

## PHYSIOLOGY

# When Thirsty—Drink!

This is the advice of scientists, based on new intensive research on the water needs of men stationed in desert climates. Many fallacies disproved.

► “WHEN you are thirsty—DRINK!” That is the advice of scientists who have been conducting intensive research into the water needs and habits of men stationed in desert climates such as at the Army Air Base in the Majove desert, Blythe, Calif.

For weeks these scientists, working for the Office of Scientific Research and Development and under the sponsorship of the Quartermaster General's Department, have been making tests with a selected group of men to determine how much water a man stationed in the desert should drink and how he should drink it. These tests supplement similar work conducted last summer with Army Ground Forces.

Many old fallacies have been disproved and facts have been recorded by Dr. Edward F. Adolph and six associates from the University of Rochester.

“We measure the amounts of sweat lost from a man by his loss of body weight,” Dr. Adolph said. “We find that a man who stops drinking water sweats about as fast as one who continues to drink what he wants. For a few hours, the non-drinker uses some of his body water to make sweat without missing it much. But thereafter he becomes exhausted if any more water is withdrawn from his body. Moreover, to feel comfortable again, he later has to drink the same quantity of water that he would have taken if he had not run into deficit. All the evidence known at present shows that a man cannot do without water, nor be trained to get along with less water.

“A man may fool himself unawares. He may get his water as pop at the PX instead of out of the water cooler or canteen. He may go to sleep and so need less water through less bodily exertion and exposure. He may contrive to work in the cool night instead of in the hot daytime. In such circumstances he might pooh-pooh the idea of a man needing more than a gallon a day. But the man who works in the sun needs two or three gallons in 24 hours in summer, and by no known method can he continuously get along on less.

“Water requirements of average men depend on their activity and on the daily temperature. Our measurements show that on days with maximum temperatures of 95 degrees Fahrenheit, a man must drink at least three quarts of fluid each day and one who works hard in the sun requires as much as seven quarts. On days when the temperature reaches 110 degrees, even the most inactive man (unless he is in an air-conditioned building) must have six quarts

## MEDICINE

## Degreasers Cause Death

Incidental discovery that vapors of chlorinated hydrocarbons affect the heart is believed to explain mysterious deaths and faintings in industry.

► SOME OF the mysterious deaths of industrial workers exposed to the vapors of the chlorinated hydrocarbons, widely used as degreasers of tools and machinery, are probably explained by findings reported by Dr. Arthur J. Geiger, of Yale University School of Medicine (*Journal, American Medical Association*, Sept. 18).

Trichloroethylene and carbon tetrachloride are among these chlorinated hydrocarbons. Besides its industrial uses, trichloroethylene has also been used as an anesthetic and in treatment of certain ailments. It was such a use which led Dr. Geiger to his discovery.

The workers who have lost consciousness and mysteriously died from exposure to these vapors died, he believes, because the chemicals caused ventricular fibrillation, a highly dangerous and usually fatal condition in which the fibers of the heart muscle contract individually instead of together. This kind of contraction is not sufficient to keep the heart pumping blood and unless the condition is promptly overcome, the patient will die. Death by electric shock is due to this damage to heart action.

“Profound loss of consciousness” and a disturbance of heart rhythm “of an ominous type likely to lead to fatal ventricular fibrillation” occurred in a pa-

tient being given trichloroethylene inhalations for migraine headache attacks, Dr. Geiger reports. The treatment was banishing the headaches and lengthening the intervals between attacks. At first the fact that the patient fell asleep for a few minutes during the treatment was not considered remarkable because the chemical was known to have an anesthetic effect. Then it was noticed that her pulse became rapid and completely irregular during the inhalation and that she was not merely asleep but so deeply sunk into unconsciousness that she could not be aroused and did not respond to painful stimuli.

“Early in June two squads of enlisted men and the laboratory personnel tested the ability of men to walk through the desert on one canteen of water per man. Both squads had their last water at 7:30 o'clock. One squad, walking only at night, made over 20 miles. The other squad, resting at night and walking from 10:30 o'clock, could make only 8½ miles. Both squads lost nearly the same amount of water in sweat and therefore suffered the same dehydration, but the night walkers were able to make 2½ times the distance covered by the day walkers in the same time. This illustrates the advantage of doing work in the coolest part of the 24 hours whenever water is precious.”

*Science News Letter, September 25, 1943*

Electrocardiograms showed the heart disturbance. The same condition occurred when carbon tetrachloride was substituted for trichloroethylene, but not when amyl acetate was given. The arter chemical, moreover, failed to relieve the headache as the chlorinated hydrocarbons did.

Greater vigilance in protecting industrial workers from even short exposures to moderate concentrations of the fumes of these chemicals is called for by Dr. Geiger, who adds a warning to physicians about the dangers of the medicinal use of trichloroethylene.

*Science News Letter, September 25, 1943*