



Olympic Heat

- July/August 2004

by Richard A. Lovett



As any athlete can tell you, weather plays a critical role in outdoor sports. For those hoping to shatter records, the phrase that's most likely to describe the weather at 2004's Summer Olympic Games in Athens, "hot and sunny," isn't particularly conducive to record-breaking performances. The games take place August 13–29, when Athens has an average high of 89°F, an average 8:00 a.m. temperature of 72°F, and temperatures that could easily climb well into the 90s.

Heat isn't the only type of weather that can affect the Summer Olympics. Rain-soaked shoes make for slow running, wet pavement prompts bicycle crashes, and running into a 20 mph headwind is comparable to running up a 3 percent grade. Many track and field records don't count if they are boosted by a tailwind of greater than 2 meters per second (4.5 mph). Luckily, heavy rain and strong winds are unlikely in Athens. August typically serves up only one day a month with lightning or precipitation greater than 1 millimeter, and the average afternoon wind speed is 11 miles per hour. Nevertheless, storms caused by convective instability are possible, particularly along the confluence zone where afternoon sea breezes meet the morning's prevailing northeast wind. In September 2002, such a storm produced torrential rains that dumped up to 3 inches of rain, with considerable local flooding.

Running Hot

"My wife has family in Greece," said John Bennett, vice president of Atmospheric and Environmental Research, Inc., a Massachusetts firm that will be providing forecasts and warnings at 1 km resolution over the main Olympic areas. "Her sister says that August is the worst time of year for exertion." The afternoon heat will mix with a dew point of about 60°F to produce potentially muggy conditions (about 40 percent relative humidity). "The athletes will notice that," Bennett said. "There's not a lot of cooling potential there."

Conventional wisdom says that such conditions are worse for endurance athletes than for sprinters because sprint races are over before runners can overheat. On hot days, you can expect to see good performances in sprint races and poor ones in distance events. Sprinters may not like hot conditions, but what they really don't like is the cold, when it's easy to pull a muscle. Indeed, cold weather impacted some events at the

2000 Sydney Olympics, held in September. Since Sydney is south of the equator, the events took place in the equivalent of March in the northern hemisphere.

Endurance athletes, on the other hand, are vulnerable to heat. Unless Athens has a perfectly timed cool wave, world records are unlikely in long-distance events.

Looking Back

One sport that is particularly susceptible to weather conditions is rowing. In 1896, the last time the Olympics were held in Athens, inclement weather forced the cancellation of rowing and sailing events. While history texts neglect to say precisely what went wrong, wind or lightning were the most likely culprits. Wind could also play hob with this year's rowing schedule because the rowing venue lies in an unusually breezy location. When the venue was tested, air flowing down from nearby mountains created enough crosswind to capsize some boats, Bennett said.

Athletes obsess about weather, but history books tend to ignore it—so much so, in fact, that guesswork is needed to unravel a dramatic story from the Amsterdam games of 1928. It was the first Olympics in which women were allowed to participate in track and field events. The longest women's event, the 800-meter run, was marred by reports that six of the nine finalists “collapsed” at the finish.

Historian Allen Guttman of Amherst College believes the collapse was overstated. “The women were exhausted,” he said, “just as the men were after their race—and some of them sprawled on the grass to recover. The myth of the collapse was perpetrated by journalists who felt the race shouldn't have been run.”

Myth or not, Olympic officials concluded that women were too weak to compete in long races. It would be another 32 years before they were again allowed to run 800 meters, and it wasn't until 1984 that they gained the right to run in the premier distance event, the marathon.

In large measure, the debacle of 1928 was caused by poor preparation by competitors. But it seems likely that heat also played a role. If so, the weather helped set back women's athletics by nearly 50 years.

Weather played a more certain role in a controversy during the Paris games of 1900. That year's marathon was run over a meandering course, not all of which was paved. It rained the night before the marathon. When the winner, a Frenchman, arrived at the finish with clean legs, the mud-spattered American who found himself in second place argued that his competitor must have taken a shortcut. The Frenchman kept his medal, but the controversy lingers.

Modern Strategies

Exercise physiologist Timothy Noakes of the University of Cape Town, South Africa, predicts that the Athens heat will play an enormous role in some of this year's races. To begin with, he says, no runner weighing more than 60 kilograms (132 pounds) has much chance of winning a medal in the marathon. In the 1996 Atlanta games, where hot weather was also a problem, the men's marathon winner, South African Josiah Thugwane, weighed only 99 pounds. The silver medallist, Bong-Ju Lee, of South Korea, wasn't much heavier. “That will be repeated in Athens,” Noakes said.

Top-level female marathoners are almost always super-petite, so heat may not be as big a deciding factor for the women as for the men. Larger athletes will be at competitive disadvantages in shorter events as well. In a recent laboratory experiment, Noakes tested two groups of men, one weighing 130 pounds and the other weighing 110 pounds. The men ran 8-kilometer time trials on treadmills. In cool temperatures, the two groups were about equal. But when the room temperature was jacked up to 95°F, the smaller men were 45 seconds per mile faster than their larger counterparts. The reason: smaller body size makes it easier to shed heat.

Athletic lore is full of tips for how to handle heat. Acclimatization tops the list. Wise athletes will do much

of their training in conditions similar to the worst they expect to encounter in Athens.

Efforts to stave off the effects of heat by drinking copious quantities of water and sports drinks are controversial. For years, the conventional wisdom has been that dehydration contributes to declining performance in hot weather as well as to the risk of heatstroke. But Noakes argues that the scientific underpinnings of this belief are weak. There is little actual evidence that links dehydration and heatstroke, he said, and excess fluid consumption is itself dangerous.

Other heat-racing strategies involve running beneath water sprays and swabbing your face and neck with wet sponges. The theory is that these strategies assist the body's natural cooling processes. But you have to be careful about the temperature of the water, said Alberto Salazar, who was favored to win the 1984 Olympic Marathon in Los Angeles, where heat was also expected.

Salazar, who had never run well in heat, was so concerned about the weather that he paid a visit to the U.S. Army's Heat Research Institute, where scientists seek the best way to prepare soldiers for desert duty. The Army scientists advised him to dodge the cold-water mists even though they might feel pleasant. "The shock of the cold water can cause your skin to chill, shutting down the sweat pores," Salazar said. "You're still generating heat, but temporarily it can't escape. You wind up more overheated than you were beforehand."

High-tech clothing may help. The best running singlets are constructed of mesh material, which is designed to provide good ventilation while shading the skin from direct exposure to the sun. One running shoe manufacturer boasts that the breathable fabrics of its shoes help let cooler air in and hot air out. And a few years ago, sports giant Nike experimented with a mesh shirt with knobs of fabric on the inside, which allows extra ventilation by holding the fabric a millimeter or two away from the skin.

This year, all the athletes will have their own special methods of attempting to beat the heat. But no amount of high-tech gear is going to change one basic fact: It's going to be hot in Athens.

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