# RESOURCES

OF

# PINAL ✳ COUNTY

ARIZONA.

PREPARED FOR THE

## Special Senate Committee

ON

## ARID LANDS.

By Authority of the Board of Supervisors.

FLORENCE, ARIZONA:
ENTERPRISE JOB ROOMS.
1889.

# RESOURCES

— OF —

# PINAL COUNTY,

## ARIZONA.

PREPARED FOR THE

## Special Senate Committee

— ON —

## ARID LANDS.

By Authority of the Board of Supervisors.

FLORENCE, ARIZONA:
ENTERPRISE JOB ROOMS,
1889.

UNIVERSITY OF ARIZONA
HC9791
P645
59m
LIBRARY

FLORENCE, Pinal County, A. T., August 31, 1889.

HONORABLE SIRS: The undersigned committee, appointed by the Board of Supervisors to furnish data concerning the resources of Pinal County for submission to your honorable committee, beg leave to present the following statement of facts, with accompanying maps and illustrations, for your consideration.

We have the honor to be, with greatest respect,

RICHARD E. SLOAN, *Chairman*,
WILLIAM E. GUILD, *Secretary*,
JAMES M. HURLEY,
PETER R. BRADY,
WILLIAM H. BENSON,
JOSEPH H. KIBBEY,
GEORGE W. BROWN,
*Committee.*

*To the Special Senate Committee on Arid Lands.*

81034

# INDEX.


Appendix ..... 19
Buttes Reservoir ..... 17
Florence ..... 8
Geology ..... 10
Irrigation Statistics ..... 15
Meteorological Statistics ..... 6
Political Organization ..... 5
Products ..... 8
Valuation and Taxation ..... 7


# ILLUSTRATIONS.


Lower Basin from Dam No. 2 ..... Oppo. 6
Cross Section No. 2 ..... " 10
Upper Basin from Middle Narrows ..... " 14
Site of Dam No. 2 ..... " 20

# POLITICAL ORGANIZATION.

PINAL COUNTY was originally formed from portions of Pima, Maricopa, and Yavapai Counties, in 1875. Subsequently the county of Gila was organized from portions of Pinal and Maricopa Counties, and it now contains an area of 5,368 square miles, or 3,435,520 acres, one-third of which could be made productive by a systematic storage of the surplus water now running to waste. It is one of the central tier of counties comprising the great agricultural belt of the Territory, and is traversed from east to west by the Southern Pacific Railroad.

The Gila River, which rises in the mountains of New Mexico and flows in a westerly direction through Arizona to its confluence with the Colorado River at Yuma, enters Pinal County about midway of its eastern boundary and courses in a southwesterly direction for twenty miles, where it is joined by the San Pedro River, which enters the county at its southeast corner. From the point of junction the river flows in approximately a western course for a distance of eighty-two miles to the western boundary of the county.

The San Pedro Valley lies upon both sides of the river of that name, and is forty miles long by an average width of two miles. Not more than ten thousand acres of this valley have been put under cultivation.

From a point on the Gila River five miles west of the mouth of the San Pedro, for a distance of twenty-five miles, no farming is attempted on either side of the river, and could not be made profitable if so attempted, owing to the narrowness of the valley, which in this place takes the form of a gorge varying in width from one thousand feet to two miles,

its narrowest point being at the Buttes, fifteen miles east of Florence. From this point the Gila Valley proper begins and widens out rapidly, embracing all of the western portion of the county.

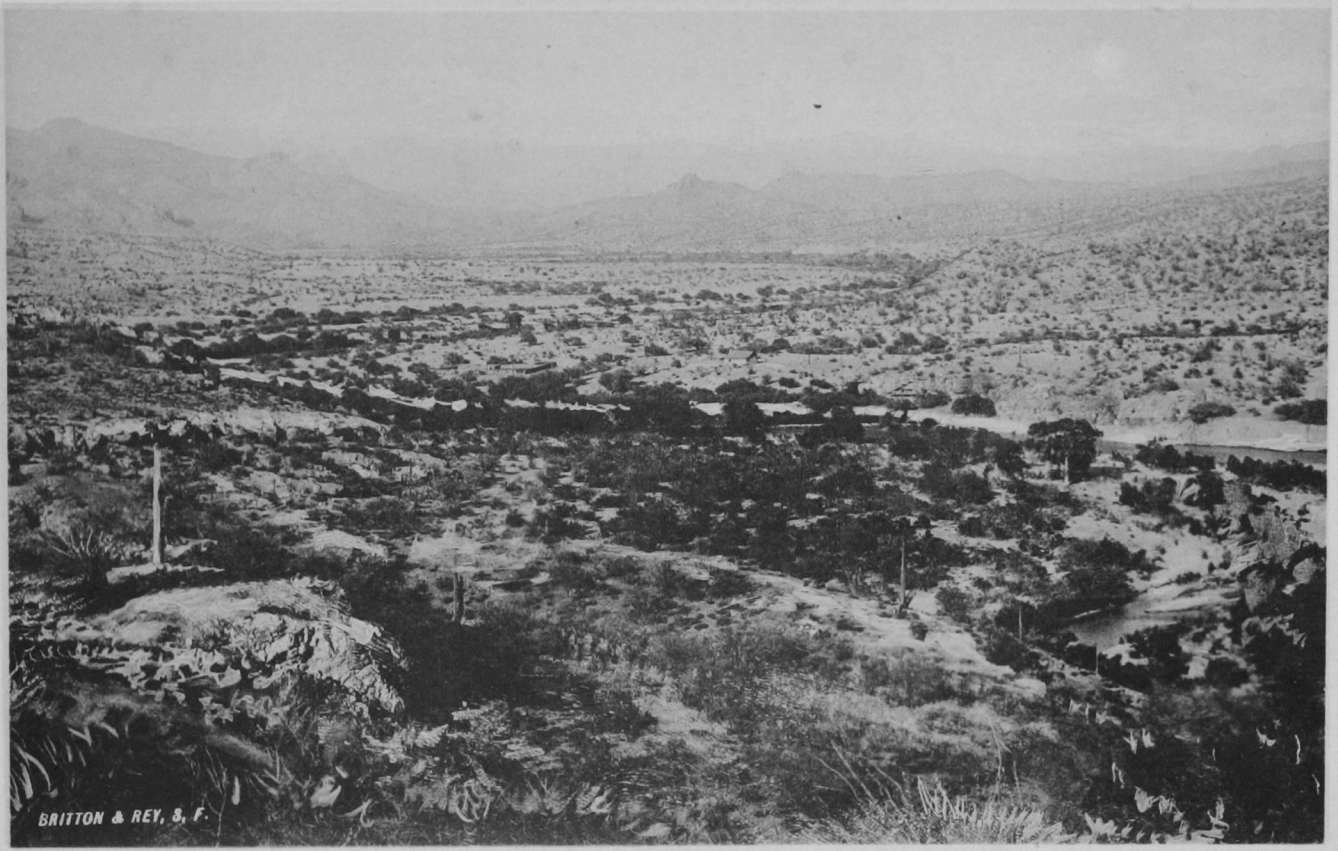
This whole valley can be irrigated from a storage reservoir located at the Buttes, and with an unfailing supply of water. It embraces an area of 921,600 acres of irrigable land, the title to ninety per cent of which remains in the United States Government. This land would come into market immediately should measures be taken to supply it with water.

The population of Pinal County at the present time is about 5,000, but with the whole of the Gila Valley under cultivation it would support an agricultural population of 150,000 people, with an equal number in its cities and villages.

## METEOROLOGICAL STATISTICS.

The signal service of the general government maintained a station at Florence from 1874 to 1882. The reports covering the period from July, 1880, to April, 1882, give the following statistics, which may be taken as a safe guide to the prevailing temperature, which varies but little from the mean temperature given during the series of six years:—

| 1880 | WASHINGTON TIME. | | | | EXTREMES. | |
|---|---|---|---|---|---|---|
| | 7 A. M. | 3 P. M. | 11 P. M. | MEAN. | MAXIMUM. | MINIMUM. |
| July | 75.8 | 99.2 | 84.9 | 86.6 | 111 | 61 |
| August | 77.4 | 97.5 | 84.6 | 86.5 | 112 | 60 |
| September | 70.2 | 93.7 | 79.0 | 81.0 | 107 | 48 |
| October | 56.7 | 82.4 | 64.9 | 68.0 | 96 | 32 |
| November | 42.0 | 67.0 | 47.3 | 52.1 | 80 | 25 |
| December | 42.6 | 63.2 | 46.9 | 50.9 | 77 | 27 |
| Year 1880 | 55.0 | 80.3 | 63.9 | 66.4 | 112 | 27 |




Lower Basin from Dam No. 2.

| 1881 | WASHINGTON TIME. | | | | EXTREMES. | |
|---|---|---|---|---|---|---|
| | 7 A. M. | 3 P. M. | 11 P. M. | MEAN. | MAXIMUM. | MINIMUM. |
| January | 36.2 | 59.1 | 41.7 | 45.7 | 78 | 21 |
| February | 42.9 | 67.8 | 53.3 | 54.7 | 85 | 21 |
| March | 39.9 | 70.5 | 53.7 | 54.7 | 93 | 29 |
| April | 55.1 | 83.9 | 68.4 | 69.1 | 100 | 48 |
| May | 59.5 | 92.7 | 71.8 | 74.7 | 104 | 45 |
| June | 66.8 | 102.5 | 81.0 | 83.7 | 113 | 44 |
| July | 76.9 | 100.8 | 86.2 | 87.9 | 112 | 64 |
| August | 76.4 | 94.7 | 82.5 | 84.5 | 110 | 62 |
| September | 66.1 | 91.4 | 75.0 | 77.5 | 103 | 50 |
| October | 55.9 | 82.2 | 64.0 | 67.4 | 98 | 36 |
| November | 40.6 | 68.5 | 48.2 | 52.4 | 80 | 26 |
| December | 41.5 | 66.7 | 48.5 | 52.2 | 81 | 28 |
| Year 1881 | 54.8 | 81.7 | 64.2 | 66.9 | 113 | 21 |

| 1882 | WASHINGTON TIME. | | | | EXTREMES. | |
|---|---|---|---|---|---|---|
| | 7 A. M. | 3 P. M. | 11 P. M. | MEAN. | MAXIMUM. | MINIMUM. |
| January | 38.1 | 57.5 | 43.6 | 46.4 | 79 | 23 |
| February | 41.0 | 59.8 | 47.6 | 49.5 | 72 | 27 |
| March | 44.3 | 71.9 | 5 .7 | 57.3 | 92 | 25 |
| April | 47.4 | 78.0 | 60.8 | 62.1 | 100 | 32 |

During the years above quoted, the average rainfall per year was 10.28 inches.

## VALUATIONS.

The following is the assessed valuation of property of all kinds in Pinal County for the past three years, with rate of taxation.

1887—Valuation, $1,701,802.48; rate, $2.70 per $100 valuation.
1888—Valuation, $1,830,170.30; rate, $2.63.
1889—Valuation, $1,813,136.62; rate, $2.75½.

It is confidently asserted that when the whole of the Gila Valley is under a moderate degree of cultivation, the assessed valuation of property will be increased to $20,000,000, and the rate of taxation correspondingly lowered.

## FLORENCE.

Florence, the county seat, latitude 33.03 north, longitude 111.19 west, and 1,553 feet above sea level, is a town of about 1,500 inhabitants, and situated near the Gila River, twenty-six miles northwest of the railroad station of Casa Grande. It has many handsome private residences, several brick stores, and the usual accessories of a frontier town. It has an excellent graded school employing five teachers, churches, several secret societies, a bank, two newspapers, and a handsome new court-house to cost $30,000 will shortly be erected. Streams of water flow along either side of the streets, and numerous shade trees impart an air of comfort upon even the warmest days.

## PRODUCTS.

But very few years have elapsed since the industry of the farmer in this valley was solely directed towards the production of the few simple requisites of home consumption, and if the horticultural possibilities of the valley were thought of at all, they intruded only as pleasant dreams.

Beyond the production of hay and cereals little advance was made until a few years ago, when experiments in fruit culture were undertaken in a modest way and with varied results.

Sufficient is now known to form the basis of intelligent calculation of the desirability and value of many species in cultivation, for the guidance of those about to cultivate land.

The grape is especially adapted to this soil and climate, where it reaches almost perfection in quality and abundance in quantity. Unusual saccharine qualities are developed, which especially adapt them to table use and in raisin making. Nearly every variety of grape so far tested grows luxuriantly

in this valley, and it is clearly evident that raisin culture is destined to become a prominent industry. Two crops of grapes often grow in a single season, and ripe grapes have been picked from the vines in the open air, but in very limited quantities, in January, but such a circumstance is rare.

The fig thrives remarkably well, bears heavily, withstands neglect, and is a source of great profit to growers. From two to three crops per year are gathered. It bears the second season from the cuttings.

The apricot, peach, nectarine, plum, prune, pear, early apple, quince, mulberry, date, pomegranate, cherry, and all the small fruits and berries, are grown, while almonds, walnuts, and pecans thrive exceptionally well.

Culture of the citrus fruits has been undertaken only recently, and at this time it promises to prove a success. Several orange orchards will be planted the coming winter, and it is believed that a little extra care taken during the first season will insure their successful growth.

The absence of all fogs and nightly dews is a formidable obstacle to the existence of the destructive and unsightly scale-bug, and the fruits of the valley are all bright and clean.

The season is somewhat in advance of that of Southern California, which gives fruit growers an appreciated advantage in the early markets.

All the agricultural products of the temperate zone are easily grown here, the long seasons giving a succession of crops that double or treble the productive value of the land.

Wheat and barley are largely produced, although they are amongst the least profitable crops under the irrigating system. A careful estimate of the cost of carrying through to a marketable condition a field of wheat or barley, including rent on the value of the land, gives $13 per acre as the average. Wheat yields about 1,500 pounds per acre, and therefore costs eighty-five cents per cental, and barley yields about 1,800 pounds per acre and costs seventy-five cents per cental,

leaving a very small margin of profit. During the season of 1889 the valley produced fully six millions of pounds of grain.

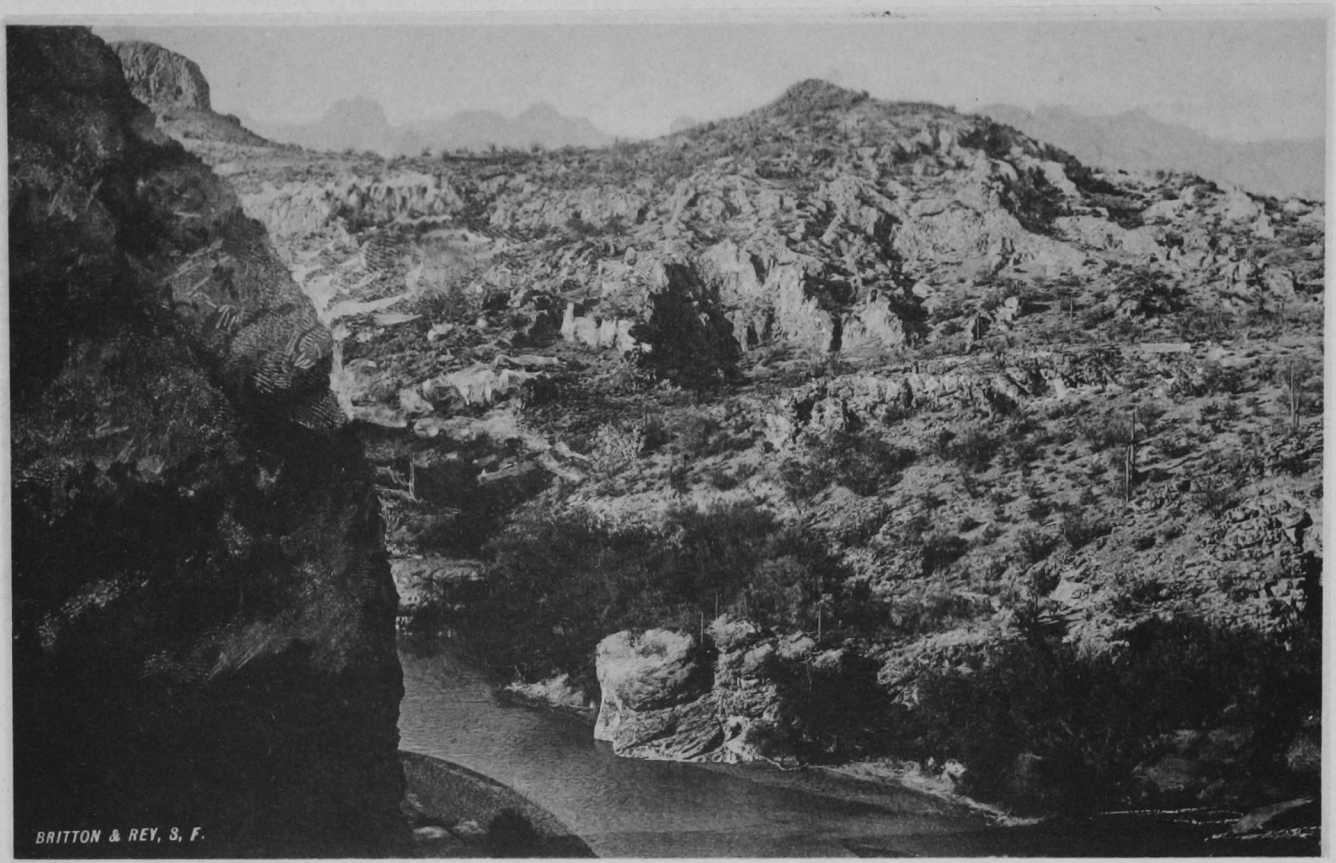
Alfalfa is the most productive and profitable forage plant in the valley, and produces, under different conditions, from one to three tons of hay per acre at each cutting, and from three to five cuttings per year. After a field of alfalfa is once well established the cost of hay in the stack will be about $2.50 per acre. In exceptional instances as high as four tons of alfalfa hay per acre have been cut, and five or six cuttings made in a single season, but this is more than double the average. The hay crop of the past season aggregates approximately one thousand tons.

The home market afforded by the adjacent mining camps has consumed the surplus products of the valley in past years, but the constantly increasing acreage coming into cultivation will encourage the exportation of the large fruit production that will eventually form the principal industry of the valley.

## GEOLOGY.

Geologically, Pinal County affords but limited opportunities for observation, as the greater part of its area is covered by quarternary deposits. Only the extreme eastern portion contains mountain ranges, which give an insight into their formation at best very limited and confined to cursory observations.

The north spur of the Santa Catalina Mountains enters the southeast corner of the county, its bare granite peaks, probably devonian, being flanked on the east by quartzites (triassic) and carboniferous limestones, and on the west by schists, cretaceous and tertiary shales, intersected by dikes of trachyte and diorite. The east side shows fair prospects of copper and lead ores, while the west side has numerous gold prospects of more or less extent and value, extending to the San Pedro River.




CROSS SECTION NO. 2.

Still farther north, beyond the San Pedro, is the Saddle Mountain Range. Porphyritic granites, syenites, and schists are the prominent rocks, probably devonian, seamed with numerous fissures of silver ores containing a small percentage of gold and argentiferous lead ores.

Immediately adjoining, and to the east, are the Deer Creek, or San Carlos coal fields. The formation here is carboniferous limestone and cretaceous sandstone, pierced by dykes of rhyolite and andesite, and frequently capped by the same The limited developments have been confined to the east end of the known basin, which is about seven miles long, and at an altitude of 2,000 feet above sea level. But little coal has been developed, as most of the veins are bituminous shale, with partings of coal. However, as the veins, running about E. N. E. and W. S. W., have a very steep pitch, 42° from the vertical, better coal may be encountered with depth, unless the injected igneous dykes proved very destructive, as the deepest shaft shows nearly one foot of bituminous coal, containing about twenty per cent of ash, ninteen per cent of volatile matter, and sixty per cent of fixed carbon. In a region where timber growth is sparse, in due time this coal and shale will prove an advantageous fuel.

Crossing the Gila River and ascending Mineral Creek we find carboniferous limestones and quartzites mostly covered by rhyolite. Here valuable copper as well as argentiferous lead deposits crop to the surface. The ore bodies are large, strong, and promising.

Passing northeast into the Pinal Range of mountains, which reach an altitude of 3,925 feet above sea level, at the head of Pinal Creek, we encounter chiefly archæan and silurian granites superimposed near Florence by mica schists and slates, cretaceous, frequently pierced or covered by eruptive dykes of rhyolite or pearlstone, and, according to Lieut. Geo. M. Wheeler's survey, triassic rocks along Pinal Creek. Numerous veins of ore of more or less value crop to the surface, of which the most prominent are at De Noon, the northern end

of the Mineral Hill district. These are fissures averaging from sixteen to twenty feet, between amphibole granite and schist, carrying chiefly chloride of silver and some sulphide of the same metal in a highly manganiferous calcareous gangue.

Proceeding north, carboniferous limestones join the older syenites and granites, and we pass to Silver King, a mine that is now a part of the history of the Territory. The peculiar fissure of this mine is absolutely unique to this day, and consequently no criterion for others in its immediate vicinity. In the eastern part of the Pinal Range are many promising prospects.

In the southwest portion of the county are low rolling ranges of devonian or carboniferous limestones and quartzites capped in many places with rhyolite. Copper, silver, and lead deposits abound, and the ores are of good grade. The most developed mine is the Vekol, carrying free milling chloride of silver ore and a small percentage of carbonate of lead. To the east, over rolling lime ridges, is the Jack Rabbit mine, with a small but very rich vein, carrying chloro-bromides, and in the richest part, iodide of silver.

In the northwestern corner of the county the Sierra Estrella flanks the Gila River, which here also forms the county line. The country rock consists chiefly of granite and gneiss silverian. But being upon the Pima and Maricopa Indian Reservation, little or no prospecting has been done.

"Cheaper labor and transportation, with capital to assist, will make many of the now known veins productive and profitable if placed under competent direction. Arizona has suffered greatly as a mining country either through dishonest or incompetent agents or managers, but in all cases where capable and reliable superintendents or managers were selected, success has crowned the investment.

"Mining is not different in principle from any other business. No sensible man will build a house without laying down a plan before he commences work, nor engage in any business

without culculating the costs and proceeds. If he neglects these precautions he will lose both his investment and his money. It is exactly the same in mining, and as the means for attaining the knowledge required for mining are not as frequent as in many other kinds of business, we may naturally expect there will be a less number of men well informed on mining, independent of the fact that the knowledge required is of the most complete character." *

" Going northeast from the town of Florence to Mineral Hill, the course of the Gila River is traversed for some miles over an alluvial soil, well watered and under cultivation. After leaving the river the country becomes broken into small hills of alluvial wash and conglomerate. The foot-hills proper of the mountains are underlaid with granite, through which veins of quartz traverse in a northwesterly and southeasterly direction. This quartz is associated with a high grade of cuperiferous ore.

" The heart of this district where the mines are situated is porphyry, which has been pushed up through the granite underlay, forming hills of very precipitous and rugged character in which the mineral-bearing leads are situated, having a trend from northeast to southwest, being well defined, and in place, and can be followed with ease by their croppings, which are very prominent to a great distance.

" These croppings are of quartz and iron, and in many instances project themselves above the surface several feet in height.

"The district is remarkable from the ease by which a lead can be followed, in many instances some thousands of feet. These croppings are of themselves valuable ore, and are an unerring index of what exists under the surface.

" In all instances the formation and leads are solid and in place, requiring little or no timbering; their position is such that they can be attacked easily, and economically, by either tunnel or level.

*Copied by permission from a report by Otto Metchke, C. E.

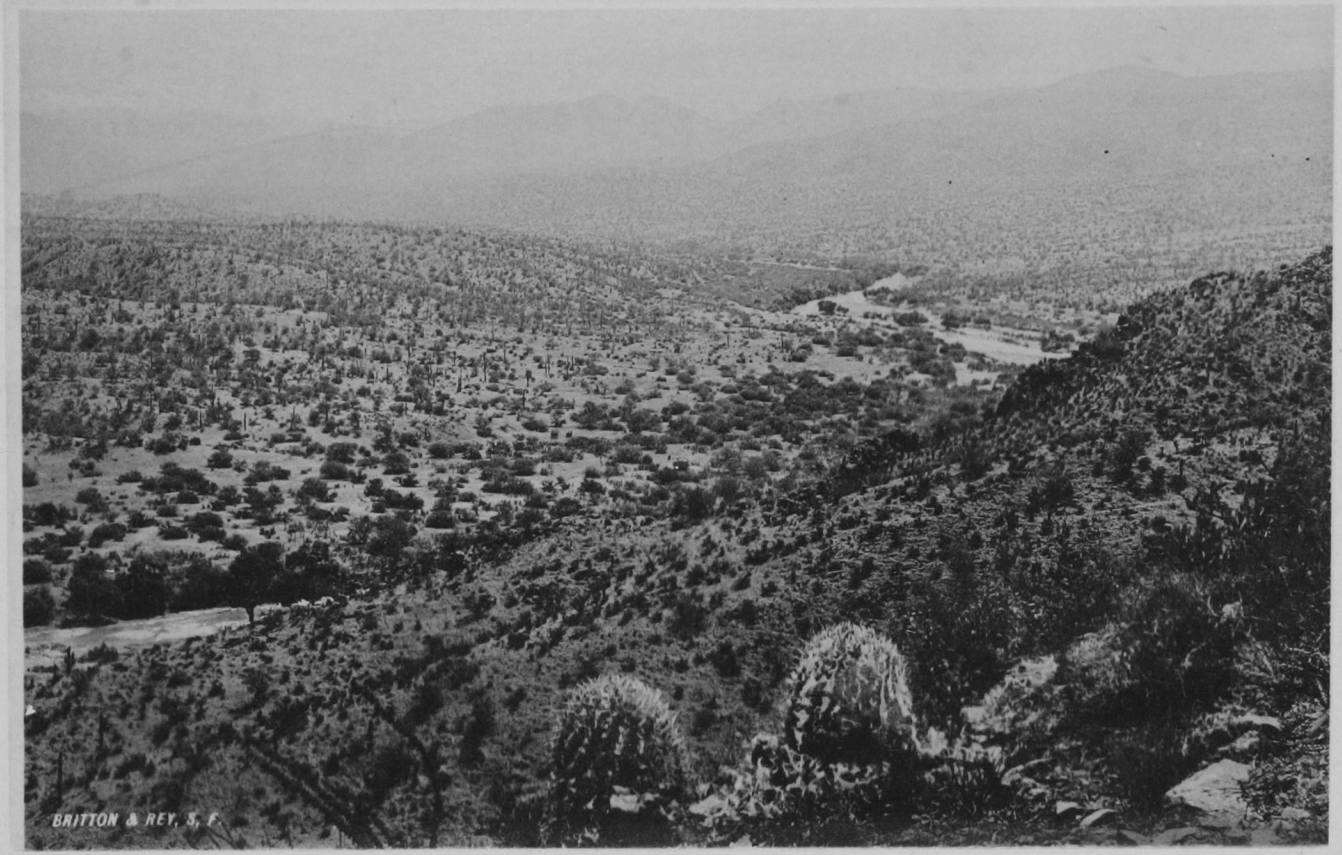
"Both formation and leads are very near a vertical, having but a slight pitch or inclination. The surface is covered to some extent with brush and grass, with a plentiful supply of scrub timber sufficient for all fuel purposes. Mineral Hill presents the appearance of an immense porphyry outcrop, surrounded by a semi-circle of granite and syenite, reaching from the northwest to the southeast of the district, cut by gulches of varying depth, in the principal ones of which there is running water most of the year." *

"The Owl Heads district is in the southeastern portion of Pinal County, about forty miles southeast of Florence. There are four different systems of lodes occurring in a mineralized zone extending from the northeast to the southwest, for a distance of five miles long by about two miles wide. The northern system carries copper with gold and silver in quantities that justify the shipment of ores to Eastern reduction works. The formation is chiefly porphyritic, lying between a volcanic formation on the north and a metamorphosed porphyritic granite on the south. The gangue of the lodes is spar and quartz.

"In the next belt south the lodes occur in connection with a large diorite dyke extending a distance of about five miles. The lode is found upon granite overlaid by black porphyry and thus by diorite. Large bodies of a fair grade of ore are found in this belt, and water is found thirty-five feet from the surface.

"In the next belt south the lodes lie upon the black dyke, with the diorite beneath and upon the metamorphic granite, and one of very high grade occurs. The principal mines being worked in this district are included in this belt. Permanent water is found at a depth of sixty-five feet, from which point the ores undergo a change from an oxydized, decomposed, reddish character at the surface to antimonial, arsenical sulphurate ores, accompanied by more or less blende. Native silver occurs quite freely below the water level.

* From a report by C. T. Gooding, M. E.




Upper Basin from Middle Narrows.

"In the southern belt the lode lies upon metamorphosed granite, and is overlaid by a blue dyke, over which lies the black dyke, and above this the diorite, which is some two hundred feet wide. This lode lies between two dissimilar formations, the metamorphosed granite, and the slate hills on the south, highly favorable for true fissure and permanent lodes.

"This mineral zone is bounded by a slate range on the south, on the east by decomposed, slaty hills, upon the north by a volcanic country, and upon the west by the level plain." *

## IRRIGATING STATISTICS.

Practically in Pinal County there are two irrigation districts, the Gila, above Florence, and the San Pedro country. Beginning just below the canyon, at the Buttes, about twelve miles above Florence, the ditches occur in the following order: On the north side:—

| NAME. | LENGTH. | ACRES. |
|---|---|---|
| Moore's | 3 | 300 |
| McLellan's | 3 | 300 |
| Sharpe's | 3 | 160 |
| Stile's | 4 | 300 |
| The Swiss | 2 | 200 |
| Totals | 15 | 1,260 |

On the south side:—

| NAME. | LENGTH. | ACRES. |
|---|---|---|
| Brash | 4 | 400 |
| Florence Canal | 43 | 60,000 |
| Montezuma | 6 | 1,000 |
| Pat Rolland | 7 | 1,000 |
| Alamo Amarilla | 7 | 1,000 |
| Brady | 4 | 1,000 |
| Adamsville | 4 | 1,000 |
| White | 3 | 200 |
| Walker and Dempsey | 3 | 300 |
| Totals | 81 | 65,900 |

* From a report by Wm. Clarke.

All the above ditches are private property, except the Florence, Montezuma, and Alamo Amarilla, which are incorporated.

There are three private ditches on the Gila, above Riverside and below the San Pedro, as follows:—

| NAME. | LENGTH. | ACRES. |
|---|---|---|
| Shields | 2½ | 480 |
| Winkleman | 1½ | 480 |
| Brannaman & Co | 1½ | 320 |
| Totals | 5½ | 1,280 |

On the San Pedro, west side, and in their order up stream, are the following ditches:—

| NAME. | LENGTH. | ACRES. |
|---|---|---|
| Lattin | 1 | 80 |
| Harrington | 1¼ | 480 |
| Swingle | 2 | 480 |
| Watermann No. 1 | 1½ | 320 |
| " " 2 | 1½ | 320 |
| Bates | 1½ | 160 |
| Pusch | 2 | 640 |
| Dodson | 2 | 320 |
| Cook | 1½ | 200 |
| Brown | 1¾ | 160 |
| Totals | 16 | 3,160 |

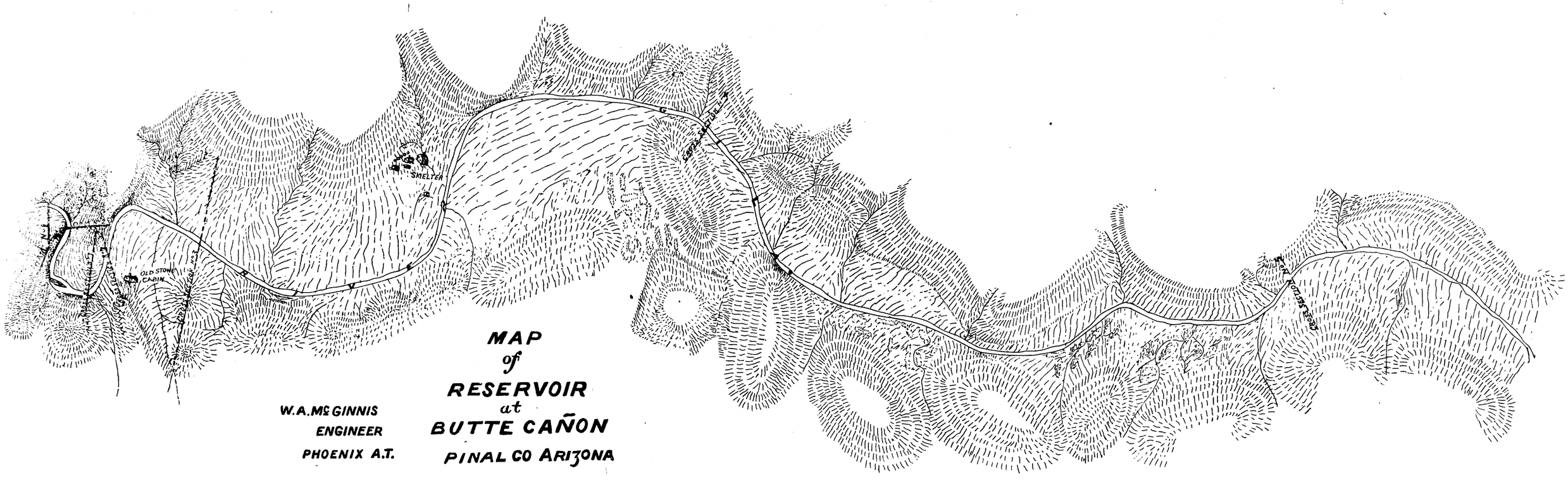
These are all private ditches. About half of the land covered by the above ditches, except the Florence Canal, is in actual cultivation.

The Florence Canal Company has a capital stock of $500,000.

The canal emerges from the river at a rocky point about a mile and a half below the canyon known as the Buttes.

Twenty-eight miles of the main canal have been constructed, and contracts for the remaining five miles have been made. Fifteen miles of laterals and service ditches are constructed.

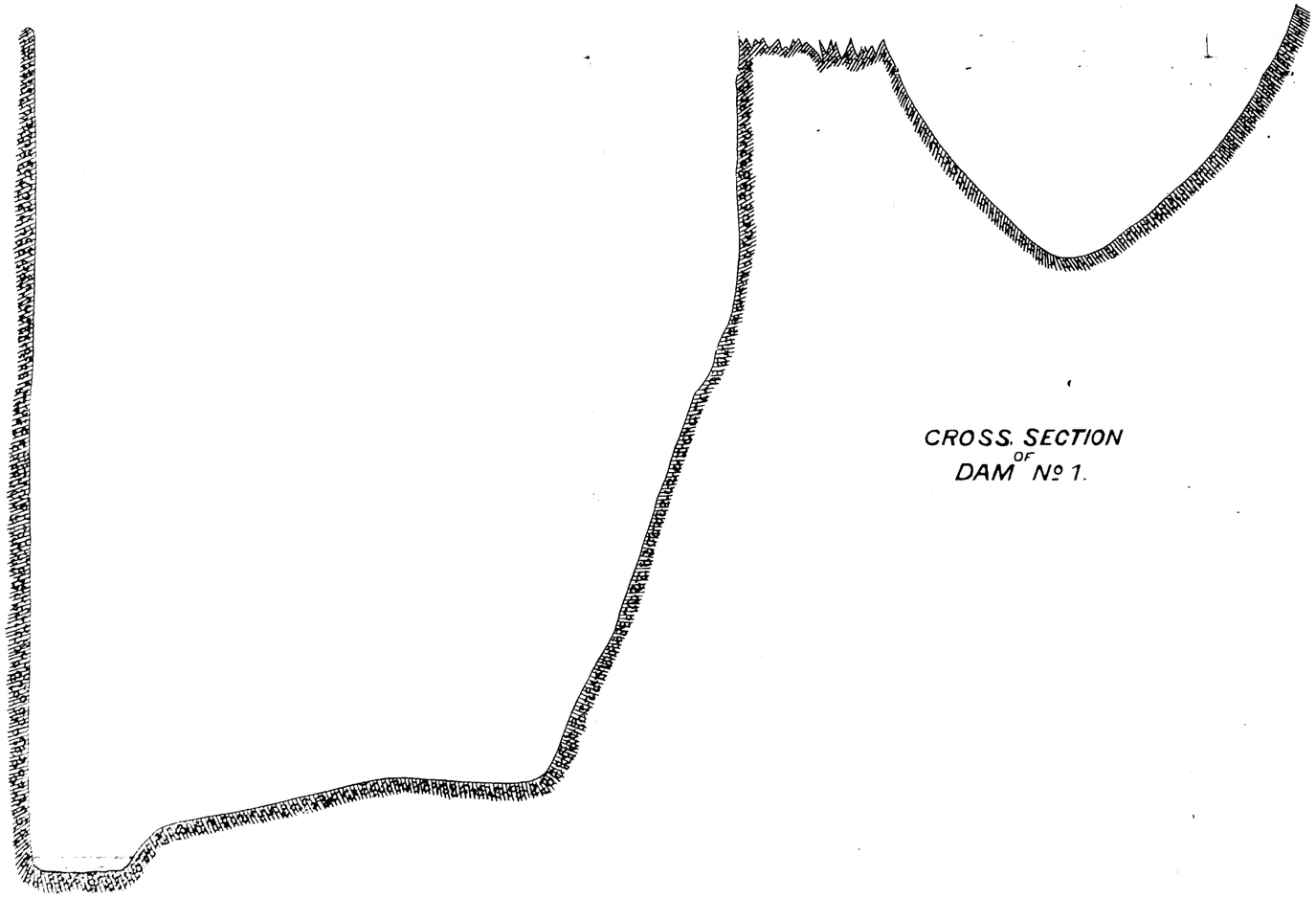
The main canal has a capacity equal to a flow of 440 cubic feet per second, and is so constructed that it can easily be enlarged and its capacity increased.



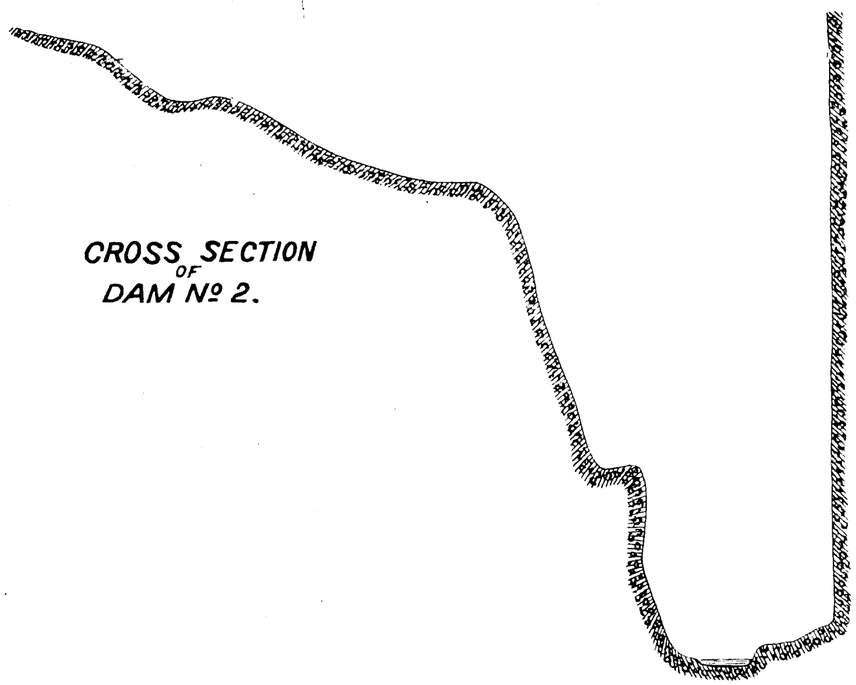

# MAP of RESERVOIR at BUTTE CAÑON

PINAL CO ARIZONA

W.A. McGINNIS
ENGINEER
PHOENIX A.T.



CROSS SECTION OF DAM Nº 1.



CROSS SECTION OF DAM Nº 2.

The company contemplates the building of storage reservoirs, one of which, at least, will be completed this fall. It will be situated about fifteen miles south of Florence, will cost $100,000, and have a storage capacity of eight billion gallons of water. There is a large catchment basin tributary to the reservoir, so that, with little trouble or expense, the reservoir can be filled at least once and possibly twice a year, independently of the river supply. There is now in cultivation under this canal 6,000 acres.

. . . . . .

The Florence Canal Company has also in contemplation as a part of its system the construction of a reservoir for storage purposes at the Buttes, by means of a dam. This, however, will in no manner interfere with the construction of more extensive works by others that will furnish an abundant supply of water for a very large area of land not reached by their canal.

---

# THE BUTTES RESERVOIR.

## THE ENGINEER'S REPORT.

FLORENCE, Pinal County, A. T.

*To the Hon. R. E. Sloan, Chairman—*

DEAR SIR: Having been employed by your committee to make a preliminary survey of, and make a report on, the Storage Reservoir, location in the Butte Canyon, on the Gila River, some fifteen miles above Florence, I have the honor to submit the following, with accompanying maps, profiles, etc., as the result of said survey:—

Beginning the survey at the lower, or dam No. 1., at a point about seventy-five feet below the small gulch that lies between the two precipitous buttes on the right bank of the river, running S. 12° 45′ E., across the valley and to an altitude of

two hundred feet, on the butte, on the south side of river; thence S. 9° 30′ W. across a depression or pass that lies between the buttes, which was found to have an elevation of 166 feet above the bed of the river. (See cross section of dam No. 1.)

The butte on right bank of river at north end of dam is vertical for about 350 feet, also the one on the left bank is of ample height for a 200-foot dam without further work, were it not for the low pass or depression that lies just south of the first butte, or the one on which the main dam would rest. This, of course, would have to be raised to the same height as that of the main dam, which, being 166 feet, would require to be raised 34 feet. On the meander line of river, 1,000 feet above dam No. 1, the location of dam No. 2 is made.

Beginning at a point under the butte on the left bank of river, the line runs across river and canyon, N. 73° 45′ E. The distance from bluff to bluff is 220 feet; here the bluff on right bank rises vertically to forty feet, when it slopes off at an angle of about 35°, until it reaches an altitude of 150 feet.

The butte on the left bank rises vertically to an altitude of about 325 feet.

At the right end of the dam line, there is a natural spill-way through which the surplus water can be discharged without coming in contact with the masonry of the dam.

Should dam No. 1 be built to a height of 200 feet, the spill-way would be at the left end, where the water would be discharged onto the solid rock below, or the spill-way could be cut through the rock at the end.

The survey of river, dams, and cross sections is made with magnetic variation of 13° 40′.

Time being limited, the valley was cross-sectioned only at points that would give the nearest mean cross-sectional area. (See cross sections Nos. 1, 2, 3, 4, and 5, and map.)

In the distance surveyed (7.5 miles) the river has a fall of 70.5 feet. At the same ratio the water impounded by dam

No. 2, 150 feet high, would extend up the river about 15.9 miles, and that by No. 1 about 21.25 miles.

From dam No 2, the first 7.5 miles will impound approximately seven billions cubic feet of water, and would supply a canal carrying 50,000 miner's inches of water, for a period of 82 days; and from No. 2, 200 feet high, for the same distance, it would impound fifteen billions of cubic feet, and would supply the same amount of water for 188 days; this is exclusive of the constant river supply.

Judging from the size of the numerous gulches and canyons leading into the river (which were not surveyed), one-fourth of the above amount could be safely added, making over eighteen billions cubic feet of water for the first 7.5 miles.

The 13.75 miles above cross section No. 5 not surveyed, with lateral canyons and gulches, can be safely estimated at a like amount, thus making the entire contents of reservoir when filled, thirty-six billions cubic feet of water.

For the construction of the dam at either location, rock and sand of the best quality and inexhaustible quantities are in the immediate vicinity. At both ends of either location quarries of fine stone can be opened on a level with the top of the dam, thereby saving the expense of raising and hauling.

From indications, bedrock at dam No. 1 is from 1 to 20 feet, and at No. 2 it will average about six feet below the surface. Respectfully submitted,

W. A. McGINNIS, *Engineer.*

# APPENDIX.

The fact is clearly demonstrated that the drainage of a water-shed, roughly estimated, and more than two hundred miles square, partly mountainous, which concentrates its water at the Buttes, fifteen miles east of Florence, is capable of supplying a quantity of water sufficient to irrigate from three-

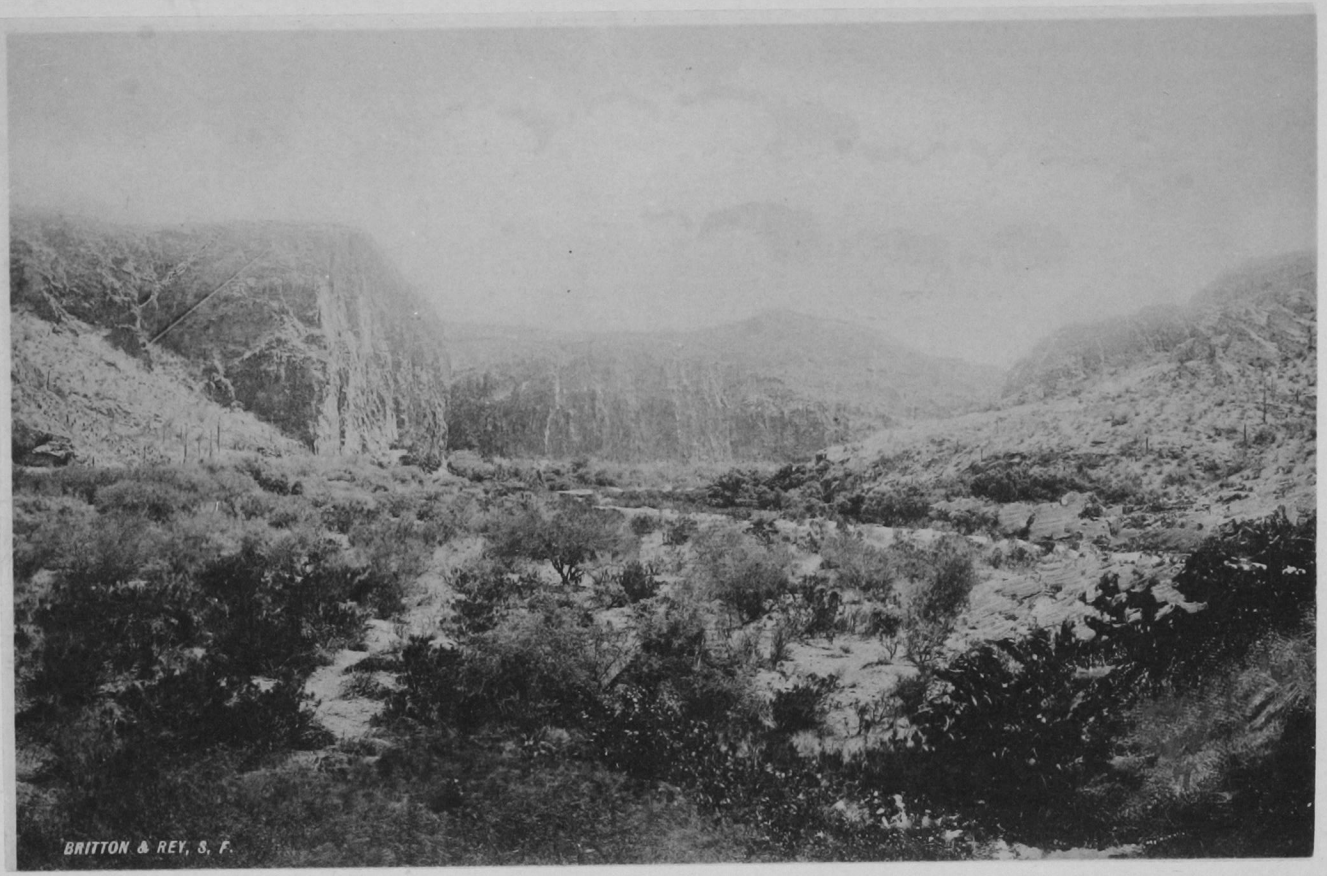
fourths of a million to one million acres of land. When it is shown that ten or twenty acres of vineyard or orchard is enough for the comfortable support of a family, and a satisfactory accumulation of wealth against future vicissitudes, the magnitude of this statement can be more easily realized. It will support a rural population of more than one hundred and fifty thousand people, and at an ordinary profit millions of money will be realized annually.

# PRESS EXTRACTS.

## Manifest Destiny.

There are some wonderful designs drawn upon the trestle-board of nature by the Master Architect, that fashioned the multitude of worlds of which we are but dimly conscious, which the boasted power of mankind can neither alter nor abate, and which in due course of time are wrought out in strict accordance with the most minute details of the divine plan. Among these, and quite insignificant when compared with the abstract magnitude of all creation, yet wonderful in human eyes, is the contemporaneous development of the means and opportunity for the fulfillment of new glories for the benefit of mankind.

Such reflections must naturally arise when one contemplates the history of the past and the possibilities of the future, and the idea is equally applicable to all the lesser affairs that begin, flourish, and end—the alpha and omega of the world and all thereon. Even in a local sphere we note the same rigid adherence to an occult plan that the efforts of mankind are apparently powerless to either accelerate or retard, and events fraught with important results come naturally about in their own good time when the ordained day is at hand.




SITE OF DAM NO. 2.

We can apply this principle to local circumstances that seem to verify its correctness in a very commonplace way. After centuries of dreamless sleep, the valley of the Gila River in this vicinity but recently awoke to the progressive influences of civilization. The same conditions for the sustenance of human life probably prevailed then as now, but the time was not ripe for the destiny reserved for it. Ever since the present generation began to till its soil and public attention was drawn to its abundant resources, the hand of development was retarded for some wise purpose, and the bountiful riches of its wonderful mines and prolific soil are still held in reserve for the enjoyment of future years.

But the day has at last arrived when the seal of its destiny is to be broken, and its golden doors opened to an admiring world. Immense reservoirs of water will be stored for the broad acres of arable land, and to drive the wheels of great works for the reduction of its ores, and homes and employment will be provided for hundreds of thousands of people, through the development of its great resources. Up to this time the best efforts of man have accomplished but little in the way of progress compared to its ultimate condition, and the knowledge has suddenly dawned upon investors that a new El Dorado has sprung into existence. All about our little town, in every direction, the mountains are seamed with inexhaustible quantities of the precious metals, that will, in the next decade, supply many thousands of busy stamps and blazing furnaces, while the peaceful valley will profit as greatly by the home market its products will command. There are twenty-three thousand acres of land embraced within a township, and the construction of the great reservoir at the Butte will give an available supply of water, with that to be derived from subterranean sources, sufficient for at least fifteen or twenty townships. Figure this out and you will express a surprise—nay, a doubt—that such a compact body of land exists in Arizona susceptible of irrigation. This on the one hand is a part of the support of the future city of Florence,

while its rich mines, extending from the Silver King up the San Pedro, in the Santa Catalinas, the Tortilitas, and south of the railroad, will contest the value of the annual agricultural products. Railroads are already projected to traverse this valley, giving an outlet to both the mines and the farms for their output, and busy scenes, beyond the imagination of the most sanguine, will transpire within Pinal County, whose latent resources are sufficiently grand for an empire.

Such is the manifest destiny of this favored valley, and, although its earliest settlers also recognized this fact, until now their best efforts to hurry forward its realization have been unavailing. The time is now ripe, and the change is at hand, and the evident design of the mystic power is about to be fulfilled.—*Arizona Enterprise, May 25, 1889.*

The entries of land under the Florence Canal now aggregate very nearly ninety thousand acres, of which fully ninety-eight per cent can be covered with water. About six thousand acres are under cultivation, and preparations are being made to prepare from ten to fifteen thousand acres the coming fall and winter. Of the acreage entered it is safe to estimate that seventy-five per cent will be cleared and tilled within the next two years, and largely planted to fruits. The land is the most fertile of any portion of Arizona, is free from alkali, and is especially adapted to the cultivation of fruits of all kinds, as well as the usual farm products of the temperate zone, including many semi-tropical productions. With such resources at our doors, there is every reason for our expressed faith in the immediate growth of Florence into a city of large size and importance. But beyond our substantial agricultural interests, there are other resources that must largely contribute to our prosperity. From the Silver King to the Gila River at the Buttes, and extending along the stream to Riverside and above, is one of the largest and richest mineral belts of the Pacific Coast; and when the huge dam at the Buttes is constructed, its prodigious water power will be utilized for the reduction of the adjacent ores, and a large mining and manu-

facturing town will be built within sight of Florence, that will give the best possible market for the larger portion of the products of the valley. Such a concentration of wonderful and permanent resources cannot fail to invite the attention of capitalists, and but one result is possible to conceive—plenty and prosperity. With a full realization of the value of our great resources, our people should organize for the purpose of inducing men of means, enterprise, and intelligence to establish themselves in our midst, and to foster every possible industry that promises success.—*Arizona Enterprise, Sept. 7, 1889.*