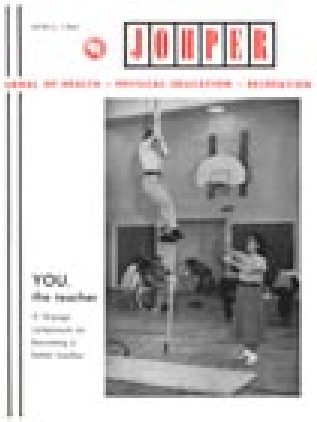

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Evidence and Opinions Related to Swimming after Meals

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RESEARCH BULLETIN
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EVIDENCE AND OPINIONS RELATED TO SWIMMING AFTER MEALS

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It is a commonly held view that there is special danger of drowning if one goes swimming shortly after eating. The origin of this idea is not easily traced. The writer once read that the American Indian prescribed massage of the abdomen to make after-eating swimming safe. The American Red Cross has steadfastly favored staying out of the water for one or one and one-half hours after eating. The current issue of the American Red Cross *Life-Saving and Water Safety Manual* presents a carefully worded statement concerning the lack of scientific evidence and favors the traditional position as follows: "wait until the initial processes of digestion are well under way before entering the water, which would be well within the hour or hour and a half period usually prescribed." In the Red Cross First Aid Instructors book one finds, "Don't swim if you are over-heated, overtired, or right after eating."

It is surprising that a rule of this kind has been so long recommended for rigid enforcement without any scientifically valid evidence. When questioned, the American Red Cross indicated that there were no statistical studies relating drownings to the recency of eating but that this rule, as others, was based on a consensus of opinions expressed by a panel of physicians. There is no indication that any of these physicians have objective evidence in support of their opinions. The Red Cross rightly implies that an overly full stomach might interfere with breathing movements of the diaphragm.

Most generally one hears that swimmers will suffer "stomach cramps" and there is advanced the supposition that digestion "draws" blood away from the muscles or the muscles "draw" blood from the stomach. No one is certain as to what is meant by "stomach cramps." Professor Percy Dawson once suggested that the ileo-psoas muscles might cramp.

Observations from Physiology

Physiological studies on animals and man dealing with the effect of physical exercise on the motility and the secretory activity of the stomach date back to 1849. They may be summarized as follows: Physical exercise of even strenuous nature short of exhaustive fatigue, when unaccompanied by strong emotion, does not significantly modify stomach motility or secretion. On the other hand, strong emotions even in the absence of exercise generally inhibit stomach motility and secretion. There are a number of studies in which reduced motility and blood supply to the stomach and intestines are found in dogs when first faced with unaccustomed running tasks, but such inhibitory effects always "wear off" when the animal becomes accustomed to the activity.

The reflexes that are elicited by the exercise state are no doubt prepotent over those involved in digestion. One such reflex adjustment causes vasoconstriction in the digestive apparatus. But during exercise the arterial blood pressure is markedly raised and the cardiac minute volume may be increased eight to ten fold. There is at least one study on dogs which indicates that this increased circulatory volume and power is sufficient to supply the viscera with an unchanged blood volume through the narrowed diameters of their arterial supply.

There is also some mention in the literature of a gastrocoronary reflex that is presumably elicited by distention of the stomach and causes a constriction of the coronary vessels. Because this reflex might be a source of cardiac embarrassment following a large meal, we conducted an intensive study at George Williams College designed to detect any changes that might occur in the human electrocardiogram following distention of the stomach by balloon inflation and by a large meal. In scores of tests we were unable to discover any changes in the electrocardiogram that would indicate a reduced blood supply to the heart. We did correlate some changes with X-ray verified mechanical shifts of the heart in accommodation to the stomach distention, but this is harmless.

New Conclusions

Findings such as the above led a joint committee of the AAHPER and the AMA to release carefully worded advice on the subject, first in 1943 in an officially adopted statement and again in 1958. These statements published simultaneously in the journals of the AMA and the AAHPER read in part: "Evidence as to the effect of exercise on digestion indicates that physical exertion does not necessarily interfere with the digestive process, although strong emotion may do so even unaccompanied by exercise. Laborers and farmers customarily work hard immediately after meals. On the other hand, it has been found advisable for athletes to eat their pregame meal three or four hours prior to competition in activities involving emotional stress."

Many athletes report swimming long distances regularly in training almost directly after eating, although they would not do this prior to competition. It is responsibly reported that in its summer leadership training programs the American Red Cross also schedules swimming activities directly after meals.

A professionally trained physical educator who for many years has carried responsible leadership for the American Red Cross, for the YMCA, and for community programs permits us to quote him as follows:

"I have never seen a case of so-called stomach cramps. I am familiar with cramps of thighs and legs. These are generally associated with swimming in cold water or when fatigued.

"Although I have observed hundreds of thousands of persons, among them participants in Red Cross summer institutes, engaged in recreational and instructional swimming immediately after eating, I have yet to see the first case of drowning or near drowning that could be attributed authentically to swimming at this time. Usually drownings are attributable to carelessness or foolhardiness.

"I believe that the excitement connected with competition or the fear of drowning may interfere with digestion much more than the swimming exercise itself. A full stomach does interfere with movements of the diaphragm and thus reduces one's desire and ability to swim vigorously. For this reason one can do better about two hours after a full meal."

It is not enough to reason that for every hour that swimmers are kept out of the water there is one hour less in which persons may drown from one cause or another. Pool time is too valuable in our large schools to warrant an hour or two of shut down after breakfast and after lunch on the basis of unfounded tradition. There is no evidence to warrant the restriction of noncompetitive swimming during the first hour after a meal unless the stomach is so full as to seriously restrict movements of the diaphragm. ★