

*Water*

# Water: the desert's most precious, rare commodity

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by Bert Edises

Ruth Kirk, in her splendid book, "Desert: The American Southwest," tells the appalling story of the gold-seeking forty-niners who sought to travel through the Arizona-Mexican desert to the gold fields of California's Mother Lode.

Water was scarce or non-existent along much of this route and the travelers had to make their way painfully from waterhole to waterhole. If through wrong reckoning they missed one of their watery targets, a horrible death from thirst could result.

There is a famous waterhole southwest of Yuma known to early day travelers as Tinajas Altas. It was the only sure water between the spring at Quitovaquito, in what is now Organ Pipe Cactus Monument, and the Colorado River, distant about 125 miles.

A portion of this route was so inhospitable that it became known as "El Camino del Diablo," the devil's highway. Graves here lined the way two or three to a mile; 40 were clustered within the last half-mile of Tinajas Altas, where ample water awaited those who succeeded in reaching it.

The strangest part of the story is that many of the men who perished in the agonies of thirst had unused water in their canteens when they died. They had been taught that in the desert, water should be carefully



## a desert place

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rationed; that it should be consumed only drop by drop, and that men who needed at least a gallon a day for good health and alertness should limit themselves to a cupful.

Such was the traditional approach to water utilization in the hot desert. That approach had been the conventional wisdom for centuries. It was not abandoned until World War II, when American soldiers faced the prospect of fighting the Nazis in the pitiless heat of the North African Desert. It then became essential to know how much water a fighting or working man required and what limitations heat placed on him.

So, a group of scientists under the leadership of Dr. E. F. Adolph, professor emeritus of physiology at the University of Rochester, was given the assignment of studying the conditions of men's survival in the desert. The pioneering work which resulted was called "Physiology of Man in the Desert." Here are some of its findings.

About two-thirds of the human

body is water and the body needs it all. When the body is overheated, as from desert sunlight, the normal response is sweating, which cools the surface of the skin by evaporation.

Water lost through sweating must be replaced; if not, dehydration ensues, followed by eventual death. Taking tiny sips of water at intervals will not halt or reverse the dehydration process.

How much water is needed to keep alive and healthy under hot desert conditions? At a temperature of 90 degrees, men who were inactive and remained in the shade were found to require about five to six quarts of water daily, those moderately active in the sun required from seven to eight quarts, while those working strenuously in the sun needed from nine to ten quarts, i.e., up to two and one-half gallons. Bear in mind that a temperature of 90 degrees is low for the desert in summer.

Under desert conditions water in

quantities sufficient to compensate for the loss through sweating is essential to human survival. If needed water is kept in the canteen, rather than in the stomach, vital functions will be impaired.

In conditions of desert emergency, if water is available, a person should drink the minimum amount needed to quench his thirst. Saving water for future use, rationing it in tiny amounts, rolling pebbles about in one's mouth and similar devices which do not put the needed amount of water in the stomach, have negative physiological value.

Peggy Larson, a disciple of Adolph, in her fine book, "The Deserts of the Southwest," describes practical measures to take if one is stranded in the hot desert.

If you have no water but believe you can walk out, obey the basic rule of the desert: Walk only at night. If you have water and decide to try walking out, carry as much as you possibly can. Each extra quart increases your chances of making it out; the cost in sweat of carrying extra water has been found to be less than 1 percent per hour of the supply carried.

In addition, you should forcefully over drink before setting out: the stomach will serve as an auxiliary canteen capable of carrying one or two extra quarts of water.

If, on the other hand, you decide to stay in one place and rest while awaiting rescue:

1. Reduce sweating by seeking the most complete shade available.
2. Try to find or make an elevated resting place. Ground temperatures can go as high as 160 degrees and be as much as 40 degrees hotter than temperatures 12 to 18 inches above the ground.
3. Don't remove your clothing. Contrary to popular belief the retention of clothing slows down the sweating process, which is the chief cause of dehydration.
4. Wear a light-weight hat or cover your head loosely, as the Arabs do. It will greatly reduce the heat gain and attendant loss of water from the head.
5. If you are short of water, keep your mouth closed to prevent unnecessary evaporation of moisture, refrain as much as possible from talking and do not smoke or drink alcoholic beverages. Don't drink radiator water from your car; it probably contains poisonous substances which can cause severe stomach cramps and worse.
6. And lastly, to repeat, if you have water, don't ration it. Drink the minimum amount that is required to quench your thirst. Otherwise, the loss of water through sweating will not be balanced, and physiological exhaustion will result.