Profile Lewis Gordon Pugh—polar swimmer

James Butcher

Explorers and adventurers throughout history have sought out cold and inhospitable places, desperate to go where no man has gone before. Many of them have attained almost mythical status: Edmund Hillary and Tenzing Norgay’s conquest of Everest; the race between Robert Falcon Scott and Roald Amundsen to reach the South Pole; and Robert Peary’s and Frederick Cook’s disagreement over who made it first to the North Pole.

Lewis Pugh, a 35-year-old British lawyer who grew up in South Africa, is clearly cut from the same mould. On Dec 15, 2005, he will attempt to break the world record for the most southern swim when he plunges into water off the Antarctic Peninsula that is expected to be just below 0°C. He hopes to complete the 1 km swim in around 22 minutes. Pugh already holds the world record for the most northern swim. On Aug 19, 2005, he swam 1 km around Verlegenhuken, the most northern point of Spitsbergen (at 80° north), in 20 minutes and 32 seconds. Verlegenhuken is only 1100 km from the North Pole; the icy water was just 3°C on the day of his swim.

"It was the most impressive performance I’ve ever witnessed in unusual circumstances", says sports physiologist Tim Noakes from the University of Cape Town, South Africa. "What was so impressive was that he was able to put his head under water and swim normally under those conditions", says Noakes. "There aren’t too many people able to do that." Noakes accompanied Pugh in a boat and measured Pugh’s core body temperature throughout the swim; by the end it was somewhere between 36.5 and 37°C. "Lewis’ temperature did not drop as far as we had expected it to when he was swimming", says Noakes. However, his core temperature fell to 35.0 degrees approximately 30 minutes after he finished the swim, when he was in a hot shower. "This is the afterfall that is well recognised as the body starts to heat itself up by perfusing the legs", says Noakes. "As a consequence of perfusing the legs, which are ice cold, the total body temperature falls."

Like all athletes, Pugh had to prepare intensively for his attempt on the world record. For a month he trained in a specially prepared swimming pool that contained ice-cold water measuring as low as 2°C. He made himself swim for 15–20 minutes in the icy pool four times a week. To put that in perspective, a normal heated indoor swimming pool is maintained at 27°C and the English Channel, which most people would consider to be decidedly chilly, is a comparatively tepid 17–18°C.

Channel swimmers can survive for well over 12 hours in such temperatures. However, exposure to Arctic conditions brings its own special challenges. "Few people can survive exposure to ice-cold water for more than a few minutes because of the unique physiological responses invoked by immersion in cold water", explains Noakes. These include a reflex inspiratory gasp followed by a short period of uncontrollable hyperventilation, tachycardia, as well as intense peripheral vasoconstriction.

The rapid breathing, which can reach rates of 60 breaths per minute, increases the likelihood of inspiring water. It also causes a pronounced respiratory alkalosis, which decreases the flow of blood to the brain, causing disorientation. This reflex, called the cold-shock response, is caused by stimulation of cutaneous cold receptors. "When you dive in it’s not even a second before the reflex kicks in", says Pugh. "The important thing is to control your breathing and to use strong firm strokes and just remain calm.”

Michael Tipton and Clare Eglin, physiologists from the University of Portsmouth, UK, have shown that the cold-shock response becomes less pronounced after repeated exposure to cold water in healthy volunteers. Pugh’s training regimen has clearly made him less sensitive to the sudden exposure to cold.

Limb coordination is also difficult to maintain in icy water. Eglin and Tipton demonstrated that swim efficiency decreases in 10°C water; their volunteers swim with shorter, more rapid strokes and tended to adopt a more upright swimming position that increases drag and sinking force. Sharp ice is also a practical problem for Pugh, who says that his limbs were cut during a recent polar training swim. "It’s a hell of a hostile environment to be swimming in", he says. Understandably.

Pugh has done open water swimming for the past 18 years. He swam from Robben Island to Cape Town when he was just 17 years old (see panel). But it is only in the past 2 years that he has started swimming in exceptionally cold parts of the world. In 2004, he swam the entire length of the 204 km long Sognefjord, Norway’s longest fjord, an epic journey that took him 21 days to
Panel: Landmarks in Pugh's swimming career

Aug, 2005  First swim in the Arctic Ocean; breaks his own world record for the most northern swim when he swims 1 km around Verlegenhaken, the most northern point of Spitsbergen (at 80° north)

Aug, 2005  Breaks his own world record for the most northern swim when he swims 1 km in Magdalenefjord in Spitsbergen

Aug, 2004  Swims 204 km down Sognefjord in Norway to break the record for the longest cold-water swim in the world

April, 2004  Becomes the first person to swim around the Cape of Good Hope

April, 2004  Swims 100 km around Cape Peninsula, the longest cape in Africa, to raise funds for HIV/AIDS orphans in South Africa

Aug, 2003  Becomes the first person to swim around the most northern point of Europe—North Cape, Norway (71° north)—and breaks the world record for the most northern swim.

May, 1994  Becomes the first person to swim around Cape Agulhas, the most southern point of Africa, where the Indian and Atlantic Oceans meet

Aug, 1992  Swims the English Channel in 14 h and 50 min

Jan, 1992  Becomes the first person to swim across a Great African Lake (Lake Malawi)

Oct, 1991  Becomes the fastest man to swim around Robben Island, where Nelson Mandela was imprisoned

I see the water, my temperature rockets up to 38°C”, he says. Noakes terms this response “anticipatory thermogenesis”, a Pavlovian response that is the result of years of conditioning. “Before a swim my body becomes like a furnace”, says Pugh. “It realises that I’m going to get cold, and so turns on the burners.” During his recent Arctic swim, Pugh lost 1°C of core body temperature for every 10 minutes that he was in the water, so starting at 38°C helped him complete the swim. A positive mental attitude and an intense determination to succeed also marks him out from the crowd. Despite his quietly spoken demeanour, he is clearly a very driven man.

Pugh’s father, Patterson, was Surgeon Rear Admiral in the Royal Navy, and Lewis was brought up on a diet of adventure stories and feats of endurance. “I remember dreaming of wanting to go to the Arctic or Antarctic as a kid”, he says. “Much like Edmund Hilary wanted to be the first person to climb Everest, I wanted to be the first person to swim in the Arctic Ocean.”

Indeed, Pugh is one of only two swimmers to have ever completed a polar swim. The other, Lynne Cox, swam a mile in the Antarctic in 25 minutes in 2002. “I was fortunate”, says Pugh. “I came to swimming 18 years ago and at that time very few of the world’s famous landmarks had been swum around. Myself and Lynne Cox went around the world and we’ve done the vast majority of them. There’s now almost no significant landmark left to conquer.”

Further reading