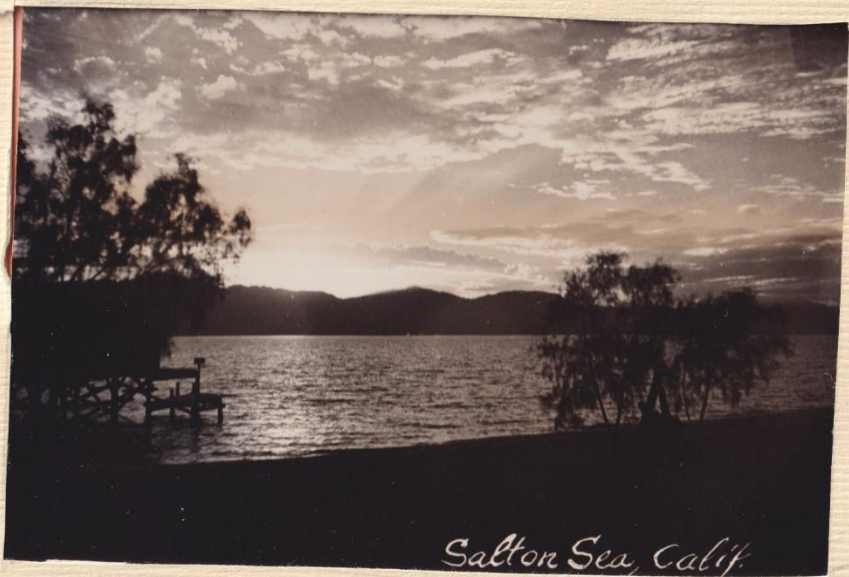
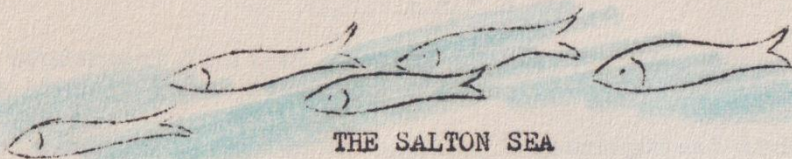




Salton Sea, Calif.



THE SALTON SEA

Imperial and Coachella
Valleys

By

Helen Burns
Salton Sea Beach
California

Photograph by E. Horstmann

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H I S T O R Y

After the wonderment at first viewing the Salton Sea, comes the question, "how?", and its history is an absorbing one.

The Colorado Desert is the upper half of a geographical trough extending from the San Geronio Pass, between the San Jacinto and San Bernardino Mountains, California, to the Cape of San Lucas, Mexico. It is believed that this was all mountainous in earliest times and that the Sea occupied the whole area, making islands of the loftiest peaks and bringing many forms of sea life, fossilized beds of which are now found as high as 1,000 feet above sea level. Geologists agree that the Salton-Gulf depression was caused by a series of the earth's movements*, begun much later, about the middle of the Tertiary Age (20 million years ago). During these disturbances the earth subsided leaving a jagged scar stretched from the Gulf northward. At this time the Gulf of California swept in and an immense Sea was formed. So, for the second time the Sea occupied this area.**

The peaceful, silent panorama of Sea and mountains today give the average person little indication of the blazing fury which formed them. Indeed, no combination of words or stretch of the imagination could picture the violent upheavals which must have taken place. Mountains suddenly thrusting angry heads into the sky, some crashing into hollows far below; fiery volcanoes spewing then drooling red-hot lava streams, they creeping snakelike through the chaos; an intruding torrent; sky and earth of fire and smoke and steam -- and then a calm, and not a thing alive to see or feel -- this may well have been the beginning of the Colorado Desert and the Desert Sea as we know them today, although of course the configuration of the region in those times was a great

deal different.

In these ancient times when mountains and Basin were formed and the waves of the Gulf were curling on the desert sands, a powerful river made her entrance and she still is playing the leading role in the story of the Colorado Desert. The Colorado River is rightly called the Mother of the Valley, as she built it and nourished it, and she is still supplying water and nourishment to make possible the tremendous and diversified crop yield throughout Imperial and Coachella Valleys. But this work was begun in ages past. The Colorado River carried her rich load of silt to the shallow, smooth channel of the Gulf where, on emptying into its waters, she deposited it. As she dropped this silt she began building a delta until, over a period of time, this delta extended from the Algodones Sand Hills, below the Yuma of today, to Cerro Prieto, Mexico, and it was high enough to completely divide the Gulf, cutting off this upper portion, leaving here a beautiful inland Sea.

Then the Colorado, sometime in her meanderings, found the Basin, possibly while it still held the imprisoned waters of the Gulf. Though her waters varied in amount and their presence was spasmodic, the Sea gradually rose. The Colorado shifted her channels many times, leaving the Basin for long periods, then returning and perhaps pouring her full volume into it. At other times when she was flowing into the Gulf, her flood waters would overflow and find their way into the Trough, so that the process was variable. It is believed that the Basin experienced desiccation and refilling many times and that the Lake fluctuated for hundreds of years. Eventually, though, the Sea was displaced by fresh water, as shown by the ancient shoreline, shells and travertine (calcium carbonate deposit), which were all formed by fresh water. This immense Lake was 100 miles long and about 35 miles wide.

Because of the Indian pottery and relics still found along the old shoreline, it is known that some of the more adventurous Indians discovered this beautiful land and brought their families here. The ancient Lake and the Valley in which it settled are both known as "Cahuilla," from the Cahuilla Indians, who inhabited the area. (Lake Cahuilla is sometimes referred to as Blake Sea, for Professor William Blake, who made the first thorough and scientific studies of the region.)

Then in her typical spirit of abandon the fickle Colorado turned from Lake Cahuilla and it eventually evaporated in the winds and under the blazing sun, leaving a Basin of salt beds, shells and dead fish surrounded by ringed water lines on the mountains.***

This gradual drying up of the Lake is part of the tradition of the Indians and they state that the water of the shores of the Lake retired "poco-a-poco" (little by little). One can imagine how, many many years after their ancestors had first come into this land, the Indians were forced to leave as the waters became salty and the fish died; how they moved to the mountains above San Diego or to the Colorado River valleys, relating their strange story.

Our River, though, was not yet through with the Salton Basin. Again she began to fluctuate between the Gulf and the Cahuilla Basin, which is now referred to as Salton Sink, or Salton Basin, because of the beds of salt left by the Lake. She came by way of the Alamo River until her new banks were formed, again sending her back into the Gulf. And always when she came she brought her minerals and animal matter, enriching the soil.**** It is recorded that her flood waters flowed into the Salton Sink in 1840, 1842, 1852, 1859, 1862 and 1867, and some of the waters found their way into the Basin nearly every year after that.

Men saw the great possibilities for Reclamation of the Colorado Desert as early as 1852. They were considered visionary and their plans fantastic, but there was always someone interested and working for this great project; and

finally, in 1896, the California Development Company was organized. Because of lack of funds, no work was done until 1900, and it was 1902 before water was first turned into the main canal for irrigation.

One of the difficulties at first was securing a concession from the Mexican Government, as the main canals were to run through Mexican soil for several miles. This was obtained, however, the terms requiring that a head gate for taking water from the Colorado River be maintained on the Mexican as well as on the California side. (Since the construction of the All-American Canal the canals have all been north of the border. Gates at Imperial Dam, above Yuma, divert Colorado River water through the All-American Canal, and a portion of this water is subsequently diverted into Mexico at Pilot Knob, about twenty miles downstream from the Dam.)

The first canals brought water from the Colorado River to Imperial Valley, delta lands lying below sea level between the Gulf of California and the Salton Basin. A railway was constructed and towns were built, the first towns being Brawley, Imperial, Holtville, Heber and Calexico.

By September, 1904, the California Development Company had constructed over 700 miles of canals and ditches, had brought 8,000 settlers into Imperial Valley and had nearly 75,000 acres in cultivation (In 1914 the Imperial Irrigation District was organized and in 1915 it took over the canal properties. In 1918 the Government appropriated \$15,000 and the Imperial Irrigation District contributed \$30,000 towards a complete survey and cost estimate for an All-American Canal. In 1940 waters from the All-American Canal were being used for irrigation in Imperial Valley, and there are now 435,000 acres being irrigated by these waters in that Valley.)

While the California Development Company was working on the construction of the canals for reclamation of the Imperial Valley, artesian wells were supplying

water for irrigation in Coachella Valley, to the north. It was in 1900, six years after the first strong flow of artesian water was obtained, that the hydraulic method of drilling was introduced into the Valley, and from that time agricultural expansion has been continuous. Indio was the trading center for the Valley, and there were settlements in Mecca, Thermal and Coachella. (The waters of the Coachella Branch of the All-American Canal were available in 1948. In 1949 regular deliveries of water commenced. This Branch of the main canal is now 124 miles long, and when all of the laterals are completed, 80,000 acres in Coachella Valley will be irrigated by its waters, waters from the same River which is responsible for the area's colorful history and potential productivity.)

In the fall of 1905 the California Development Company was unable to furnish sufficient water for the winter crops because the first four miles of the canal below the River were silted so much. The floor of the head gate was only three feet below the low water elevation of the River and this was too shallow to take enough water through to prevent silting of the canal. (The Colorado is known to carry nearly ten tons of silt with every acre foot of water. The Grand Canyon is a good example of her erosive powers; for it is this mighty River which has carved a valley 217 miles long and 2,000-6,000 feet deep, bringing the rich load of silt into the Colorado Desert's valleys.)

Because of the silting, during periods of low water the California Development Company had been cutting a by-pass around the head gate to insure a sufficient flow. No damage was done as the gap was always closed before high water. This time, though, the by-pass would not be workable because of so much silt. So, after much deliberation and because of lack of time and of funds to alter the gate, they cut another channel from the River to the canal below the silted four miles. A concession was obtained from the Mexican Government as this channel was about four miles below the Mexican boundary. It was planned to close this before the annual spring floods. The new channel was 50 feet wide and 3300 feet

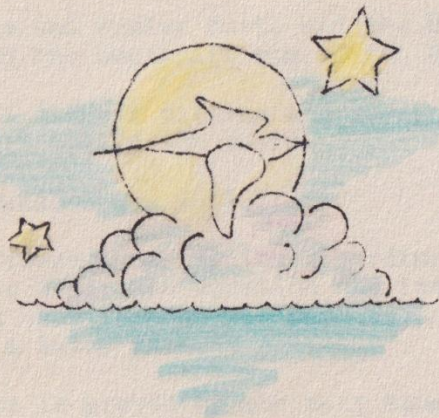
long. It provided ample water for the crops; but in December, when plans were being made to fill in the ditch, an early flood came rushing down the Gila River into the Colorado. An immense volume of water came through the ditch and canal. The waters cut back and widened the ditch but no harm was done. Then, before anything effective could be done, other floods of constantly increasing volume followed; and in April, 1905, the whole River tore through the ditch, her churling waters defying all attempts at control. The channel had widened from the original 50 feet to 800 feet. The waters flooded and eroded the farm lands in the Valley floor before they reached the Salton Basin.

The California Development Company made several unsuccessful attempts to close the breach and efforts of the Federal Bureau of Reclamation were without success. In one year the cut had widened from 50 to 4,000 feet.

It was in September, 1906, after the urging of President Theodore Roosevelt, that the Southern Pacific Railway Company took over the task of diverting the runaway. The main line of the Southern Pacific Railway crossed the floor of the Salton Basin. It was moved three times before the advancing waters.

Desperate attempts were begun. Huge mattresses made of brush and willow trees were sewn with heavy wire and cables and fastened along each side of the bridge. Every available freight car was loaded with rocks and rushed to the ~~scene~~. All quarries from here to New Orleans were used and equipment for the quick-loading of rocks was ready. Day and night rocks were dumped on the mattresses. As the rocks were piled higher the waters became more menacing and the swirling raging torrents cut away the banks and were removing silt from around the rocks and mattresses. It was a terrific struggle for both man and his

adversary, but the men worked swiftly and the rocks were thrown faster than the River could cut away. So, the battle was finally won and the mighty Colorado again turned to the Gulf (February 10, 1907), leaving the beautiful Salton Sea, which is now 35 miles long, 10 to 16 miles wide with a maximum depth of 70 feet.



* The strongest factors leading to the conclusion that the Salton Basin was formed by a settling, or falling away, rather than by erosion, are:

- (1) San Andreas Fault, longest on this continent, lies in a north-easterly position traceable from Santa Barbara to the east shores of the Salton Sea.
- (2) Obsidian Butte and Pumice Butte and the Mud Volcanoes (solfataras) are located on the southeast rim of the Salton Sea.
- (3) The Santa Rosa Ridge's tilting and seeming to plunge southeastward into the desert toward the Basin.
- (4) Position of rockbed and soil.

** There is some difference of opinion regarding the time of the Sea's occupation of this area, its duration and its expanse. However, it is definitely agreed that the Sea was here at one time and that the immense Lake followed at a later date.

The Sea's presence is proved by the many square miles of marine fossil beds, especially oyster shells, found here. In places these beds are 200 feet thick. The shells range from very small to some nine and ten inches across.

The highest ancient shoreline, deposits of travertine which were once under water, and many shells, along with the nature of the salt in the Basin, prove that fresh water occupied the area after the Sea.

One rather recent theory is that the Ocean came in long before the trough was formed, and at the time the earth was subsiding the delta was being formed by the Colorado, so that, contrary to the general opinion for many years, the Gulf of California never did flow into the trough. Every theory seems to be borne out by nature in some respects and contradicted in others. However, the one on which this paper is based is a generally accepted one.

*** The deepest depression of the Basin contained a body of crystalline salt, which extended to a depth of 25 feet below the surface. This salt bed was being used commercially at the time of the flood in 1905. The salt found in the Basin was from the condensation of fresh water rather than the evaporation of Sea water.

**** Now the soil in the Valley has layers of colloidal clay and fine silt as deep as 1,000 feet. This has been deposited here intermittently by the Colorado. The sand in the soil is mostly that which has been washed down from the mountains. More of this sand is found in the northern part of the Basin, farthest from the River's inlet.



FACTS AND FIGURES

1. The Salton Sea is located between Indio and Brawley and extends nearly to Oasis on the North and to Calipatria on the south. It lies in both Riverside and Imperial Counties. The Sea is bordered by Highway 111 on the east and Highway 99 on the west. The main line of the Southern Pacific Railroad (Indio to Niland and Yuma) runs parallel to Highway 111 along the Sea.
2. In ancient times it is known that the Sea covered this area. It is believed that the Gulf of California swept in later, when the earth subsided. The Sea water was followed by fresh water from the Colorado River, forming an immense Lake. The shoreline of this ancient Lake Cahuilla can be seen on the mountains.
3. The Salton Sea was formed in 1905, when the Colorado River broke through an irrigation ditch and flooded the Salton Basin (September, 1905, to February, 1907).
4. The Southern Pacific Railroad ran through the middle of the Basin when the waters came. There was a salt mine in the northern section and there were a few ranches in the Basin.
5. The New and Alamo Rivers, flowing through Imperial Valley, and the Whitewater Channel, in Coachella Valley, along with other drainage ditches and springs running into the Salton Sea, provide enough water to keep the Basin filled to its present level. The Salton Sea is a

natural drainage Basin for approximately 75,000 square miles of territory. The evaporation is equalized by the drainage and the water level is stabilized.

6. Mountains form a perfect setting for the Desert Sea. The San Jacinto Mountains lie to the northwest, the second loftiest in Southern California; the Santa Rosa Range lines the Sea south of these; then to the southwest, the Vallecitos. These mountains are members of the Peninsular Range, which extends into Lower California. It is this great barrier which separates Coachella and Imperial Valleys from the Coastal plains and protects them from the storms which blow in from the Pacific Ocean. To the north are the Orocopia Mountains, then southeast of these and bordering the Sea to the east are the colorful Chocolate Mountains.
7. The Coachella Branch of the All-American Canal takes off just north of the Mexican border a few miles east of Calexico and runs along the foothills east of the Salton Sea, around Indio, and its laterals extend as far as the Imperial County Line, at the northwest end of the Sea. The Coachella Branch is 124 miles long now, and 80,000 acres will be irrigated by its waters when all the laterals are completed.
8. Although the Sea is shallow for several hundred yards from shore, it is 70 feet deep in some places. It is 35 miles long and 10 to 16 miles wide.
9. The surface of the Salton Sea is 241 feet below sea level.
10. The large salt beds left in the Basin by ancient lakes are mostly responsible for the salt content; however, the rapid evaporation now also accounts for some saltiness. The salt content is about the same

as the Ocean.

11. Those who have bathed in these waters regularly have been amazed by the rapid healing of any cuts or abrasions. Many with rheumatism and arthritis claim marked benefits.
12. Swimmers agree that the Salton Sea is ideal for swimming. There is no tide or undercurrent, the waves being governed solely by the winds. The waters are nearly always smooth enough for good swimming and in many places one can go out one fourth mile without being in too deep to touch bottom. Then he may swim as far as he likes parallel to the shore without the slightest danger. There are no holes, treacherous tides or sea life to fear.

Children shout with joy as they play safely along the beaches or in the shallow waters.

The Sea can be very treacherous to those who go far out during the windy seasons. It is the wise hunter or fisherman who travels within easy distance of the shallow waters, for the storms rise suddenly; waves, dashing high, relentlessly and in close succession, give one far out with inadequate equipment small chance to reach safety. Those who are familiar with the Sea have learned to watch for storms. These can be seen coming from any direction by changes in color or roughness of water, white caps and clouds of dust in the distance.

13. Silvery Mullet abound in the Salton Sea. As many as 10 tons are caught

at one time by the commercial fishermen. Any holder of a sporting fishing license may take mullet from the Salton Sea at any time of the year, between one hour before sunrise and one hour after sunset. The daily bag limit is 20 pounds. The fish may be taken by use of the hands, by line with one or more hooks, or by use of dip nets not greater than six feet in diameter.

As the Mullet are vegetarians, it is difficult to catch them with a hook and line. However, they have been caught with a very small hook (#12), baited with redworm, doughball and raisins. Flies have also been used with some degree of success. While feeding along the surface, the Mullet accidentally attempt to ingest these baited hooks.

The Mullet is delicious fried, baked, canned or smoked. It is desirable to remove the skin and the fatty layer just below the big bone along the ribs on the upper side of the abdominal cavity. The fish range in weight from 4 to 15 pounds. They are being canned commercially.

Large schools of Mullet travel the length of the Sea and flashes of silver can often be seen as they jump high into the air. Sometimes the schools stay in one vicinity for several days before moving on. When the water turns greenish along the shore, it is often because of their presence nearby as they are feeding and stirring up the vegetation on the bottom of the Sea. Their stomachs are similar to other vegetarian feeding animals. They have livers and an organ which appears much like a gizzard.

There are two kinds of tiny fish (Cyprinodonts) inhabiting the marginal areas of the Salton Sea. These are desert killi fish (or pup fish) and the mosquito fish. These provide food for the many birds.

Fish from the Gulf of California are being introduced to the Salton Sea by the Division of Fish and Game. However, there are not yet sufficient numbers to provide sport. Those which have so far been planted are: Corbina, Leatherneck, Bonefish, Halibut, Totuava, Smelt, Perch, and Anchoveta.

14. The temperature of the water varies much during the year. In summer it is warm day and night; in the spring and fall it is in the 70's; and in December, January and February it is in the low 60's at times.
15. Occasionally one notes a rusty color of the water along the shore. This is due to the presence of an excessive growth of small microscopic plants. These are free floating during life and when conditions are especially favorable they increase with phenomenal rapidity, so that they color the water.
16. This Sea has the reputation of being the world's fastest body of water because of the low altitude and accompanying density of water. Speedboat races are held in the fall of each year and many records have been set.
17. There were no barnacles in the Sea before the last war; they were brought in on the sea planes.
18. Several types of small shells are found along the beaches and in the soil throughout the Colorado Desert. These are fresh-water shells and were brought in by the Colorado River during her many visits to the Salton Basin.

19. More than 200 varieties of birds inhabit this area. Among those found along the shores of the Salton Sea are: ducks, geese, seagulls, pelicans, teal, snipe, grebe, willet, egret, sandpiper and killdeer. Ducks and geese begin migrating as early as September.
20. The Washingtonia Palm is a native tree of the Salton Basin. These trees sometimes reach a height of 60 or 70 feet. The columnar trunk is topped with a crown of green fan-shaped fronds, some of which sprout each year from the top of the tree, while the old ones beneath dry and fall against the trunk forming a shaggy brown collar under the green. Many small groups of them stand hidden around water seeps in little canyons, and others can be seen from the Highways. They are a sign of the presence of water, but as the trees are very tolerant of alkali, the water is not always sweet. The fruit is small and black, but edible.
21. The "Winning of Barbara Worth," by Harold Bell Wright, is a fact-fiction novel dealing with the reclamation of Imperial Valley. As this story has done much to publicize the Imperial Valley, several businesses there have been named for the heroine, Barbara Worth.
22. Crops: Imperial Valley - Since 1940, when waters from the All-American Canal first flowed into Imperial Valley, agriculture has taken great strides. The Valley is now one of the leading agricultural production areas in the nation. Its controlled farming makes it possible to grow a great variety of products, to produce the year around, and to harvest tremendous per-acre yields, which have been exceeded nowhere.

The Imperial Valley is famous for the nation's earliest melons, and huge truckloads of alfalfa hay are shipped out nearly the year around. Flax and sugar beets are two major crops which have recently been added to the

long list of produce. Per-acre yields of flax are more than three times the national average. Imperial County is the nation's largest producer of beet sugar; one of the most modern sugar refineries in the world has been constructed in the Imperial Valley.

Lettuce and carrots take the lead in the vegetable crops; others are cabbage, peas and onions, tomatoes, squash, cucumbers and asparagus. Citrus fruit, grapes, grain, cattle and sheep all have their places in the vast industry of the Imperial Valley.

Crops: Coachella Valley - Being a winter resort center and the date capital of the world, Coachella Valley's potentiality is tremendous. Thousands of visitors come to see the unusual date gardens and to enjoy the winter sunshine.

Many varieties of dates have been imported to Coachella Valley from the Persian Gulf Region. The Deglet-Noor is grown most widely at present and is grown in no other place in the United States. These are considered the finest in the world.

Of the grapes, principally Thompson Seedless are grown, their chief value being in their early maturity. Coachella growers ship their grapes in June or July, well ahead of other producers.

Grapefruit is the most important citrus. Tangerines are second, then lemons.

The principal garden crops are sweet corn, green beans, tomatoes, onions, lettuce, eggplant, peas, potatoes, spinach, peppers, squash, okra and melons.

Cotton and flax are also important crops.

23. Climate: In the Colorado Desert the sun shines practically the year around. The percentage of sunshine is higher than for any other division of the United States. There are short mild winters and warm summers. Fog and smog are unknown. The prevailing low humidity gives the atmosphere a bracing quality which is entirely lacking in the milder climates.

Along the Sea the summers are from 10 to 15 degrees cooler because of the Sea breezes, which blow almost constantly. During the summer months, winds from the desert come infrequently and for only an hour or so at a time. At these intervals the temperatures may rise as much as 15 degrees in twenty minutes. In the summer the prevailing winds are from the south-east during the day and northeast at night. Winds are strongest in the spring, most commonly coming from the west or northwest.

The Peninsular Range on the west is mostly responsible for the sunshine and clear skies in the Salton Sea Area, Coachella and Imperial Valleys. Few heavy rains pass the lofty barrier into the Valleys below. In the winter one often comes from black thunder clouds and pouring rain in the mountains to blue skies and warm sunshine in the desert region only a few miles away.

Although there are only three or four inches of rain each year, thunder storms do produce heavy local rains occasionally. There are numerous

culverts along the highway through which storm ditches run toward the Sea.

In winter there is a wide variation of temperature during a twenty-four period, as warm days are quite often followed by nights of temperatures as low as 28 or 30 degrees.

Standing on the shores of the Salton Sea in summer, one revels in the gentle Sea breeze as he looks desertward where unmentionable temperatures prevail; in winter, through sunfilled skies one often sees snow or cloud-capped mountains only a short distance away.

