BUREAU OF ECONOMIC GEOLOGY
READING ROOM

The ROMANCE of SAN ANTONIO'S WATER SUPPLY and DISTRIBUTION

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Foreword

"Till taught by pain
"Men really know not what good water's worth."
—LORD BYRON.

It was men taught by pain to know the worth of good water who founded San Antonio.

Bitter experience with the parched plains of a semi-arid land gave them a keen appreciation of the bounty of Nature in providing the springs at the head of the San Antonio river and in San Pedro park.

The first mission settlements were built on the banks of the running streams issuing from these springs and in the intervening two hundred years this water supply has never failed. It has been a commanding force in the growth of those missionary outposts into the largest and most beautiful city in the nation's largest state.

To acquaint our stockholders, our consumers and all others interested with the story of the development of that primitive water supply and its efficient distribution to the consumers of today, this book is written. An effort has been made to present this historical data without loss of the intense human interest as well as to observe accuracy so that it may be used as a reference by students and others.

THE WATER SUPPLY COMPANY.

COMPANY HISTORY

IN these days of convenience in the matter of obtaining water for every use it is difficult to realize that less than a century ago San Antonio's only system of water distribution was by "aguadores," Mexicans who dipped water in buckets from the river and from San Pedro Creek and carried these buckets pendant from yokes about their shoulders to the houses in which their customers lived.

The two clear running streams which issued from bubbling springs supplied the early settlements with water in this manner until growth and irrigation needs made necessary a more efficient system of distribution less dependant upon labor. The result was the building of a number of "acequias" or ditches which carried water by gravity from the backwaters of dams erected in the streams. These "acequias" supplied water for household use as well as irrigation in all parts of the settlements and returned the unused water to the river before it passed the Missions on the South Loop in compliance with grants which gave the Missions water rights upon the river.

In a general way the "acequias" and their branches supplied all of that part of the present city included in the business section and the older, close-in residence districts. They solved the problems of the time but as early as 1840 an incident occurred which foretold the passing of the ditches and pointed the need for a system of distribution which would prevent contamination of the supply.

The incident mentioned is best told in the language of Mrs. M. A. Maverick, a pioneer San Antonian, as written in her Memoirs for private circulation. Mrs. Maverick wrote:

Experimenting Doctor

"An eccentric character of those days was a Doctor Weidemann * * * * a Russian scholar and naturalist and an excellent physician and surgeon. He was a highly cultivated man and spoke many languages. He lived on the old Chavez place on Acequia street (now Main avenue). I remember that on the night of the Indian fight of March 19, 1840, I visited Mrs. Higginbotham. While I was there Dr. Weidemann came up to her grated front window and placed a severed Indian head upon the sill. The good doctor bowed courteously, and saying: 'With your permission, madam' disappeared. Presently he returned with another bloody head, when he explained to us that he examined all the dead Indians and had selected these heads, male

and female, for the skulls as well as two entire bodies, to preserve as skeletons.

"He said, 'I have been longing exceedingly to secure such specimens, and now ladies, I must get a cart to take them home.' Dr. Weidemann had taken an active part in the fight and done good service mounted on his fine horse, and now he was all begrimed, bloody and dirty—the result of his labors as warrior, surgeon and scientist. He soon returned with the cart loaded with his magnificent specimens, took the two heads from the window and departed * * * *.

"That night Doctor Weidmann stewed the bodies in a soap boiler and when the flesh was completely dessicated, emptied the cauldron into the acequia. Now this ditch supplied the drinking water generally for the town it being understood that the river and San Pedro creek were reserved for bathing and washing. There was a city ordinance to this effect coupled with a heavy fine.

"On the twenty-first it dawned upon the dwellers upon the banks of the ditch that the doctor had defiled the drinking water and that probably they had taken in particles of Indian in their fluid. The people, very properly, gathered in indignation and a mob rushed to the mayor's office. The men talked in loud and excited tones and the women shrieked and cried * * * *. Many thought they were poisoned and would die. Doctor Weidemann was arrested and brought to trial. The people overwhelmed him with abuse and called him 'diablo,' 'demonio,' 'sin verguenza' and so forth. He took it all calmly, assured them the Indians had all sailed by in the night, paid his fine and went away laughing."

It is highly probable that the escapade of Doctor Weidemann started agitation in San Antonio for a method of water distribution which would do away with the possibility of contamination but it was not until a public calamity occurred—the cholera epidemic of 1866—that ways and means were actually sought for delivering water into the homes in a sanitary manner.

Contract Given in 1887

Many schemes were advanced, discussed and discarded. Agitation waxed and waned, the more progressive citizens reviving it each time with new vigor until in 1873 a definite attempt was made to organize a company and build a water works system. George M. Maverick was at the head of this movement but it failed of accomplishment as did another in 1875 of which H. B. Adams was the head.

In April, 1877, the city gave a contract to J. B. LaCoste and associates for supplying the city with water from the head of the river. The

contract stipulated that work was to be finished within fifteen months from and after April 3, 1877, a provision that Mr. LaCoste and his company carried out to the letter.

A reservoir was constructed on the hill at the eastern end of Mahncke park which is still in existence and capable of use. Near the head of the river a raceway was built across one of the large bends in the stream to a pumping plant which was located (parts of the stone end of the raceway may still be seen) at what is now the Lambert bathing beach in Brackenridge Park. The "drop" from the river level at the upper end of the raceway to the pumping plant location was some eight or ten feet and the water falling from the end of the raceway had sufficient force to operate a large turbine which was directly connected by gears to the plunger of a large pump. This pump forced the water to the reservoir from which it was distributed by gravity through the company's mains.

The waterworks was accepted by the city July 5, 1878, and the La Coste company prepared to reap the just returns from its enterprise and public-spirited service. To the dismay of the officers and stockholders it was found a most difficult task to overcome the prejudice of the day against new methods and to educate a people reluctant about changing old habits. Where hundreds of consumers were expected tens were the realization and although there is no record to show this definitely it is probable that the struggle was too great for the faith of Mr. LaCoste and his associates or the financial burden became too heavy and they disposed of their interests to a company headed by George W. Brackenridge in 1883.

Shared Prevailing Opinion

It is worthy of note that Mr. Brackenridge was one of those who at first doubted the practicability of the waterworks system and its desirability as an investment and yet to him, in after years and almost unaided, is due the credit for its success. In the book "San Antonio de Bexar," a historical sketch written and published by William Corner in 1890, appears the following statement of Mr. Brackenridge:

"The Water Works were constructed in 1877, at a time when the city was unwilling or unable to do anything and the citizens would have nothing to do with the scheme, giving it neither countenance or credit, believing that it would be a great advantage to the city and of little benefit to the stockholders.

"These were, I believe, the views held by very nearly all the citizens including myself.

"At present the company is completing what the stockholders hope will be the last large addition in the plant necessary to be made during the continuance of the contract with the city. I can truly say that, so far, they have received less interest on the investment than any citizen in San Antonio would be willing to accept, even upon the most undoubted and infallible investment. There has been paid them less than two per cent per annum upon the amount invested to the present time.

"For the first seven years the officers contented themselves to work without salaries. I traveled over the country at my own expense to make contracts for pipe and material."

When Mr. Brackenridge had caught the vision, however, his conversion was complete and his faith in the project became unbounded. He had taken an engineering course at Harvard University and in addition to the trips he made for the company at his own expense he gave his engineering services to the company without charge over a period of years when the work was most difficult and bore the greatest influence on the future of the company. The skill which he brought to bear is best attested by the remark made by one of the present engineers of the company who said that if the mains and pumping stations were to be replaced now to serve the city of San Antonio "not a line of mains or location of a plant could be changed to give better service."

Changes Front Completely

Further evidence of Mr. Brackenridge's change of views about the company is given by the fact that he, as a banker, advanced money to the LaCoste company and took some stock in it even before his purchase. Then in another paragraph in Corner's "San Antonio de Bexar" it is related:

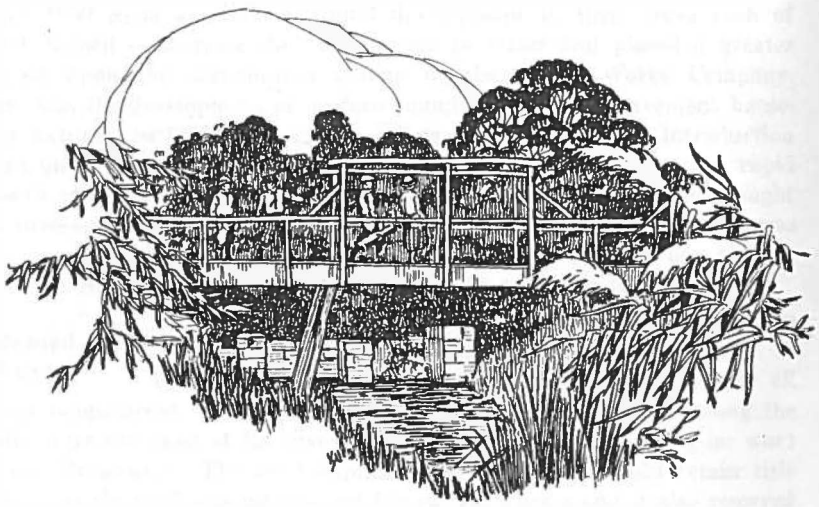
"The works took a new lease of life under Mr. Brackenridge. With a serene faith in the future of the city he has yearly put and advised his company to put thousands upon thousands of dollars underground until today (1890) the city has a vast network of iron pipes."

Mr. Brackenridge's presidency of the Water Works Company was continuous to the time of its sale in 1906 with the exception of one very short period and he brought to the position an equipment of knowledge and skill seldom found in one man. Besides his engineering course at Harvard Mr. Brackenridge took a law degree and then entering commercial life in San Antonio devoted his time to the banking business building up the San Antonio National Bank and the San Antonio Loan & Trust Company to be two of the strongest financial institutions in the Southwest. With his engineering and legal knowledge and his financial standing he was peculiarly fitted to bring the struggling Water Works Company through the years of its greatest stress and to build it into the valuable property it is today.

When Mr. LaCoste and his associates sold the plant San Antonio was only emerging from the village class and the market for water was limited to the few progressive citizens who recognized the desirability of sanitary handling of the city's water supply and who were able to pay for connections. The consumption was limited in another manner, in that household fixtures as known and in common use today were yet to be put upon the market. As a rule the only connection made by the individual consumer was a tap in the yard from which the water was drawn for all household uses. The same was true of business houses.

Old Plant Ruins Remain

Truly the conditions and the outlook were not such as to inspire great confidence in the success of the company but Mr. Brackenridge, with the foresightedness for which he was noted among those who knew him best, looked far into the future and felt himself justified in going ahead as if assured of maximum consumption of water from a much larger city. He foresaw the possibility of the original plant at Lambert Bach becoming inadequate to fill the city's needs in the near future and also the possibility that lowering of the water head in the artesian basin might curtail the supply from this plant. To meet those possibilities he purchased property along the river south of the old plant and constructed a new raceway with its lower end just west of the present park plant of the Water Supply Company. The stone walls of the plant he built there may still be seen near the putting green of hole No. 13 on the municipal golf links in Brackenridge Park. This plant also was equipped with a turbine and direct connection pump.



Even before events had justified his judgment Mr. Brackenridge had used his private means to obtain control of large acreage along the banks of the river south of his home which at that time was located on the ground now occupied by the College of the Incarnate Word. The value of this property and the water rights that went with it became apparent with the further development of the Water Works Company and in 1883 it was taken over by the company. In the next five years growth of the city and consequent extension of the company's mains forced the installation of a steam turbine pump at the "lower" plant, the water turbine pump being continued however as an auxiliary.

From his observations of the fluctuating "head" of the artesian basin and his study of the source of this artesian supply Mr. Brackenridge became convinced in 1888 that there was danger of the complete failure of the river as a source of supply following any long period of drought and he drilled a well near the reservoir as a reserve. This well did not flow and its capacity was small. It also was too deep to pump successfully and was abandoned.

Still intent upon getting a new source of supply Mr. Brackenridge purchased property on Market street in the belief that he could strike the artesian basin at a lower level. An eight-inch well was sunk there in 1891 and at a depth of 890 feet the artesian water was struck with so much pressure that it flowed out of a pipe fifteen or twenty feet high and blew out pieces of rock "as large as a man's head" according to wit-

nesses of its completion. This well flowed 3,000,000 gallons per day and was proof positive of the soundness of Mr. Brackenridge's reasoning. It was quickly followed by other wells twelve inches in diameter and in 1895 steam pumps were installed for direct distribution of the water through mains radiating from the plant and serving the district south of Houston street where the pressure had been inadequate from the reservoir supply.

The Market Street plant continues in use today the only changes being more modern pumping machinery.

Sees Danger To City Health

In addition to the economic reasons for seeking an artesian supply of water for the City the importance of such supply to the health of the City was also considered by Mr. Brackenridge. Shortly before the acquisition of the property on Market Street and the drilling of the well thereon, the cholera had broken out in Russia and was ravaging parts of that country. Doctor Ferd. Herff, now deceased, was a lifetime friend of Mr. Brackenridge's and was interested with him in a number of enterprises, including the water works. Doctor Herff was not only a remarkable physician and surgeon but was also a scientist and possessed of a wonderful fund of information on epidemics, their causes and prevention. He fully realized the danger to the health of the community in water taken from the river or the springs and pumped into open reservoirs for gravity distribution to consumers. He therefore urged upon Mr. Brackenridge the importance of securing an absolutely pure artesian water supply which when obtained and used to the exclusion of the surface water supply by the inhabitants of the City would give practically complete protection against certain germ diseases or at least against any epidemic from any of such diseases.

The company also continued development work near the head of the river several wells being bored at the "lower" station and several more steam pumps being added to the plant equipment. A 12-inch well also was drilled just east of what is now Lambert beach for the purpose of further utilizing the turbine pumps.

In the period from 1880 to 1900 the company had enjoyed a steady growth as San Antonio emerged from the village class and the inhabitants began more and more to accept innovations as a matter of course. In the last five years of this period San Antonio installed its first sewer system and with the installation of plumbing in houses, which hitherto had depended upon cesspools, came a greatly increased consumption of water.

In 1900 San Antonio's population was 53,321, an increase from 37,673 in 1890 which in turn was an increase over the 20,000 of 1880.

After 1900 came a period of rapid development in three ways each of which helped to increase the consumption of water and placed a greater burden upon the distributing system of the Water Works Company. First was the development of modern plumbing with its convenient household fixtures, bathtubs and indoor toilets. Second was the introduction of shrub and tree planting and better care of lawns. Third was a rapid growth of the city itself with the opening of new additions which brought the necessity of more mains and more service connections. So rapid was this growth that in 1910 San Antonio had almost doubled her population, the census for that year showing 96,641 residents in the city.

Park Deeded To City

In the meantime two important events had taken place in the life of the Water Works Company and the City. In 1899 the company deeded to the city of San Antonio all of the magnificent wooded tract of land which it had acquired along the banks near the head of the river reserving only a strip fronting on what is now Broadway. The deed stipulated that the city should retain title as long as the land was maintained for park purposes and it also reserved all water rights in the park including the erection of such dams, lakes, etc., "as may be useful to it for supplying water to the city and its inhabitants or for irrigation purposes." A similar deed was given to the land embraced in Mahncke Park.

The importance to the company of this transfer lies with its retention of the water rights which subsequent events have proved to be of almost inestimable value in that it affords one of the few accesses at low level in that section to the artesion water pool under the city. Its importance to the city is shown in the present beauty of Brackenridge Park which has won national fame.

The second important event was the sale of the company in the latter part of 1905 to George J. Kobusch of St. Louis, marking the passing of the water works for the first time from San Antonio control.

As in all of the history of the water company from its inception there is human interest in the manner by which this sale came about. Mr. Brackenridge at various times in the spring of 1905 had made to one of his employes an offer to sell the property urging the employe to get the money together and buy it. Knowing that Mr. Brackenridge knew his very limited financial resources this employe was at first inclined to treat the matter as a joke but after the offer had been renewed several times he spoke of it to a friend who was planning a trip to Chicago and who was in the confidence of moneyed men in the Windy City. A thirty days verbal option was arranged and the friend journeyed to Chicago only to be disappointed by his inability to interest the men he had gone to see.

Fate Takes A Hand

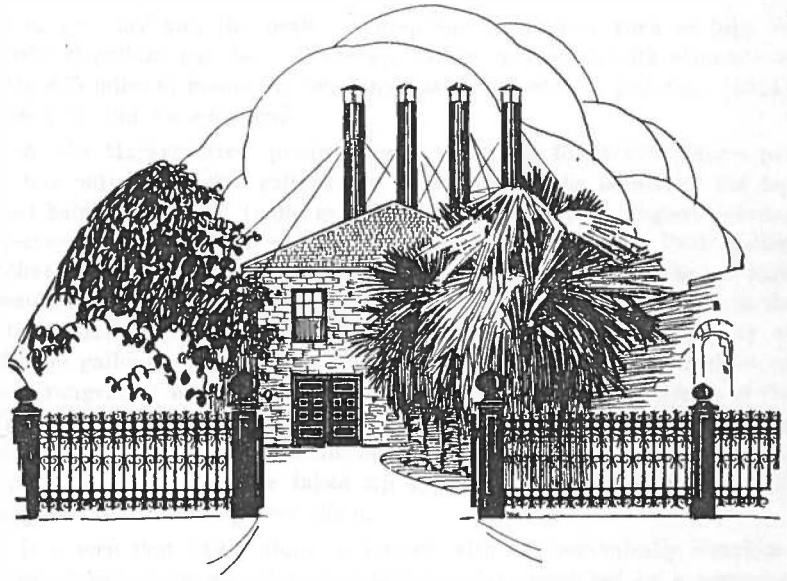
It was folowing this disappointment that Fate played one of those little tricks which so often affect the destinies of men and affairs. On his return trip to San Antonio the prospective promoter stopped off in St. Louis and by chance met a cousin he had not seen for some years. The meeting resulted in an invitation to dinner and his introduction there to the husband of the cousin who chanced to be the private secretary of George J. Kobusch, a power in St. Louis financial circles of that day. The tale of the unsuccessful trip to Chicago was told at the dinner table and the cousin's husband became interested. Arrangements were made for the San Antonio promoter to stay over a day and the financier was told by his secretary of the opportunity to buy the San Antonio Water Works company. Quick action followed and before nightfall the San Antonian had found his buyer and had $100,000 in cash with which to bind the option.

It is related with a chuckle by the former employe of Mr. Brackenridge that when the latter was faced with the actual prospect of transferring the property which he had built from its infancy and which he had regarded with almost a father's love, he was reluctant to go through with the deal. He had given his word, however, and that was sacred with him.

"He made them bring that $100,000 to San Antonio though and deposit it in the San Antonio National Bank before he would go ahead and execute the option," said the former employe with an appreciative grin.

The deal was carried through and in the following year, 1906, the San Antonio Water Supply company was organized with Mr. Kobusch as the majority stockholder. A short time later negotiations were opened by the Mississippi Valley Trust Company of St. Louis, handling Mr. Kobusch's affairs, with a Belgian syndicate in Antwerp and in 1909 a deal was closed by which the Belgian capitalists acquired 90 per cent of the stock and began operations under the name Compagnie des Eaux de San Antonio, with the Mississippi Valley Trust company acting as agent for the syndicate.

Coincident with the purchase by the Belgian syndicate another period of rapid growth opened in San Antonio which resulted in the city's almost doubling its population again within ten years. In 1910 the population was 96,641 and in 1920 the government census showed more than 161,000 residents. This period saw the opening of many suburban additions to the city with a consequent extension of the water distributing system and development of the supply. The engineer sent to San



Antonio in 1913 by the Mississippi Valley Trust company found only one plant in operation, the one on Market Street, and confronted by the necessity of rapid action toward getting a further supply he considered first a plan to drill wells on the Salado Creek east of Fort Sam Houston. A study of the economics of that possible supply convinced him that the upper reaches of the San Antonio river in Brackenridge Park offered a better opportunity and in 1914 work was started on the plant in the the park using four wells which had been drilled previously and three new ones, the total capacity being 20,000,000 gallons of water daily. The plant was put in operation in June, 1915 and connected with the mains in the high pressure district of the city.

World War Has An Effect

Germany's invasion of Belgium in 1914 injected a new element into the progress of the Water company for as a result of the cutting off of the Belgian owners from communication with their agents in this country the money which would have gone to them in interest and dividends had to be placed in the company surplus and became available for development work.

With two big plants in operation, one in the northern end of the city and another in almost the business center, the company saw the need for and strategic advantage of a third plant in the southern section and in 1918 succeeded in drilling two unusually good ten-inch wells on the

Wickes tract purchased years before by Mr. Brackenridge and on which he had failed in several attempts to get wells. This failure probably was due to the driller's error in going through the pervious rock structure in which the artesian water lies.

The third plant was placed in operation in 1922 with an electrically driven centrifugal pump of 6,000,000 gallons capacity on the wells which are of 8,000,000 gallons capacity per day. It is used largely as an auxiliary to the other plants during the peak load periods in the summer.

This, however, is getting a little ahead of the story for in 1918 came a combination of circumstances which later brought about transfer of the company and once again placed it entirely in the control of San Antonio capital. After the signing of the armistice which ended the war the Belgian owners of the company found themselves in urgent need of money for rebuilding projects in their native land. The Belgian franc had fallen to a low rate of exchange and it was possible for American investors to purchase the franc at this low price and realize a profit in the transfer while at the same time the Belgians would receive a proportionately larger number of francs for their stock.

This set of circumstances resulted in the formation of a syndicate of San Antonians which in January 1920 purchased two thirds of the stock of the Belgian syndicate. The members of this syndicate were E. B. Chandler, J. H. Lapham, W. C. Rigsby, Robert J. Harding, A. S. Gage, W. K. Ewing, J. H. Kokernot, H. L. Kokernot, John Molesworth, Charles Schreiner, Jr., Gus Giesecke and J. N. Bennett, Jr.

The remaining one-third of the stock of the Belgians was taken over by the Mississippi Valley Trust company and later was absorbed by San Antonio investors.

Purest Water, Lowest Rates

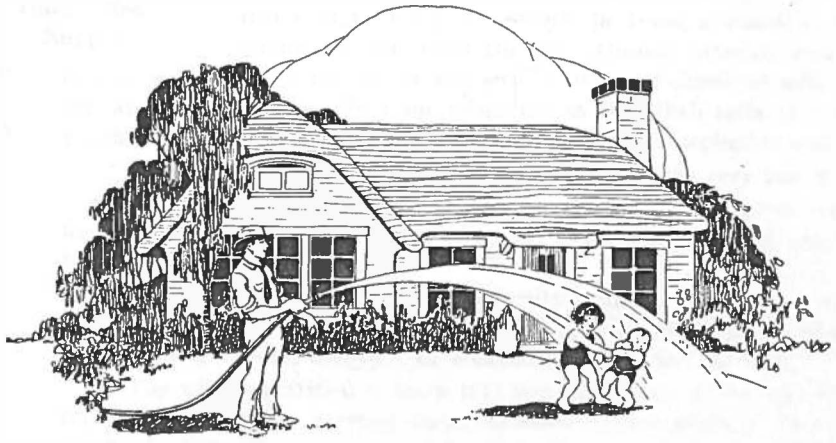
Thus has been traced the romantic history of the water supply company in San Antonio from the humble beginning in 1877 to the princely property of today which furnishes this largest city in Texas with an abundance of the purest water in the world at the lowest rates. Always and sometimes under great difficulty the company has kept pace with the growth of the city which has been remarkable in its rapidity. Today the company is equipped to take care of the needs of an even larger city and it is a fact in which the company takes great pride that consumers never have just cause to complain of the service.

With its three plants in a straight line from north to south in the city at the points where the artesian supply is easiest available and from which distribution is most economical, the San Antonio Water Supply Company has a total well capacity of almost 75,000,000 gallons of water per day. The daily consumption of water in San Antonio averages 23,000,000

gallons per day and the peak consumption in summer runs as high as 55,000,000 gallons per day. There are 34,500 consumers with connections on the 425 miles of mains the company has constructed at this time (1924) in the city and its additions.

At the Market Street plant the well supply is 43,000,000 gallons per day but only 20,000,000 gallons are pumped into the mains by the big Allis-Chalmers vertical, triple expansion, steam pumping engines leaving a reserve of 23,000,000 gallons per day. At the Brackenridge Park station another 20,000,000 gallons per day is available for pumping into the high pressure mains by the steam turbine equipment there and at the plant in the southern part of the city the electrically driven pump has a capacity of 6,000,000 gallons on a well capacity of 8,000,000 gallons. A feature of this arrangement of the stations aside from distribution economies is the balancing of the load by the big pumps at the Market Street station. The pumps at the other two stations may be run at a uniform rate and inequalities in the load be taken up by the powerful triple expansion engines in the Market Street plant.

It is seen that San Antonio is blessed with an economically distributed and abundant supply of pure artesian water furnished by a company with a history as romantic as that of the city itself. The source of that supply, treated in the following chapter, is a subject of parallel interest and shows the benign part that Nature has taken in providing the city with water that never sees the light of day from the time it falls as rain and is absorbed into the earth until it runs from the tap in home or business place.



Source and Supply

HUNDREDS of thousands of years ago Nature began the work of building the catch basin and the rock pipeline which ages later were to give San Antonio its abundant supply of the purest artesian water known to man.

Away back in the Pelcozoic age the foundations of what is now Texas were laid. On top of this were laid the layers of rock and earth of the Cretaceous period and above these, again, were laid the Eocene formations. In the formations of the Cretaceous period occurs the Edwards limestone which became the catch basin and pipeline of the artesian water supply of today. It is a pervious rock formation lying between two impervious layers and is peculiarly adapted for imbibing and transmitting water.

Texas is the southernmost of the system of the great plains of North America and is in turn divided into three plains beginning in the north just below the Colorado River with the "Llano Estacado" or Staked Plain which extends southward to the Edwards Plateau and the latter extending to the Rio Grande plain which begins just north of San Antonio. It is necessary to keep these facts in mind in considering the source of the supply of artesian water.

Each of the plains in Texas "steps down" in the form of a giant terrace to the plain south of it and then to the sea. Two schools of geologists have different explanations for this, one upholding the idea that the land was raised up from the sea by some giant force and the other that the land dropped into the sea, the successive breaks forming the boundaries of the plains.

Earth Forms "Pipeline"

Whichever explanation is correct the facts remain that the formations of the earth are so laid and subsequently broken that rain falling on the "Llano Estacado" or Staked Plain and on the Edwards plateau are absorbed in the earth, there being no rivers for drainage, and find their way to the Edwards limestone formation which rises to near the surface on both plains. Water seeks its own level and due to the Balcones fault or "break" in the formation which is found just north of San Antonio the Edwards limestone is brought so close to the surface that water entering it higher up on the Staked Plains and on the Edwards Plateau bubbles forth from the earth in springs which form the San Antonio River and San Pedro Creek. Pour-

ing it into the "pipeline" at the greater elevation forces it out of the lower end in San Antonio.

From this it is seen that contrary to general opinion, San Antonio's artesian water supply is not from a local source but is dependent upon the rainfall in an area the northernmost end of which is 600 miles away. Local rainfall, that falling within a short distance of San Antonio, has very little permanent effect upon the "head" of the artesian supply although this "head" has been known to rise several feet following heavy and continued rains in the city and its immediate territory. It is during long periods of drought on the plains to the north that the "head" of the artesian water has at times become so low that the springs at the head of the river have almost ceased to flow and the river has become a nearly "dry" stream.

This same process of nature which brings water for so many hundred miles to the consumer in San Antonio gives another advantage in that the water filtered through rock and sand into great underground cavities and forming pools far removed from contamination is practically free from mineral impurities and absolutely free from bacteria. Needless to say this advantage is reflected in the health of the citizens of San Antonio, a city where epidemics of disease traceable to contaminated water supply are unknown.

Prof. J. R. Bailey of the school of chemistry in the University of Texas made an analysis of the San Antonio water in 1911 and said in his report:

Unexcelled Supply

"This water is exceptionally low in mineral matter, in fact I doubt if any other water in Texas, available in large quantities, can excel the San Antonio artesian water in this particular. Both the nature and small amount of dissolved salts show the water would be excellent for irrigation as the alkali salts of sodium which have an injurious effect on soil, are present in negligible amounts.

"As a potable water the San Antonio water is of the very best type."

The temperature of the artesian water remains at 75 degrees regardless of the season. The water has no color and no sediment of any kind has ever been found in it.

Prof. H. W. Harper of Texas University made an examination of the water for the company in 1903 and his findings were practically the same as those of Professor Bailey. In concluding his report he said:

"You will be gratified to learn that you possess one of the best waters thus far found in an artesian basin—a water of low mineral count and absolutely free of any organic contamination. You and the citizens of

San Antonio are to be highly congratulated upon the privilege of using so pure a water as that which emanates from your wells."

A third particular in which San Antonio is favored by nature in providing a water supply is in her geographical situation at the point where the artesian water is best available. The Edwards limestone formation dips so rapidly south of San Antonio that only a few miles away the cost of drilling to it is almost prohibitive.

With all of these advantages man had but a comparatively small part to do in making the water supply available to consumers in the city. Be it said to his credit, however, that through the agency of the San Antonio Water Supply company with its model pumping plants and miles of mains and that of the inventors of plumbing conveniences nature's efficiency in supplying has been duplicated in the distribution of the water. The evidence of this is so apparent in every home that there is no need to recount it.

Abundant But Limited

In a preceding paragraph reference was made to the fall of the artesian water "head" or pressure in times of drought and it is this condition which calls attention to a warning which frequently has been given by geologists and engineers. This warning has to do with the necessity of conserving the artesian water supply for the use of the city and preventing its extensive use for purposes not essential to the well-being or actual development of the city.

These engineers and geologists say that the popular idea that San Antonio's water supply is unlimited is a fallacy. It is abundant, they assert, but not unlimited.

In a paper prepared for the Scientific Society in 1911 Arthur H. Muir made the following statement:

"About 15 years ago, when there were many less wells than at present, observations were made of the flow of the springs while a number of the wells were simultaneously turned on and off. It was found that the flow of the springs decreased when the wells were allowed to flow and increased again when the wells were shut off. Furthermore, corresponding with the enormous increase in the number of wells and volume of water discharged by them in the last fifteen years, the flow of the San Antonio springs has steadily decreased, so that the river now flows a mere trickle. The injury to these springs is due partly to the fact that the artesian wells have been bored on lower ground than the location of the springs, but also quite largely to the much lower frictional resistance offered to the flow of water by the enormous large, smooth and straight passages of the wells than by the comparatively nar-

row, rough and tortuous fissure and fault cracks through which the springs discharge."

At another point in the same paper he said:

A Warning Is Sounded

"It is well to remember that no artesian basin has an unlimited supply. However enormous is the volume of its stored up water and incoming flow, it is definite in quantity. When the number of wells increases so that their flow exceeds the average incoming supply, their pressure and flow decrease. This has been the universal history of artesian districts.

"As already pointed out, the San Antonio area is peculiarly favored with an extraordinary supply, but a continuous increase in the number of wells draining it, until they get beyond the limit just referred to, will eventually reduce the flow of all the wells, stop the flow of those on higher ground, and, if pumping on a large scale is then resorted to the artesian head may become so lowered that all the wells of the district will have to be pumped."

Other engineers have given the same warning and Alexander Potter, consulting engineer of New York who was retained by the city to make a survey of the water-works system with a view to recommending rates, said in his report to the city commission dated May 17, 1924:

"My complete report dwells at length on the importance of conserving the water supply. I have negotiated with the Water Company on the basis that the supply was abundant and easily accessible and that, therefore, the consumers should profit most by this favorable situation. Unless water is conserved, rates must sooner or later be very substantially increased.

"San Antonio with 35,000 consumers used during 1923, an average of 22,491,000 gallons of water per day. Dallas, with 44,000 consumers, used an average of 12,000,000 gallons per day, but even with this low consumption, they have been forced to begin operation on an auxiliary supply for which they have recently voted $5,000,000 worth of bonds.

Best Water and Lowest Price

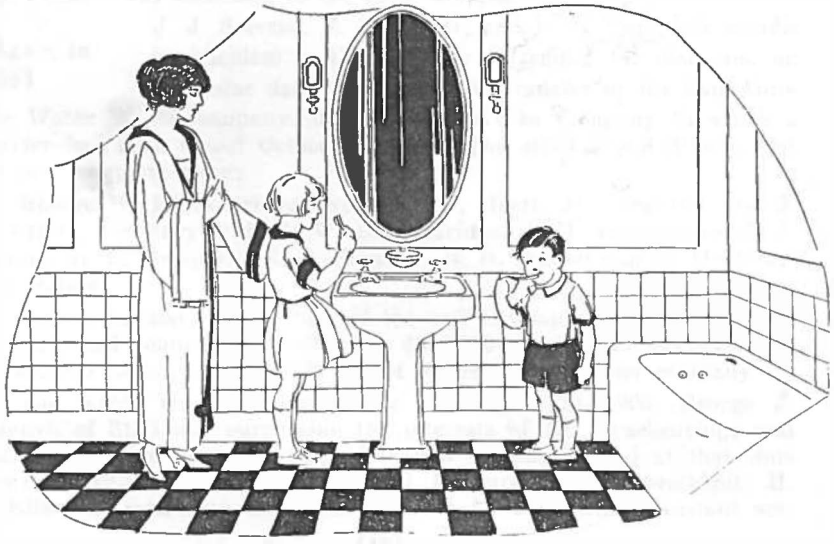
"The consumer must always bear in mind that they must ultimately pay the bill for such auxiliary supplies as may be required. The construction of the large reservoir and the proposed large mains leading therefrom will be a step towards a conservation of the underground waters of San Antonio. Without such conservation of its water supply, San Antonio cannot always enjoy the unique position which it now holds and deserves in the water works field, namely, the best water in the State at the lowest price.

"Concerted action on the part of the citizens to conserve the water supply by cutting out waste will contribute to retard the time for this large expenditure which perhaps might mean another increase in rates.

San Antonio's water rates are very low, even with the increase recommended, in comparison with those paid by other cities. It is up to the people of San Antonio to keep the rates low and to conserve the water."

Should this remote possibility of failure in the water supply ever come to pass, however, the consumers with connections on the mains of the San Antonio Water Supply Company would be the last to suffer. With the foresight which always has been shown by its engineers the three pumping plants of the company are the closest to the underground supply of any in the city. Long after flowing wells have ceased to flow and long after other wells can no longer be pumped the three big plants of the company will be able to supply water to the consumers. The plant in Brackenridge Park has its pumps at a level fifty feet below the ground surface in a great cylindrical room built after caissons had been sunk to the required depth to insure a water supply on land of that elevation. The Market Street plant pump access is twenty-eight feet below the surface and the plant in the southern part of the city is built at the naturally lowest level at which the artesian supply is reached in the city.

Nature has literally gone into partnership with man in giving San Antonio a pure water supply in abundant quantity. It is one of the contributing causes to the growth of the greatest city in Texas and the San Antonio Water Supply Company is justly proud of the part it has had in that consummation. It hopes to be able to do its share in the future.



FINANCIAL GROWTH

EVER since its inception in 1877 the company distributing San Antonio's water supply has had an unbroken record of soundly conservative financing. Beginning with an organization capitalized at $100,000.00 it has grown to a $6,000,000 corporation whose stock sells above par whenever any is offered on the market.

With the exception of the first few years after its organization the company always has paid dividends and earned a surplus for extension work, plant equipment and general expansion. On only one occasion, and that a forced sale, has its stock ever sold below par. Never in its history has sales promotion been necessary in disposing of any of its stock on the market.

The following table best shows the financial growth of the company in the almost 50 years it has been serving the water consumers of San Antonio:

Year	Stock	Bonds	Total
1877	$ 100,000		$ 100,000
1879	150,000	$ 100,000	250,000
1882	180,000	180,000	360,000
1883	500,000	500,000	1,000,000
1884	500,000	680,000	1,180,000
1906	875,000	999,000	1,874,000
1908	1,500,000	2,000,000	3,500,000
1910	1,500,000	2,047,000	3,547,000
1913	1,500,000	2,312,000	3,812,000
1915	1,598,700	2,500,000	4,098,700
1916	1,599,100	2,500,000	4,099,100
1920	2,206,700	2,500,000	4,706,700
1921	2,500,000	2,500,000	5,000,000
1923	2,500,000	2,500,000	5,000,000
1924	3,500,000	2,500,000	6,000,000

Outstanding Paper $6,175,000

In addition to the stocks and bonds recorded in the above table as outstanding in 1924 there are $150,000 of par value five-year notes due in 1929 and $25,000 worth of Casino bonds, an indebtedness acquired when the Casino property on Market street was purchased.

On Nov. 24, 1877, J. B. LaCoste and his associates, S. A. Oliver and W. R. Freeman subscribed to stock in the San Antonio Water Works company to the amount of $100,000 and they accepted a bid of the King Iron

Bridge & Manufacturing company to construct a water works system for $94,000.

The system built by the King company was the one described in a previous chapter and consisted of the turbine driven pump near the head of the river which forced water to the old reservoir for distribution by gravity. As was shown in that chapter the first company met with many discouragements and in 1879 additional capital was necessary. In the reorganization that ocurred then the capital stock was increased to $150,000 and the stockholders listed were J. B. LaCoste, George W. Brackenridge, William C. Freeman, James P. Newcomb, W. R. Freeman and F. Herff, Jr.

On October 13, 1879, the company issued 12 per cent preferred stock to the amount of $50,000.00 and on Nov. 7 of that year the following new names appeared in the stockholders' list: J. H. Kampmann, G. H. Noonan, Jacob Waelder and J. A. Fraser. Three days later an annual meeting with election of officers was held and the following men were chosen: G. W. Brackenridge, president; J. B. LaCoste, vice president; F. Herff, Jr., treasurer; J. A. Fraser, secretary; J. B. LaCoste, G. W. Brackenridge, J. H. Kampmann, Dr. F. Herff, G. H. Noonan, J. P. Newcomb and Jacob Waelder, directors.

Maj. G. B. Russell's name was added to the directorate January 19, 1881 and in December, 1882, General N. B. Sweitzer's name appeared as a stockholder and director. On that same date the capital stock was increased to $180,000.00 and on July 2 of the following year the bonded indebtedness was increased to the same amount.

Sold Again In 1883

J. J. Stevens, F. Herff, Sr. and L. E. Campbell became stockholders in the company November 16, 1883, and on this same date is recorded the transfer of the San Antonio Water Works company to the Water Works Company to which a charter had been issued October 6, 1883. The officers and directors of the new company were:

George W. Brackenridge, president; F. Herff, Jr., treasurer and J. A. Fraser, secretary with G. W. Brackenridge, J. H. Kampmann, J. J. Stevens, L. E. Campbell, N. B. Sweitzer, G. B. Russell and F. Herff Jr. as directors.

The authorized capital stock of the new company was $500,000 with an authorized bonded indebtedness of $500,000 which later was increased to $680,000 to provide for $180,000 of bonds of the former company.

The Water Works Company was sold again in 1905, George J. Kobusch of St. Louis purchasing the interests of Mr. Brackenridge and other San Antonio stockholders. The new officers elected at that time were: George J. Kobusch, president; C. H. Surkamp, vice president; H. E. Ellsworth, secretary and treasurer and M. F. Collins, assistant secretary. The new directors were: George J. Kobusch, C. H. Surkamp; J. M. Nix, John J. Stevens, W. S. McCall and Henry Semple Ames. Later, Henry Semple Ames, vice president of the Mississippi Valley Trust company of St. Louis, became president and upon his death Brackenridge Jones, president of the Mississippi Valley Trust Company, succeeded to the office.

When the San Antonio Water Supply Company purchased the Water Works Company in 1906, the authorized capital stock was $2,500,000 with $1,500,000 issued and the authorized bonded indebtedness was $2,500,000 of which $1,000,000 were issued. The unissued bonds were set aside to be used to carry on certain improvements and to pay for $999,000 outstanding bonds of the old company when they should become due.

In 1914 Robert J. Harding became vice president of the company and has remained in that position to the present time assisting in the oranization of the San Antonio company which took over the holdings of the Belgian syndicate and which at present controls the company. In this organization in 1920 the officers were E. B. Chandler, president and treasurer; Robert J. Harding, vice president and H. E. Ellsworth, secretary. Upon the death of Mr. Chandler, A. S. Gage was elected president, Mr. Harding retaining his position as vice president, J. P. Newcomb being made secretary and Frank J. Way, assistant secretary. The directors are A. S. Gage, H. L. Kokernot, J. W. Kokernot, J. H. Lapham, Charles Schreiner, Jr., Robert J. Harding and H. E. Ellsworth.

Of the 260 stockholders in the company at the present time 211 are San Antonians owning the controlling interest.

FRANCHISES AND CONTRACTS

THE first contract made between the original water company of which J. B. LaCoste was the head, and the City of San Antonio was for a period of twenty-five years from the completion of the proposed plant at the end of which time the city was to be given the opportunity to buy the plant at an appraised value. If the city did not buy at the end of the twenty-five years, the contract was to run until the city did buy and the right to purchase inured to the city every five years thereafter, the city being required to give twelve months notice of intention to buy.

An amended contract or ordinance was drawn in 1881 when J. H. French was mayor of the city and George W. Brackenridge had acquired control of the company. The features of the amended contract were the relinquishment by the city of a rental of $500 per annum; that the company was to pay taxes on an assessment up to the amount of $250,000 and that at the expiration of the contract if the city should avail itself of the right to purchase, and the parties could not agree as to price, the matter should be decided by arbitration.

An attempt to purchase the water company was made in 1890 at an agreed price of two million dollars. Mayor Bryan Callaghan favored the purchase and made a strong fight for it but the taxpayers voted against the proposed bonds.

The company continued to operate under the old contract until 1894 when a new one was drawn, joined in by the San Antonio Water Works Company, cancelling the old contract, leaving out the illegal provision for exclusive privileges and specifically granting to the new company franchises for the laying and maintaining of pipes, etc., and the operation of the water system during the corporate term (50 years) of the charter life of the company and for ten years thereafter.

In 1902 this contract was renewed in all its essential features, including a confirmation of the grant of franchises. In 1914 it was again renewed and the term lengthened to the year 1956.

SUPPLEMENT

ALTHOUGH the water franchises were confirmed and extended to 1956, the contract made in 1914 to supply water to the City, and residents of San Antonio, was made for a term of ten years and accordingly it expired on January 1, 1924.

Shortly before the expiration of this contract the Water Supply Company made it known to the City that they would expect an increase in the water rates when a new contract was made. This brought about a controversy between the Water Company and the City which resulted in the Water Company forcing an increase of rates through Federal Court action by obtaining a temporary injunction against the City.

In the meanwhile negotiations were begun which finally resulted in the City acquiring the water works system. The purchase was consummated through the First National Company of St. Louis, Mo., on June 1, 1925, at a cost of Six Million Five Hundred Thousand ($6,500,000.00) Dollars, and in addition to this the City borrowed Five Hundred Thousand ($500,000.00) Dollars for improvements, making a total indebtedness of Seven Million ($7,000,000.00) Dollars, payable over a period of forty years, for which bonds were issued against the assets of the water system.

From June 1, 1925, the plant has been operated as a City department by a board of trustees, known as the Water-works Board of Trustees. This Board is composed of:

A. W. Seeligson, Chairman
S. B. Weller, Vice-Chairman
C. A. Goeth, Trustee
Otto Wahrmund, Trustee

This Board appointed W. D. Masterson to manage the system and J. P. Newcomb was retained as secretary.

The water system now has more than forty-five thousand connections supplying an approximate population of two hundred and thirty-five thousand, consuming a daily average of twenty-five million five hundred thousand gallons of water, supplied by twenty-five artesian wells, twelve of which are located in the Market Street station, nine at the Brackenridge Park station and four at the Mission station.

The purchase of the water plant by the City has proven to be a very successful accomplishment for which the late Mayor John W. Tobin deserves full credit. There are many interesting angles to the story of San Antonio's water supply, only a part of which are told in the foregoing. There is romance about San Antonio and it has crept even into its water supply.

December, Nineteen Hundred Twenty-Seven