

PHYSIOLOGY

Adrift for Science

Officers and enlisted men who were purposely "lost" at sea gain information on how to stay alive and avoid injury. Test lasted six days and six nights.

► **MILITARY AIRCRAFT** patrolling the Gulf of Mexico 20 miles out of Tarpon Springs, Fla., spotted two rubber life rafts drifting in the waters below them. To all appearances the rafts were occupied by the survivors of a crash landing at sea. In reality, the men were officers and enlisted men who had volunteered to test the life rafts, equipment and rations furnished as emergency equipment on bombardment airplanes of the Army Air Forces. The test lasted six days and six nights, and the information gained by these men throws new light on the problems of survival at sea.

The test was under joint supervision of the Flight Control Command, Winston-Salem, N. C., and the Medical Branch of the A. A. F. School of Applied Tactics, Orlando, Florida. The test took place last summer (*See SNL, July 31*). It is now possible to give details of the objectives and results. The objectives were:

1. To learn whether it is best to drink large quantities of water prior to being cast adrift.
2. To determine the advantages or disadvantages of keeping the clothing saturated with sea water in an attempt to conserve body fluids.
3. To find the relationship between such factors as exercise and exposure to the sun and the rate at which the body dries out.
4. To compare the advantages of drinking large amounts of water after prolonged dehydration with hoarding water collected and drinking small amounts of it at more frequent intervals.
5. To test the effectiveness of various sunburn lotions and creams.
6. To determine the desirability of including certain items of diet now provided as emergency rations.
7. To determine the practicability of all equipment in the life raft kits.
8. To provide a source of information based on practical experience for teaching purposes.

At 4:30 on a Sunday afternoon nine officers and enlisted men, wearing light

flying suits, fatigue hats, socks and shoes, went overboard from the Army Crash Boat P-269 into the two life rafts. For the next 135 hours, or until approximately 6:00 a. m. the following Saturday, all but one of these men remained constantly on the rafts, except for short periods on board the attending crash boat where daily medical studies were made. This presented an excellent opportunity to study both the equipment and the physical and mental reactions of the men on board the rafts.

Rain Drenched Them

During the first night, five men occupied the five-man raft and four men the seven-man raft. Throughout the night rain and wind kept the rafts and their crews constantly alert and continually drenched with sea water. Sleep was impossible for anyone. After the first few hours of wind, rain and heavy

seas, one of the four men on the seven-man raft became so violently seasick that he had to be taken off the raft.

This man lost eight and one-half pounds during the night and went into fairly severe shock, so that neither his pulse nor his blood pressure were obtainable at times. He also became disoriented and confused. From his experience it became quite evident that seasickness can become severe enough while adrift on a life raft to result in death.

The next morning, inspection of the kits fastened to the floors of the life rafts showed that because of the lack of water-tight closures on the kit containers, almost half of the equipment was ruined and had to be discarded. Signal flares were soggy and unusable, the first-aid kit was completely soaked in sea water, the Very pistol was badly rusted as was a .45-caliber automatic pistol placed in the five-man raft kit for safe-keeping, and the rubber patching kit was so badly water-soaked that it could not have been used to repair even a small puncture or rip in the raft.



TARPAULIN CANOPY—Results of tests carried out by nine Air Force men showed that those who did not rig up over them some sort of covering to protect them from the blistering rays of the sun felt the effects of dehydration considerably more than the men on the covered raft.

MORAL for aviators: Inspect the life-raft kit in your airplane and place flares, first-aid kit, and any other pieces you feel may be ruined by salt water, in waterproof bags. If you can get them, water-proof icebox bags will do nicely. Grease your knife, Very pistol and automatic before every long over-water flight.

Because of the extreme crowding, with five men on the five-man raft, two of the five men moved to the seven-man raft the following morning; and for the rest of the test three men occupied the five-man raft and five men the seven-man raft.

Duties Were Assigned

To make the test as complete as possible various duties were assigned to each man. Throughout the following day the men on the five-man raft attempted to protect themselves from the sun by stretching a tarpaulin over the raft, while the men on the seven-man raft had no such protection. As a result, by the end of the day, the men on the seven-man raft were feeling the effects of dehydration considerably more than the men on the five-man raft.

MORAL: Use oars, sail and/or tarpaulin, yellow side up, to rig a canopy over the raft. Besides protecting you, it will make the raft easier to see.

During the first 24 hours, none of the men had either food or water. After that, seven of the eight men were given a reduced ration of one standard K ration box and about two-thirds of a pint of water a day, while the eighth man continued to do without food or water for four days and four nights. This last man, a 38-year-old officer, experienced no great hunger or thirst after the initial period of accommodation to conditions, indicating that with proper personal discipline even a considerably longer

period of fasting is possible for anyone in good physical condition.

MORAL: When you have no water, don't eat dehydrated or dried heavy foods.

Before going on the raft, this officer had fortified himself by drinking large quantities of fluids—the total equal to more than three times his usual daily consumption. To this, and the fact that although an inveterate smoker he stopped smoking when he got aboard the raft, he attributed his lack of any great feeling of thirst for the 96 hours.

MORAL: Don't smoke if you have no water, and force yourself to drink all the liquids you can hold before and during all long overwater flights.

On the third day, two of the men became so completely dehydrated that an additional water ration became necessary. The men were weak and mentally confused. Each was given two quarts of water, which he drank within an hour. Contrary to general belief, they experienced no feeling of nausea but quite the reverse—a feeling of renewed strength and a brighter mental attitude. A careful medical check of these men during the next 36 hours showed that they retained most of the water taken.

MORAL: If you collect rain water, immediately drink as much of it as you can comfortably hold. The body can store water and it makes a far better container than a bailing bucket or a tin can. Store the rest, preferably in the regulation water cans already emptied. Some of the water taken in large quantities when you are dehydrated is lost through perspiration or excessive kidney excretions. However, a quart of water in your body is worth several stored where they may be lost if the raft tips over or spoiled by sea spray and salt.

For the duration of the test, one man kept his clothes continually wet with sea water and at the same time kept himself out of the sun as much as possible. Without any greater feeling of thirst than the rest of the men, he was able to exist with considerably less than the regular daily ration of water.

Clothes Should Be Kept Wet

MORAL: In shark-free waters in warm climates during sun-up hours, dunk yourself, clothes and all, periodically. Lower yourself over the side slowly to keep your face and mouth out of the sea water. Don't exert yourself by swimming. If one's general condition precludes dunking, the clothing may be splashed with sea-water instead.

During the third and fourth days, two men who had had little previous fishing experience were detailed to test the life-raft fishing kit. They were handed the kit and given no further instructions. Selecting the largest hooks and lines, they fished for several hours. Result: No fish. It was then suggested to them that they try the smaller hooks and pork-rind bait provided in the kit. Within 20 minutes, a small fish was hauled aboard. That was then cut up for bait and used on the larger hooks. Within an hour, two 10- or 12-pound fish had been caught.

MORAL: Don't go after the big fish first. Catch small ones with small hooks baited with pork-rind and cut up the small fry for baiting the larger hooks. Don't try to hook excessively large fish, they will only break the line and run off with your hooks and bait.

Medical examinations made before, during and after the test showed total weight losses ranging from one to ten pounds with the average loss somewhat over a pound a day for each volunteer during the six-day period. The thinnest men at the start had lost the most at the end, the fattest the least.

Few Physical Changes

Except for a general weariness and mental fatigue, there were few changes physically in the men. A comparison of the results of the physical examinations for flying given before the start of the test and those given at the conclusion showed only minor variations.

Circulatory systems showed no evidence of deterioration. The eyesight of all volunteers remained normal in spite of the daily exposure to wind and sun.

The greatest single factor contributing to the general weakness which first evidenced itself on the second day was the inability to get comfortable enough in the rafts for restful sleep. The best position was found to be crosswise with the men alternating feet first and head first, but even in that position it was difficult to sleep for more than a half to throw quarters of an hour at a time.

Out of the test also came a number of suggestions for additions and changes in the life-raft rations, medical kit and equipment kit.

Science News Letter, November 13, 1943

Magnesium production in the United States has increased nearly a hundred-fold over the 3,000 tons produced in 1938, principally for use in airplane construction.

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