigors of the cold and snows of the eastern winter and the fogs and dampness of the coast; and a large proportion of them receive great benefit therefrom. Many of these cases, even though far advanced in disease, experience great relief in this soft, warm atmosphere and under these sunny skies, where they may spend over three hundred days in the year in the open air.

There are a number of resorts in the mountains—notably the Castle Creek Hot Springs, near Phoenix, and Oracle, near Tucson—where the summer months may be spent with much comfort and benefit.

The following is the meteorological summary for the year:

Months.	Mean temperature for the Territory.	Average precipitation for the Territory (inches and hundredths.)	Weather—character of days.			
			Clear.	Partly cloudy.	Cloudy.	Rainy.*
1892.						
July	83.7	1.29	11	10	9	5
August	83.0	1.15	16	9	6	4
September	77.7	0.17	20	6	3	1
October	63.4	0.81	.....	.....	.....	.....
November	54.4	0.15	23	4	4	1
December	43.6	0.54	21	4	5	3
1893.						
January	47.7	0.36	22	5	4	1
February	50.3	0.85	15	7	6	2
March	52.8	2.24	18	8	7	6
April	61.6	.....	22	6	2	.....
May	69.9	0.85	24	4	3	2
June	82.0	0.01	23	5	2	.....

*Days with 0.01 inch or more.

The above is based on reports from about forty stations in various sections of the Territory, and represents the average meteorological conditions for the several months.

MILEAGE OF JURORS.

I desire, through you, to call the attention of the Department of Justice to the insufficiency of the mileage and per diem paid jurors and witnesses before the United States courts in this Territory. Transportation costs from 10 to 20 cents per mile by team or stage and living at least \$2.50 per day while traveling and in attendance on court, and with one exception (the Southern Pacific, which charges 5 cents) every railroad in the Territory charges 6 cents per mile, while the Government allows but 5 cents per mile by railroad and 13 cents by stage; \$2 per day to jurors en route and in attendance, while witnesses are only allowed \$1.50 per day for actual attendance on courts; and by the ruling of the First Auditor and First Comptroller you will observe that the provisions of the act quoted are limited to travel to attend the United States courts, and do not include that made to attend examinations before commissioners. It must also be understood that stage lines or private conveyances should not be used when railroads are available by usually traveled routes.

The witnesses before commissioners' courts are only allowed 5 cents per mile, consequently the law is materially crippled in its first step. You will readily see from the foregoing why it is that witnesses and jurors try to avoid service, and when forced to attend court are prejudiced against the Government to such an extent as to make it next to impossible to punish offenders.

SALARIES AND CONTINGENT EXPENSES.

I would respectfully call attention to the action of Congress with regard to salaries of the Federal officials of the Territories and the contingent expenses allowed for the use of the executive office. The organic law declares that certain salaries shall be paid, yet year by year Congress, without changing the original law, reduces the amount specified by such sum as the public demand for economy may suggest. This is not only an injustice to the officials, but is not in the interest of the public service inasmuch as it leaves them at the mercy of the National Legislature so far as the question of their salaries is concerned. Similar action is taken with reference to contingent expenses. But one-half of the amount allowed under this head by the organic law is appropriated. This sum is altogether inappropriate to the needs of the department; the expenses of which are daily increasing. The sum of \$500 set aside by Congress to meet the contingent expenses does not more than pay postage, telegraphic bills, and office stationery, not to mention anything of janitor, messenger, or clerical hire, etc. The duties of the executive department are daily growing, and the cost of maintaining the office is consequently becoming greater every year. This is a matter which Congress does not seem to consider when the Territorial appropriations are made.

UNDEVELOPED RESOURCES.

The undeveloped resources of Arizona are boundless. Her mountains are threaded with gold and silver veins, large deposits of iron, silver and lead, and other metals. Millions of acres of land are awaiting cultivation by irrigation, and there is the Colorado River, which, with a slight improvement, will open up a source of mineral and agricultural wealth, and will give an outlet to the Gulf of California.

An important industry in the course of development, and one which it appears will yield fabulous returns, is the production of canaigre or the tanning root, which is indigenous to this soil and climate.

The demand for this plant, for tanning and other chemical purposes, is so great that it can not be met by the supply, a fact which suggests its cultivation as one of the most important industries of this region. It is authoritatively stated that the cultivation of canaigre will give a profit of \$100 an acre.

During last year Prof. C. Collingwood, J. W. Toomey, and F. A. Guley, of the United States experimental station staff connected with the University of Arizona, made an elaborate study and experiment of this plant, its history, growth, value, cost of production, profit, etc., and published the results in a station bulletin. The importance of the information obtained warrants the reproduction of copious extracts from the same:

CANAIGRE, ITS HISTORY.

Canaigre [says the report] has been used many years by the Mexicans, both as a medicine and as a tanning material, but only in recent years has it attracted any attention as an article of commerce.

In 1868 a sample of roots was sent from Texas to the Agricultural Department at Washington, but it was mislaid and the analysis was not made until 1878. In 1889 Prof. Henry Trimble published an article on canaigre, in which he gives its history to that time and records some analyses made by himself and others. He states that Mr. Rudolph Vaelcker, of Galveston, Tex., published an analysis of roots gathered in 1874, giving 23.16 per cent of tannic acid. Roots were exhibited at the New Orleans

Exposition labeled "A new tanning material." Since then considerable attention has been given to this plant, and a number of articles have been written, both in this country and abroad, in all of which it is agreed that canaigre is a valuable tanning material.

ITS VALUE.

Among the articles which have appeared is one deserving more than passing notice: "Canaigre, a New Tanning Process," by Prof. W. Eitner. Prof. Eitner is at the head of the Vienna research station for leather industry, and a recognized authority in Europe in such matters. He has tested canaigre from the standpoint of a practical tanner. In that article he especially recommends it for its quickness in tanning, its filling qualities, and its beautiful color. He says: "I consider this article especially adapted for tanning uppers, fine saddlery, and fancy leathers. It can be used alone or in connection with other materials." He also states that at the price laid down in Vienna—18 florins per 100 kilos (about \$65 per ton)—it is quite reasonable. In fact, he has everything to say in its favor and nothing against it.

The European tanners are awake to the value of this material. The German tanning school, at Freiberg, Saxony, mentions canaigre as one of the materials with which they are working and experimenting.

LIMITED SUPPLY.

The supply of wild canaigre is becoming limited. Good authorities state that at the present price the supply will hardly last more than two years. "At present price" means the supply within profitable hauling distance of the railroads. If canaigre is only to be obtained from the natural supply it will be but an incident in the tanning trade. But if, as the experiments at this station show, canaigre can be profitably cultivated, it will soon become a permanent factor, with thousands of acres of land producing yearly hundreds of thousands of tons of canaigre, and the problem will be to get the tannic acid into the market at the least expense.

GEOGRAPHICAL DISTRIBUTION.

The habits of this plant well suit it to hot and arid regions. Completing its annual growth in a few months, the remainder of the year it shows nothing above ground but dry and withered leaves and stalks. The deep-seated tuberous roots, however, are fleshy and full of moisture, and are capable of retaining their vitality through the long, hot, dry summers, until the rains of the following winter start in them a new growth; grows to highest perfection and greatest abundance in river bottoms and along washes. It seems to prefer loose, sandy soil, which is flooded at times of heavy rains. In such places it frequently forms a dense, green growth; 2 or 3 feet in height, resembling at a distance broad acres of some cultivated crop.

THE ROOT.

The tuber-like roots are the commercial part of the plant. In habit of growth, they remind one much of the sweet potato, or even more of the tuberous roots of the dahlia. In weight they vary from above a pound to a few ounces. Some are long and slender, others are nearly as broad as long. The size of the root depends to a great extent upon the soil and the amount of rainfall during their period of growth. They grow in clusters of from three to a dozen, and from a few inches to more than a foot below the surface of the soil. By examining a root in late summer or early fall a number of buds may be seen on the crown end ready to start their growth after the winter rains. The root apparently reaches its growth after the first season; however, it lives for several years, and may produce new plants and new roots each season. Possibly the large amount of tannin it contains aids in preserving it. The roots of a year's growth or more are a little more firm in texture than a potato; however, when they finally die, they become dry, hard, and nearly black throughout. In this condition they are quite as hard to cut as a piece of wood, and there is a large increase in the amount of coloring matter. By boiling, the root becomes softer, but does not break open and fall to pieces, as with the potato. The young roots are nearly white on the interior. As they grow older they become dark yellowish red, from the development of coloring matter within the cells.

AMOUNT OF TANNIC ACID IN CANAIGRE.

Samples, collected in widely different portions of the Territory, show the following composition. As old and new roots were taken together, just as they grow in

the hill, the rather wide variation is not unexpected. Fully three-fourths of the roots sampled were over one and two years old:

Near Florence, sandy loam	35.6
Near Florence, banks of Gila, sandy, rather fine	28.4
Near Florence, one-fourth mile from Gila, sandy loam	{ 30.8
	{ 30.5
Head of Florence Canal, banks of Gila, sand	{ 31.9
	{ 35.5
On mesa 20 miles west of Florence, sandy loam	29.0
Banks of Salt River, opposite Phoenix, near ditch, sandy and hard	{ 31.7
	{ 22.5
Banks of Salt River, opposite Phoenix, old cane field, sandy loam	33.4
Banks of Hassayampa, near Gila, rather fine sand	{ 30.0
	{ 23.0
Banks of Agua Fria, near Gila, sand	32.7
Banks of Salt River, near Phoenix	34.3
Average	30.62

KEEPING SEED ROOTS.

After removing from the ground, canaigre roots if piled in large heaps 4 or 5 feet deep will heat and ferment, and if in thin layers covered with dry earth they may keep indefinitely two or three years, but when moistened they will sprout and grow. Roots taken from a sack in the loft at our barn, where they had remained a year, were taken out when dry and corky, shriveled up and apparently dead, but when planted and moistened grew as readily as fresh gathered roots.

DEMAND FOR TANNIN.

The amount of tannic acid consumed in the world is enormous. Sources of supply are sought on all the continents, and there is fear of gradual exhaustion.

Most of the leather in this country is at present tanned with oak and hemlock barks and the supply is being rapidly used up, as in addition to the home use considerable quantities are exported. We also import tanning material for certain kinds of leather, and this demand is rapidly growing. One of the largest imports at present is "gambier," an extract derived from the leaves and young shoots of a tree belonging to the family "rubiaceae," genus "nauclea," a native of the East Indian Archipelago, largely cultivated for this purpose. During 1891 15,000 tons were brought into the United States, valued at \$1,500,000, and containing approximately 50 per cent of tannic acid. The amount used abroad is much larger, because European tanners depend more upon extracts than do those of this country. Six tons of green canaigre will make about 1 ton of extract, containing approximately the same amount of tannic acid as gambier. Ninety thousand tons of green canaigre would be necessary to replace the gambier imported into this country alone. From the high opinion practical tanners have formed of canaigre, it is not impossible that it will not only supplant gambier but take the place of many other tanning materials.

The amount exported during the past two years shows there is a demand at paying prices for large quantities, and one of the greatest obstacles in starting an industry introducing a new product to the trade is largely overcome. There is room for a large industry in growing and shipping the roots in a dry state, but the cost of labor in slicing and drying the bulky condition of the product after they are thus prepared stands in the way of the most rapid development.

The canaigre has this advantage over the sugar cane and the sugar beet, it can be prepared for market without expensive machinery for manipulation, but as the field of production is a long distance from the places of consumption, economy in transportation demands the extraction of the valuable element and placing it in condensed form.

It is important, therefore, that extract factories be established on a large scale, and that they be located on lines of transportation and where the lands in the immediate vicinity of the works may be planted to canaigre.

Our investigations in the laboratory show that there is no more difficulty in extracting the tannic acid from the roots, green or dry, than in separating sugar from cane and from beets. As in sugar making, the extraction will have to be done on a large scale and with expensive apparatus, but the returns will justify the investment.

The industry should be built on two lines, growing and manufacturing, the same as has been found most desirable and profitable in sugar production.

Capital must first be secured to build factories, after which there will be no difficulty in making contracts with persons to supply canaigre roots at stipulated prices per ton.

LOCATION OF FACTORIES.

There are several places on railroad lines in the Territory where land adapted to the plant may be procured at reasonable prices in tracts from 1,000 to 10,000 acres, where factories may be established.

The cheaper lands, such as from low situation are subject to late frosts and therefore not adapted to fruit growing, will make the best canaigre plantations. Even lands subject to occasional overflow are not objectionable. On such lands the wild growth is found in great luxuriance.

SOIL.

While the wild growth is confined to the sands and sandy loams, we find that if the roots are planted shallow and irrigated, equally large crops are produced on quite heavy soils and the roots are as rich in tannic acid. The plant seems not to be particular as to the kind of soil, provided it is kept sufficiently moist, and it may be found that our sandy loams and rather heavy soils may prove more profitable for growing the plant than the lighter soils, owing to their greater fertility and more lasting qualities without fertilization.

TIME OF PLANTING.

It seems not to matter seriously when the roots are planted, the formation of new roots beginning in the fall, from the latter part of September and continuing on until March or April. If planted in the late spring leaves will appear and lie down at the usual time in May, when the root planted will lie dormant through the summer and begin the formation of a new crop of roots at the regular season with no apparent advantage as compared with roots planted just before the growing season. If the soil is kept dry they may lie over until the next year, and then proceed to grow in the usual way when moisture is supplied.

TIME OF HARVESTING.

With the crop planted in the fall, as has been stated, growth above ground ceases the following May, but the roots, although they remain dormant, grow gradually richer in tannic acid during the year, but the increase is quite slow after July. With rain or irrigation in the fall the leaves appear above ground and a new bunch of tubers is started, but so far as we have observed the entire hill will produce no more new roots than would each single tuber if they are separated and replanted. In fact, we are inclined to think the single tuber will produce a larger new crop than the entire hill.

A point we have not yet determined is whether or not the one-year old roots increase in size the second year. They certainly grow richer in tannic acid. If they continue to grow it may be found most profitable to allow the crop to remain on the land two years; if not, the crop had better be harvested when the roots are one year old and the land replanted.

YIELD PER ACRE.

Commencing to irrigate by the 1st of October, a crop of 10 tons to the acre is a reasonable estimate for new land if the soil is fairly well prepared, and a good stand is secured by planting selected tubers of wild growth. The second year's crop from one-year old tubers should reach 15 tons, and 20 tons is within the possibilities on good land carefully planted and well taken care of.

SOCIAL CONDITIONS.

The progress of the Territory during the year in social conditions has been marked. There have been more homes established and families permanently located, especially in the Salt River Valley, than during any previous year. The increased strength of churches, reform organizations, and fraternal societies has been most gratifying.

CHURCHES.

The following indicates the strength of the various church organizations in the Territory:

Episcopal Methodist: Missions, 12; preaching places, 23; preachers, 15; membership, 554; Sunday schools, 20; pupils, 1,098; value of church property, \$45,200.

Methodist Church South: Churches, 6; preachers, 13; membership, 374; value of church property, \$20,500; Mexican missions, 2; membership, 63; church property, \$3,200.

Presbyterian: Churches, 5; ministers, 8; adherents, 500; enrolled communicants, 280; value of church property including Indian training school, \$30,000.

Baptist: Churches, 9; preachers, 9; membership, 550; value of church property, \$20,000.

Episcopal: Churches, 5; membership, 320; value of church property, \$18,000.

Catholic: Churches, 9; chapels, 13; resident priests, 9; and a presiding bishop. The number of adherents of this church is nearly as large as those of all other churches combined. There are two commodious hospitals under the care of the Catholic Sisters, who have also charge of two orphan asylums. There is a number of other charitable institutions under the direction of this church.

Mormons: Churches, 16; members, 8,910, including Sunday-school children. It is estimated that of the members 3,813 are on the Sunday-school roll.

There is a number of Christian Endeavor societies and Epworth Leagues connected with the various Protestant churches, which comprise in their membership a large percentage of the young women and men of the Territory.

REFORM SOCIETIES.

The Women's Christian Temperance Union is represented by local organizations in each county as well as by a Territorial organization. There are also branches of the Good Templars and several kindred societies, all in flourishing condition.

FRATERNAL SOCIETIES.

The Masonic organization and all its branches are represented by local and grand lodges, likewise the Independent Order of Odd Fellows, the Knights of Pythias, the Ancient Order of United Workmen, the Grand Army of the Republic, and other societies. There are also trades and labor unions, representing the different classes of railroad and telegraphic employés.

PATRIOTISM.

A spirit of fervent patriotism is manifested by the people in the observance of all days commemorative of the patriotic incidents in the nation's history. The national flag floats over all the public school-houses, planting in the minds of the young the lessons which it suggests, and thus inspiring a love of country and its institutions. Special instruction in the rights and duties of citizenship is made one of the principle features in the university, normal and public schools.

THE LIQUOR TRAFFIC.

Like all frontier countries, Arizona has her full quota of drinking saloons. According to the United States Treasury report for the fis-

cal year ending June 30, 1892, there were retail liquor dealers, 666; wholesale liquor dealers, 9; retail dealers in malt liquors, 13; wholesale, 24. The majority of these saloons have gambling-hall attachments. The license paid by all saloons in cities, towns, and villages in the Territory is \$200 per annum; outside of those, \$40. It will be seen that if the \$200 were paid on all saloons the aggregate would be \$133,200 per year. As a return for this the following statement from M. F. Shaw, assistant superintendent of the Territorial Prison, as to the cause of the crimes committed by the inmates, will prove instructive. Of 143 inmates, 77 can trace the cause of their crimes to drink. An investigation into the prisons of the respective counties of the Territory shows an average of more than 60 per cent of the inmates victims of drink. The average in the county hospitals will reach 50 per cent. As an illustration, the cost of maintaining the hospital of Mohave County for the quarter ending June 30, 1893, was \$2,695.65, and it is stated on good authority that every county patient except one had been brought to the institution by reason of drink, and this county has the smallest population and least taxable property of any in the Territory. The records of the Insane Asylum show an average of 25 per cent of the inmates whose insanity is due to drink. It is also estimated that the cost of maintaining the criminal courts of the respective counties, including fees of officers with the expense of maintaining the prison, hospitals, etc., creates more than 60 per cent of the cost of the county government. Thus it will be seen that by far the greatest bill of expenses entailed upon the county and Territorial government is the result of the drink habit. This fact more than anything else explains the debt of the respective counties of the Territory.

It is hard to understand why a government so enlightened and a people so progressive will license, protect, and encourage a traffic which gives no other result than the ruin of its patrons in morals, health, and finances, and imposes grievous burdens upon every department of state, fills the jails, hospitals, and insane asylums, and drapes the land in gloom. While in the states this traffic is beyond the power of the Federal Government, yet in the territories it has the power to lay its hand on it and suppress it. If this were done two years would not have passed before the Territory would have cleared itself of its debt and have reduced its rate of taxation more than half.

POLITICAL STATUS OF ARIZONA.

Political parties are not as well defined in Arizona as they are in the settled states. A large share of the population is made up of men of strong individuality, drifting in from all sections of the country; independent in thought as well as in action, liberal in their views, and consequently lacking the bias and prejudice often found among less observant people. Hence as a rule their allegiance to the orthodox political parties is more or less uncertain. Their independence in political matters is evidenced by the introduction of the Australian ballot system, which has been in vogue for the last three years. While it is true that during the last twenty years but one delegate has been sent by the Republican party to Congress from this Territory, the legislatures, as a rule, have been pretty equally divided. In the last legislature, however, the Democrats had a majority of two-thirds in both houses. The annexed returns of the vote at the last election will give an idea as to the standing of the two parties.

Congress.	Councilman at large.	Council.
APACHE COUNTY.		
Smith.....D. 424 Stewart.....R. 437	Norris.....D. 431 Cluff.....R. 406	Hunt.....D. 370 Hubble.....R. 470
COCONINO.		
Smith..... 326 Stewart..... 548	475 385	Daly.....D. 398 Nellis.....R. 460
COCHISE.		
785 461	635 570	Bruce.....D. 538 Cheney.....R. 685
GRAHAM.		
621 262	496 342	Shannon.....D. 494 Dunlap.....R. 621
MARICOPA		
1,368 930	1,311 950	Smith.....D. 1,112 Smith.....R. 1,016 Clanton.....P. 174
MOHAVE.		
235 241	208 234	Dennis.....D. 274 Hardy.....R. 232
PINAL.		
283 258	241 251	Chamberlain.....D. 218 Doran.....R. 305
PIMA.		
691 628	647 619	Lovell.....D. 662 Grant.....R. 532 Banes.....P. 104
YAVAPAI.		
1,090 953	1,074 922	Hawkins.....D. 1,059 Head.....R. 959
YUMA.		
182 145	144 152	Nugent.....D. 236 Dorrington.....R. 109
GILA.		
393 285	390 251	} Not known.

Assembly Dem.	Assembly Rep.	People's Ticket.
APACHE COUNTY.		
Martin 410 Dryden 414	Bushman 381 Freeman 406	} None.
COCONINO.		
Ross 409	Fulton 289	Roden 147
COCHISE.		
Gray 685 Tevis 634 Reilley 641	Nichols 537 Wright 634 Pool 549	} None.
GRAHAM.		
Goodwin 271 Skinner 479	} None	{ Leitch 379 Brewer 485
MARICOPA.		
Rogers 1098 Morgan 1034 Hurley 1178 Baxter 1222	Street 1080 Watrous 897 Marshall 1107 Pease 910	Mosier 196
MOHAVE.		
Collins 180	Southwick 184	South 151
PINAL.		
Sabin 175 Day 274	Graham 206 Loss 235	} None.
PIMA.		
Meehan 599 Bruce 565 Brichta 460 Leatherman 583	Morris 525 Schumacher 582 Magee 467 Chenowith 558	Noon 232 Harrington 160 Hoskins 113 Dyer 87
YAVAPAI.		
Burke 1054 Behan 1156 Betson 906	Cook 908 Fuller 970 Aley 826	} None.
YUMA.		
Field 189	Bloomer 126	Nono.
GILA.		
Not known	Not known	Not known.

It will be observed that the contest in the various counties was in most cases exceedingly close, so close that less than 200 votes would have reversed the majority in both houses. The Mormons cast a vote of about 1,500, which in previous elections had been given to the Democratic party, but which at the last election was divided, from one-third to one-half going to the Republicans. The reason for this change is not known, but various causes are assigned for it, the principal being that a Mormon was given a place on the Territorial Republican ticket. How the vote will be cast in the future is a matter of conjecture. I am persuaded that the conduct of the present Territorial administration will prove a most important factor in the future political status of the Territory.

STATEHOOD.

The paramount question with the people of Arizona to-day is that of statehood. For many years our people have longed for this inalienable right guaranteed by the genius and spirit of our system of government. Territorial rule is an anomaly in a government by, of, and for the people. Two years ago, by authority of the legislature, delegates were elected to a constitutional convention. The convention met and framed a constitution, which was adopted by the following vote :

Counties.	Yes.	No.	Total.	Majority.	
				For.	Against.
Apache	397	84	481	313	.....
Cococino	107	172	279	.....	05
Cochise	688	233	921	455	.....
Gila	227	209	436	18	.....
Graham	703	127	*848	578	.....
Mohave	219	58	277	161	.....
Mariocopa	1,357	370	1,727	987	.....
Pinal	177	161	338	16	.....
Pima	786	202	988	584	.....
Yuma	156	115	271	41	.....
Yavapai	621	551	1,172	70	.....
Total	5,440	2,282	7,728	3,223	05

* Sixteen rejected for informalities.

Arizona has the population and the taxable property to entitle her to the right of self-government. Her people have passed through the ordeal of conquering this Territory from savagery to civilization. Less than a quarter of a century ago the entire Territory was in the hands of the Apache Indians. Now, after a struggle of many years, in which a large number of pioneers and many of their families were sacrificed, thousands of families have established homes in our mountains and valleys. In place of the war whoop, the voices of children in the schoolhouse are heard, and on the Sabbath the churches, whose spires point heavenward, resound with the same songs of praise and devotion as ascend from the churches in the far-off Eastern States. All kinds of humanizing influences have taken hold upon the Territory—commercial, educational, reformatory, and religious. The arid plain is made to yield to the industry of the farmer and is dotted with gardens and orchards everywhere. The Indian goes on his raids no more, but is gathered into the reservations, and in place of plying his trade with the scalping-knife and deadly rifle he is engaged in tilling the

soil and his children are being educated in the schools. Many of the States admitted during the last forty years had no greater population than Arizona has now, no more developed and much less undeveloped wealth, not as many schoolhouses, churches, or refining agencies. Our people have trodden the winepress of suffering in order to reach that promised hope written in the Constitution of our country—*self-government*. The citizens of the older States should be mindful of the fact that our people are their people; the population which stands to-day knocking for admission to statehood is made up of the sons and daughters, the sisters and brothers of those in every State in the Union.

It is urged by some that we have a debt upon our hands. It is true, a debt of \$3,000,000, but it must be remembered that this debt, which includes Territory, counties and municipalities, is only a small part of the cost of the reclamation of this region to American civilization and all it means. In lieu of it we have given to the States the sum of \$94,000,000 out of our mines alone. Could any other Territory, when claiming admission, show a better record than this?

Objection has been raised to our Mormon population. This population does not exceed one-eighth of our people, and it must be added there is no more thrifty, temperate, industrious, or better disposed body of citizens in the Territory. The practice of polygamy is now unknown among them. They have done as much to bring about the prosperous conditions with which Arizona is blessed to-day as any other section of the community, especially in the reclamation of the soil by irrigation, of which they are the acknowledged masters and the pioneers in the United States.

It is likewise urged that Arizona is a strong Democratic Territory. A consideration of this kind is not in keeping with true patriotism. Apart from this, however, the statement is erroneous. Arizona to-day is doubtful; it has been doubtful for a number of years. By a careful analysis of the vote recorded at the last election, which gave the legislature to the Democratic party by a majority of two-thirds, it is shown that with a reversal of less than 200 votes the same majority would have been given to the Republican party. This ought to be sufficient evidence to that party that it would have an equal show in the contest for the control of the State government. Hence there should be no objection from this source.

Again, it is claimed that Arizona is a silver Territory and that, as a State, her vote would be given in the interest of silver as against gold. This claim is likewise an error. Arizona is to-day more of a gold than a silver producing Territory. Her gold production was more than treble her silver production last year. From the present outlook her yield of gold will be ten times greater than that of silver this year.

But it is said that her debt would indicate she has not shown her capacity for self-government. I would remind those who advance this argument that with statehood, and the arid lands placed at our disposal, with the power to raise money to reclaim them, Arizona would soon have an amount of taxable property which would not only redeem the Territory from debt, but would, in a very few years, reduce the rate of taxation to the minimum.

Statehood, moreover, would excite a spirit of patriotic pride among the people. The responsibility of self-government would inspire in the people loyalty to those elected by them to administer public affairs. Statehood would create a State pride among all classes of citizens and among our children, especially the native born. It would give the

people a direct interest in the Federal Government, in national legislation, in the general welfare of the union of States of which Arizona would be one. Every sentiment of justice, the principles struggled for by the Revolutionary fathers, the admission of every State into the Union for the last half century, is a declaration of Arizona's right to statehood.

CONCLUSION.

To sum up, no one who looks at the condition of Arizona with impartial eyes, to-day, can fail to acknowledge her rapid approach to the condition of prosperity of the older States. Her advancement is of that character which is the best guarantee of permanence—gradual, steady, solid. Side by side with her material progress is her intellectual, social, and religious. It has been shown that during sixteen years the sum of \$94,000,000 has been taken out of her mines, and the fact that during the present year her gold output will reach the sum of \$6,000,000 demonstrates that her gold-mining industry never looked so bright as it does at this time. The development of agriculture and horticulture is equally remarkable. The extent of the new irrigation enterprises will be seen by a reference to the portion of the report devoted to that subject.

To turn from the material to the intellectual, social, moral, and religious: For the support of our public schools we pay more than \$140,000 per annum. The liberal salaries paid to teachers, an average of \$79.77 per month, secure for the education of our children talent equal to that of any State in the Union. Our normal school turns out every year a corps of teachers fit for the highest positions in their profession. Our university has in its different departments professors equal to those employed in any similar institution in the East. The school of mines, the school of agriculture, and the U. S. Experiment Station are doing a work for the development of the territory which enables the farmer and the miner to reap the greatest reward from the valleys and the mountains, which nature has so bountifully supplied with riches. Our churches, Sunday schools, and charitable organizations keep pace with the growth of our population. In a word our people are typically American. While we are not free from that block to the progress of the world—the saloon—yet its presence is counteracted by temperance associations and other institutions which are fast bringing it to the position where, like other social evils, it is banned by all who have a regard for the good opinion of the community.

Among the recommendations which the report contains is one with reference to the Colorado River and another relating to the arid lands. This latter, of course, is a subject upon which Congress will not be apt to legislate for one Territory alone. I believe, however, that if the lands were ceded under some such conditions as those I have named it would result in equal advantage to our people and to the National Government. The opening up of the Colorado River to the Gulf of California, an improvement which could be effected at a small outlay, would give to the Territory a waterway not only to the Pacific coast, but to the seaports of the world. The plea for statehood voices in varying words the sentiments and arguments of our people. Congress has been given some idea of our struggles in the past, of our victory over difficulties which seemed almost insurmountable, of our present prosperity, and of our still brighter hopes. Our exact political standing has been shown. If any such consideration as politics could play a part in the decision of

Congress on our plea, the facts which I have given prove that there is no reason why one party or the other should obstruct our path to the goal which we have been endeavoring so long and so earnestly to reach. I have stated some of the many grounds upon which our people base their prayer for admission to the Union. The rest lies with the national legislature. I can only give expression to the earnest hope—and in this I but voice the feelings of a majority of our citizens—that the prayer may be favorably answered at an early day.

Very respectfully, your obedient servant,

L. C. HUGHES,
Governor of Arizona.

Hon. HOKE SMITH,
Secretary of the Interior.

SUMMARY OF RECOMMENDATIONS.

1. That the public lands be ceded to the Territory or State.
2. Increased protection of the customs border.
3. Legal tenure of grazing lands.
4. Appropriation for experiments in school of mines.
5. Discontinuance of Indians as soldiers.
6. More general appointment of military Indian agents.
7. That the San Carlos coal fields be segregated from the White Mountain Indian Reservation and opened for settlement.
8. That the abandoned military post and buildings at Fort Lowell be set apart as an Indian industrial school.
9. That Indian children be educated in the Territory.
10. Reduction of the Colorado River Indian reservation.
11. That appropriations be made for the supplying of water to the several Indian reservations for irrigation purposes.
12. That the boundary lines of the Indian reservations be surveyed.
13. That the United States courts be given jurisdiction in the trial of all offenses committed by Indians, etc.
14. That Indian depredation claims be speedily settled.
15. Extension of the geological survey to Arizona.
16. That the mileage of United States jurors and witnesses be increased.
17. Improvement of the Colorado River.
18. Appropriation for Federal buildings.
19. Appropriation of \$40,000 due the Territory for the Territorial penitentiary.
20. That the Government take cognizance of the cost and danger to the Territory of the liquor traffic.
21. That 2,000 acres of land adjoining the Territorial prison be set apart for the use of that institution.
22. The survey of the lands within the grant of the Atlantic and Pacific that they may be utilized for the purposes of taxation.
23. That the Arizona camels be sent to some National park.
24. That the Arizona petrified forest be set aside as a National park.
25. That appropriations be made to pay the Federal officers the salaries and expenses provided for by law under section 1845, Revised Statutes of the United States.
26. That Arizona be admitted to statehood.