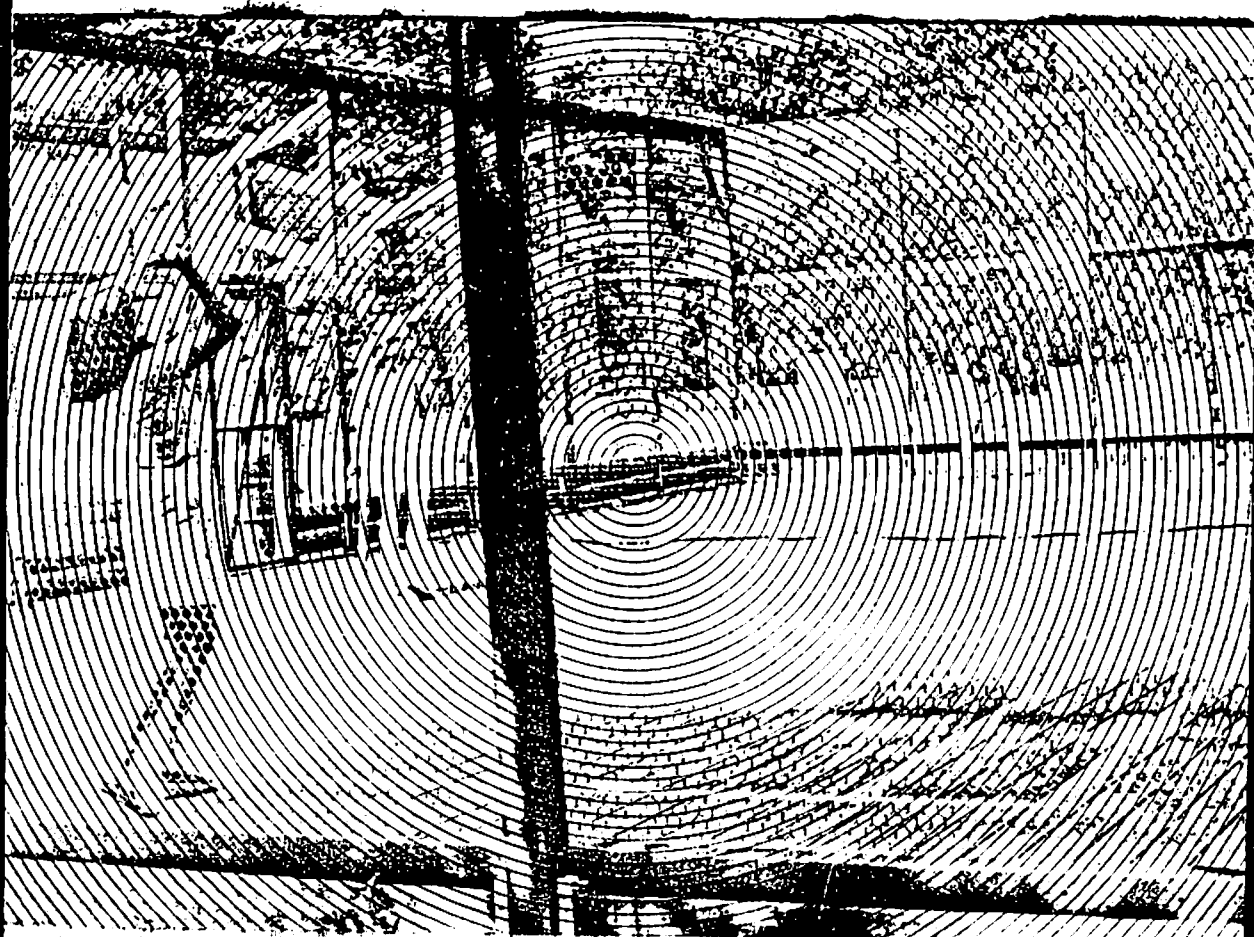



# THE JOURNAL OF PHYSICAL EDUCATION

JULY/AUGUST VOL. 71 NO. 6



THE   
Paddle Boom!

COVER STORY PAGE 162

# OBSERVATIONS ON THE DROWNING OF NON-SWIMMERS

BY FRANK PIA

The primary purpose of this paper is to enable lifeguards and lifesavers to recognize drowning non-swimmers at the earliest moment to their plight. It has been written in the belief that the options available to rescue personnel need to be multiplied, training procedures revised, and above all that the prevailing concepts upon which the rescues of non-swimmers are based are mistaken.



Mr. Pia

Recognition of victims, the root of the rescue process, traditionally has been treated by describing drowning as, "...convulsive agitation which advertises the fact that the person is drowning," or hurriedly dismissed altogether as self-evident. Neither of these two treatments begins to answer novice rescue personnel's most frequently-asked question, "How will I know when someone is drowning?" The footage in **ON DROWNING** clearly shows that a drowning person's instinctual response to being in water over his head is more definable than "convulsive agitation." And, judging by the unaware onlookers in each of the sequences, the drowning non-swimmer neither advertises the fact that he is drowning, nor is it self-evident to any except the trained eye.

---

*Mr. Pia wears many hats (and quite well). He is Chief Lifeguard at Orchard Beach, Supervising Chief Lifeguard Bronx, NY and Coordinator of Student Affairs at Morris High School in the Bronx.*

A further complication to this problem has been added by the past and current philosophy of the Safety Services Division of the American National Red Cross which, despite requests from individuals within their program, has not developed a lifeguard training and certification program. This philosophy continues to be sanctioned by officials within the Safety Services Division, even with the knowledge that senior lifesaving certification is used by management as the criterion for staffing pools and waterfront areas with qualified rescue personnel and by individuals to obtain employment as rescue personnel.

For these reasons it is essential that lifesavers and lifeguards be trained in the most efficient rescue techniques possible. It is equally essential that rescue techniques cited in the standard texts for training lifeguards and lifesavers be based on a realistic assessment of what happens when someone is drowning.

It should be noted at this point that the Y.M.C.A., cognizant of the fact that senior lifesaving courses were not meeting the needs of lifeguard training, which was not and is not their intent, has developed a lifeguard training course. However, since senior lifesaving is still a prerequisite for registering in their lifeguard course, it is imperative that rescue techniques taught in senior lifesaving be based on empirical data rather than on a priori speculation.

Basically there are two types of water crises, distress situations and drowning situations.

Distress situations are those in which swimmers with varying degrees of skill are unable, because of tidal conditions (surf or tip tides) or fatigue, to return to shore without some assistance. The important thing to remember about this type of victim is that because of his swimming skills, among which I include floating he is either positively or neutrally buoyant. This type of crisis is most typically found at surf beaches.

Drowning situations involve **NON-SWIMMERS** who, for a variety of reasons, suddenly find themselves in water above their heads. A non-swimmer is defined here as an individual who cannot support himself by swimming or floating. The important thing to remember about the drowning non-swimmer is that while drowning, his buoyancy alternates between negative and neutral buoyancy, and that the rescuer must first support the victim before he begins to tow him back to safety. This crisis is most typically found in pools, lakes, and other non-surf areas.

For a graphic illustration of these differences, please study carefully the actions of the small heavyset girl in my film whose actions change from a drowning non-swimmer to a distress victim. Distress victims may be likened to a boat afloat, in no immediate danger of sinking, but without power to return to shore. A drowning non-swimmer may be likened to a boat which has a leak in it and is beginning to sink. The former needs only to be towed into shore, while the latter needs to be supported, prevented from sinking, and then towed into shore.

It is my contention that existing rescue techniques do not differentiate between distress situations and drowning situations and offer rescue personnel techniques tailored to meet the demands of only distress situations. I base this contention upon the fact that to be effective all the existing rescue techniques, including the conventional cross-chest carry, require some self-support by the victim, which in the case of non-swimmers is by definition absent.

I believe this contention can be supported in two ways: first by describing the behavior of non-swimmers and second by providing empirical data, the 16mm training film *ON DROWNING*, against which my descriptions and existing and proposed modifications in rescue technique can be evaluated.

The following description of the behavior that non-swimmers exhibit while drowning is based on two sources. First from my fourteen years of ongoing experience as a lifeguard and lifeguard supervisor at Orchard Beach on Long Island Sound where as many as 2,000 non-swimmers may be rescued each summer. Second, from a slow-motion 16mm color sound film, *ON DROWNING*, which recorded the movements of actual drowning people. This film made possible an objective analysis of the frantic struggle of non-swimmers from the beginning of their difficulty, through its development, to their subsequent rescue. Because of the non-tidal conditions at Orchard Beach, the conclusions reached here apply as well to the drowning of non-swimmers in pools and lakes.

When drowning, the victim:

1. Rarely is able to call out for help. This seemingly odd fact becomes believable when one remembers that breathing, not speech, is one of the primary functions of the respiratory system. Therefore, in time of extreme peril in water, breathing must take precedence over speech. I believe that this phenomenon accounts for the fact that throughout *ON DROWNING* you will see onlookers watching a person drown, unaware that he is drowning because he has not called out for help. It must be noted, however, that there have been some isolated instances at Orchard Beach when a drowning non-swimmer has called out for help.

Cigarette smoking can rob you of years of life. Nobody likes a quitter, but we do say the American Cancer Society.

2. Has instinctual arm movements which, unlike the hailing or waving of distress victims, appear to push the victim upward in the water by thrashing the water with both arms partially extended from his sides. Analysis of *ON DROWNING* has shown that the arm movements of the non-swimmers are actually instinctive efforts to keep their heads above water and remain breathing. Because this action is instinctive, it is common to all non-swimmers, regardless of swimming areas. Once a non-swimmer is in water over his head, instinct forces him to react. These instinctive reactions which form a definite pattern are the basis of my film. This type of arm movement cannot propel the victim in any direction, but can merely raise and lower the victim in the water as he tries to breathe.

3. Usually manages to turn toward shore, with his body in an upright position, with no apparent support kick.

As the drowning progresses, the victim's head sinks lower in the water. His arm movements become less visible — and more feeble — until only the top of his head and grasping hands may be seen.

The whole process may be as long as 60 seconds or as short as 20 seconds.

Despite the differences between distress situations and drowning situations, rescue techniques have been shaped almost entirely to deal with distress situations. That is, to be effective these techniques rely upon the victim's being able to support himself in the water. The persistent theoretical use of the ring buoy as a rescue device for non-swimmers well illustrates the point. I used the word theoretical because I have not heard of any repeated instances in which a drowning non-swimmer was able to reach out and grab a ring buoy.

"The ring buoy was originally designed for use on ships by an Englishman named Carte. The large cumbersome buoy had to be lifted from a rack and dropped overboard. The victim then had to swim to the buoy and hold on until a long boat could be lowered to recover both the victim and the buoy. "The design of the buoy was later modified for use on shore by making it smaller and attaching a line to it."

Current Red Cross lifesaving procedure dictates that the rescuer toss the buoy, which usually is not of itself large enough to fully support the victim, to a point a little behind the victim's head and shoulders. The ring buoy is, therefore, used as just an object for the drowning person to hold onto while being drawn ashore, rather than for its original purpose of supporting the victim.

To avail himself of the buoy, a non-swimmer must first see the buoy, an extremely difficult task since he is usually blinded by his alternate sinking and reappearing movements. If he can see the buoy, he must then, as he struggles upward, cease thrashing his arms and grasp the buoy or line — a task that requires the swimming skill of a supporting kick which by definition the drowning non-swimmer doesn't have.

In order to prove or disprove this contention, I conducted the following experiment at Orchard Beach during the summer of 1972. Rather than rescue a victim who had stepped off the low-tide shelf with a swimming rescue, I swam to a 16-year-old male and pushed a large canvas ring buoy, the type found on large seagoing vessels, to a point within 3 to 6 inches of the drowning non-swimmer's face. Simultaneously I yelled, "Grab it. Grab the buoy!" The instruction was repeated in Spanish. While I was sure that the victim saw the buoy, a fact confirmed by later questioning, the victim made no movement toward the buoy with either his body or his hands. I then pushed the buoy under his thrashing right arm. His arm came down into the center of the buoy and the section of the buoy closest to his body supported him under his arm. I then yelled, "Pull the buoy in front of you!" The victim replied, "I can't. Please help me." I then reassured the victim he would soon be all right and began towing him into shore which was only a few feet away. This entire sequence of events was filmed from a lifeguard tower and will be included in my book *A Primer of Lifeguarding*.

Later that day I threw a line with a small ring buoy attached to it to another young boy who was drowning. The buoy landed behind the boy, and the attached line was draped over his shoulder. I waited a few seconds and when the boy made no effort to grab the line, I dived into the water and rescued him. When I asked him onshore why he didn't grab the line, he replied, "I didn't see it." We were unable to capture this sequence on film because while I was throwing the line to this boy a triple drowning occurred on the next section which necessitated that my amateur photographer assist his fellow lifeguards in rescuing the triple drowning.

It should now be abundantly clear that by throwing a ring buoy to a drowning non-swimmer, we are asking him to perform an action that is physiologically almost impossible for him to perform, namely to stop drowning by supporting himself temporarily and then reach out and grab the buoy. The distress victim can do this; the drowning non-swimmer rarely can.

The Red Cross Lifesaving Manual groups swimming rescues into three classes: rear approach, front surface approach, and the underwater approach. The reasoning behind the underwater approach, which is the most heavily stressed approach, is explained as follows in the Lifesaving Manual: "Few people drown facing away from shore. By some means they manage to turn towards land in their struggles to reach a place of safety. As the rescuer most frequently comes from shore, he is faced with the problem of contacting and turning the victim from a position directly in front of him."

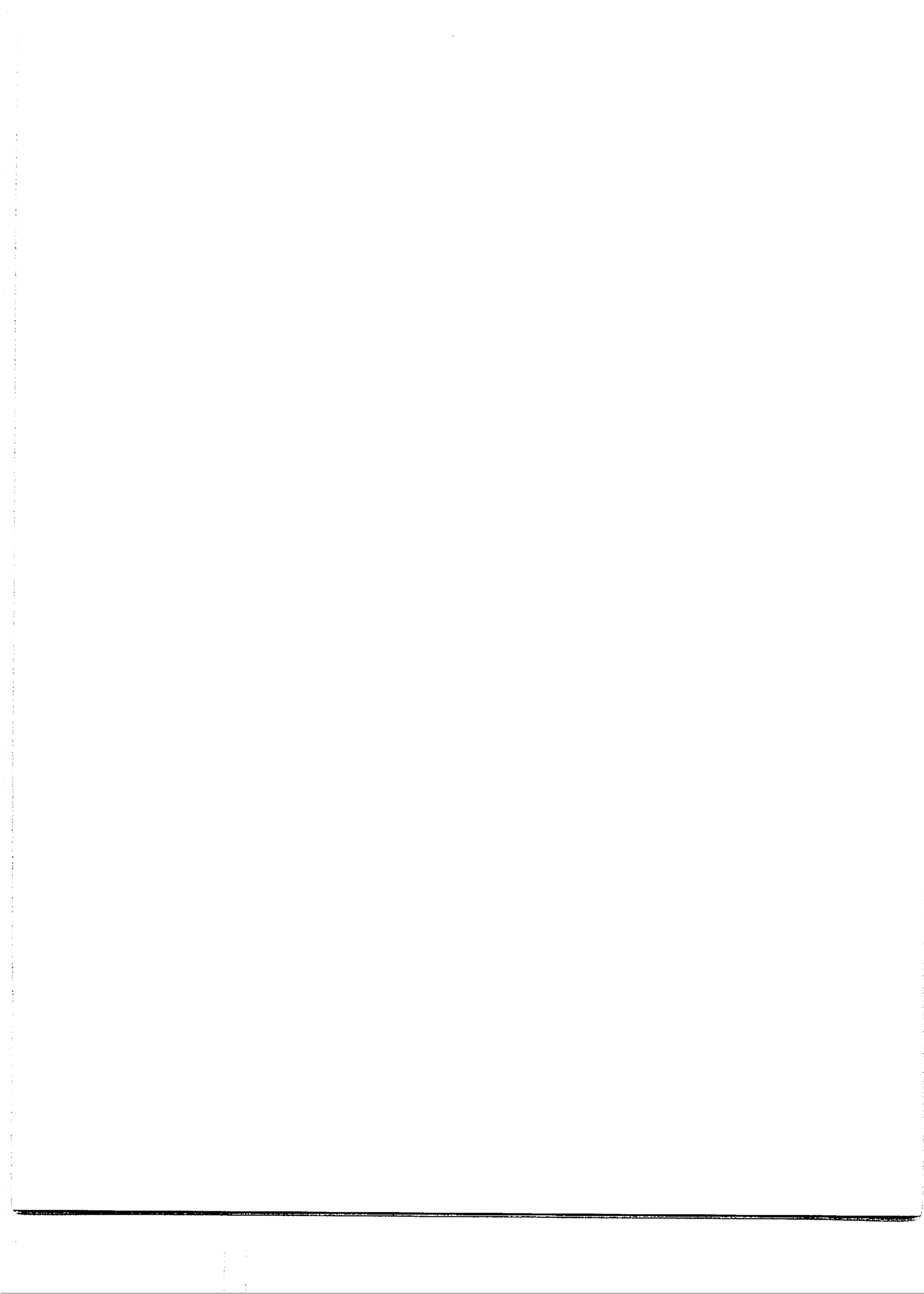
One must immediately ask the following question concerning the above reasoning: "Why must the rescuer turn the victim away from his only link with safety, the shore? Turning the victim away from shore will only present him with a view of more water, which and understandably because of his current condition, will increase rather than decrease his panic. Must the victim be turned in the water before he is fully supported, for the rescuer to effect his rescue?" This question will be answered later in this paper.

The standard method for dealing with this problem is cited in the Lifesaving Manual as follows:

If the victim's head is still on the surface as the rescuer nears him, the procedure is as follows: At a point 6 to 8 feet more feet away, the Lifesaver does a quick surface dive descending almost perpendicularly to a position below the level of the person's feet. At that point he turns and swims upward on a diagonal toward the victim's knee. The eyes are kept open and the gaze fixed on the victim at all times in the surface dive. If the water is clear, eye movement can be noted. If the water is cloudy the outline of the victim's body may be seen against the light. The rescuer takes a crouching position with the legs slightly forward on the chest. When the opportunity comes the rescuer seizes the legs just above the knees and with one hand on the front of the thigh and the other on the back of the other thigh, the victim is turned about. The rescuer then slides up behind the victim keeping contact with the hands on the victim's sides at all times until he nears the surface. The hand is then thrust over the shoulder to grasp the chin and the same process of leveling as employed in the rear approach is continued...At night or in extremely dark or muddy water the surface dive is made in line with the victim's legs and discovered by groping.

One must look rather critically at the technique which calls for the rescuer to dive perpendicularly, swim diagonally, then swim upward, crouch, wait for opportunities, grab struggling legs, twist thighs, and finally slide up behind the victim — all to avoid the grasp of, and change the position of, the victim.

For one, the swim to the victim, the dive and the underwater swim and the subsequent wait — all call for an expenditure of energy and swimming skills that are often beyond the proficiency of most lifesavers. Also, while underwater, the rescuer must rely mainly on kinesthetic rather than visual cues, and when surfacing he must first concern himself with replenishing his own oxygen supply, rather than with the safety of the victim.



Rather than approach and contact the victim underwater, it is far more logical, in terms of both speed and safety of the rescuer and victim, for the rescuer to continue his surface swim and approach the victim of a diagonal a foot or so beyond the victim's outstretched, thrashing arms. Once behind the victim, the rescuer need not fear being grabbed and can easily select the most opportune moment to grasp the victim. By grasping the victim as he is thrashing his arms down on the water, the rescuer can turn the remaining buoyancy to his advantage. And since the victim is taking in air at this point, his reduced panic will also facilitate the rescue.

As mentioned, the most important factor in the rescue is support of the victim. One finds no such statement in any lifesaving or lifeguarding manuals, only the following instruction calling for time-wasting sequential movements rather than simultaneous ones: "It is therefore necessary for the rescuer to avoid the grasp of the victim, put him under control, boost him to a horizontal position, and get underway for the carry."

The lifesaver's fear of being grabbed by the victim, when considered against the evidence of how drowning non-swimmers actually behave, clearly is a fear based more on myth than on fact. For a non-swimmer cannot propel himself in any direction (having no swimmer skills), therefore he cannot move toward the rescuer. Nor can he reach out and grab the rescuer because this act requires a supporting kick. A rescuer can only be grasped if he applies faulty technique or swims directly into the victim's grasp. Putting the victim under control is the real problem of the rescuer, for a non-swimmer will only cease struggling when the lifesaver supports him in such a manner that drowning no longer seems imminent.

The initial stage of the rescue, the chin carry, provides the victim no such assurance. The chin carry was designed to change the victim from a vertical to a horizontal position so that he can be grasped in a chest carry. But from the moment the rescuer grabs the non-swimmer under the chin until he has him firmly supported in the cross-chest carry, only very limited support and very limited control may be maintained over the victim. The major shortcoming of the chin carry is that while the rescuer is cupping his hand around the victim's chin and wedging his forearm between the victim's shoulder blades, the victim is still primarily dependent upon his own ability to support himself — an ability which in the case of non-swimmers is non-existent. And while trying to bring the victim's body to a horizontal position, the rescuer without meaning to, often may further increase the victim's panic by covering part of the victim's air passage with his hand.

To illustrate the hazards and complications that can arise from using the chin carry on drowning non-swimmers, please study the sequence in *ON DROWNING* in which the lifeguard attempts to use the chin carry. At my instruction the lifeguard grabbed the victim in the chin carry, but not being able to support her fully, which the chin carry cannot do, he gives her only enough support so that she can reach over her shoulder and grab his hair. He submerges and again applies the chin carry. In attempting to level her off, he pulls her from an upright position into the water, which is the last place in the world that a drowning non-swimmer wants to be. She then grabs his hand, pulls it away from her face, and turns her exasperated face towards his. Since we have seen and know by our practice and in senior lifesaving classes that the chin carry can work only on victims who can support themselves (distress victims), why do we use it on victims who cannot support themselves, thereby exposing both the victim and the rescuer to needless hardship and potential danger?

To eliminate the aforementioned rescue hazards, the following modifications are proposed:

1. After the lifesaver has identified his victim as a drowning non-swimmer and not a swimmer in distress, he should view the rescue as a two-step procedure. First, support the victim in an upright position with his head fully out of the water, thereby convincing him that drowning is no longer imminent; and then tow the victim into shore. There are many rescues in the film which illustrate this technique. Notice that when the victim's head is out of the water with his body in an upright position, he does not make any attempt to grab the rescuer. If you look carefully at the expressions on the victim's face, you will notice that it quickly changes from deep anxiety to joy. Contrast these expressions with the one on the girl's face when the lifeguard tries to apply the chin carry. Ignoring the needs of the victim by attempting to support and tow simultaneously, while still possible, places needless hardship and potential danger on both the rescuer and the victim. If you study the film, you will notice that there are a number of instances in which the lifeguard, after he has supported the victim in an upright position with the victim's head out of the water, calms the victim by talking to him. In one sequence a young boy replies "okay" to the lifeguard's instruction. Evidence gathered at Orchard, Beach shows that when drowning non-swimmers are fully supported in the water, they become highly receptive to oral directions from the lifeguard, which further facilitates the rescue.

CONTINUED PAGE 181

**Coming In The September/October Issue  
IS THERE A DIRECT LINK BETWEEN PHYSICAL  
WELL-BEING AND CRIMINAL BEHAVIOR?  
READ DR. RUDOLPH JIRKA'S  
"THE ALLERGENIC CONNECTION?"**

2. As proposed earlier, the rescuer should approach the victim from the rear, support him, and then grasp him in a cross chest hold. In this technique the rescuer reaches under, rather than over, the victim's shoulder and then across the victim's chest. Thus the victim is supported in an upright position with his head out of the water by the rescuer's having the victim's buttocks resting on his hips.

Experience at Orchard Beach has shown that victims rarely, if ever, permit themselves to be towed horizontally in the traditional cross chest carry; but rather they attempt to sit upright on the rescuer's hip. The traditional cross chest carry cannot work on drowning non-swimmers because as the rescuer puts his arm across the victim's chest, he causes the victim's head and body to sink lower in the water. In effect what the rescuer is doing is pulling the victim back down into the water, a highly questionable practice!

Some individuals have objected to this rescue technique, claiming that it is too difficult for lifeguards to execute. My own feeling in this matter is that if a lifeguard's swimming skills are so weak that he cannot tow a victim 25 yards with the victim sitting upright on his hip, he has no business being employed as a lifeguard.

The front surface approach, the rescue approach not yet considered, falls into a special classification dictated by circumstances cited in the Lifesaving Manual:

"If the lifesaver nears the victim and finds that his head is beneath the surface and one or both arms are showing, he should waste no time making a surface dive...At arm's length from the victim, the rescuer watches for his opportunity to seize one of the wrists. Reaching in with a swift movement of the arm, either right to right, or left to left ....When a firm grip is secured, the rescuer immediately leans back and pulls the victim across the body, twisting the wrist in line with the pull. Simultaneously, the legs deliver a series of quick, short thrusts, thereby aiding in turning the drowning person about and getting under-way. When the victim's back is fully turned, the wrist is released and the leveling process is completed in the same manner as the rear approach."

Novice lifesavers are always puzzled and somewhat shocked when they first try the front approach on a non-swimmer whose head is still above the surface of the water. As they find themselves face to face with the victim, with one of the victim's arms encircling their head.

The reason for this occurrence is quite simple. The front surface approach was designed as a lifting and pulling motion. It can only be used when the victim's head is at least

a foot below the surface of the water. If the victim's head is still on the surface when the rescuer tries the front surface approach, the victim, anxious for support, will lock his wrist, elbow, and shoulder joints in a rigid, extended position as the rescuer grabs his wrist. Then when the unsuspecting rescuer leans back and tries to pull the victim across his body, he finds suddenly that the victim is lying on him with one arm firmly clasped around his neck. This happens so quickly under emergency conditions that all the rescuer can recall later is a kaleidoscope of events in which an approach which worked so well in the training program suddenly turns into disaster in actual practice. The lifesaver's fear of being grabbed by the victim is only reinforced by such mishaps.

Such mishaps are caused by bad habits acquired in the Senior Lifesaving Training Course. The instructors drill their students in the front surface approach by having the "victims" obligingly extend both arms in front of themselves, rather than by having them simulate the actual drowning movements — thrashing the water with both arms extended laterally, with the head submerged. Awareness of how a drowning man behaves should eliminate this problem.

Some individuals with only experience as surf lifeguards have questioned the absence of rescue buoys and the practice of my lifeguards' swimming very close to the victims when making their rescues. I am in complete agreement with the practice at most surf beaches that requires lifeguards use a torpedo buoy on all rescues. The reason we do not use torpedo buoys at Orchard Beach is that we are not faced with a long swim and subsequent tow through the surf line. Because non-swimmers cannot move toward the rescuer like distress victims in surf rescues can, my lifeguards are not concerned with being grabbed by the victim.

It is hoped that this paper will serve as a guide that will enable rescue personnel, be they lifeguards or lifesavers, to assess intelligently a victim's plight and then tailor their rescue accordingly. **Y**

*Editor's Note: This article should be used with "ON DROWNING", a 16mm color and sound educational film to study and record the movements of people actually drowning from the beginning of their plight through its development to the subsequent rescue of these people. Write: Water Safety Films, P.O. Box 17, City Island, Bronx, New York 10464.*

