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I swim laps at noon several times a week. I enjoy the water, and the gentle exercise is good for my aging joints.

Like other old ladies in the pool, I'm no speed demon. Even a bucketful of performance enhancing drugs would not make me slice through the water quickly. But like all the lap swimmers I know, slow or fast, I take an interest in Michael Phelps and the other American swimmers soon to compete in London in the 2012 Summer Olympics.

Phelps is famous for the eight gold medals he won during the last Olympics in Beijing. Because he accomplishes so much, it's natural to look for special explanations as to why he has dominated his sport. Focusing on some of his physical attributes doesn't, of course, take anything away from the training to which he devotes himself as he prepares for competition. But it may well be that he has some natural advantages that help make him a superb swimmer.

Phelps is not a little fellow. He stands 6 foot 4 inches. He's got broad shoulders and his arms measure 80 inches from fingertip to fingertip – a length greater than his height. That extra-wide "wingspan" is an advantage in swimming, a sport where much depends on arm strength and power. Phelps also has size 14 feet, giving him natural "flippers" that complement his arm movement with a strong kick.

Recently the Science 360 website had a story on the basic challenge all swimmers face: the drag that acts to slow a person's movement through the water. Thrust is the force that pushes a swimmer forward, while drag opposes that movement. For those of us who don't swim quickly, drag isn't really such a problem (gasping for breath is my main challenge in the pool). But for elite swimmers, managing drag is one of the keys to winning races.

There are three kinds of drag that folks like Phelps contend with. First is frictional drag. The water immediately next to Phelps' body moves with him in the forward direction, setting up frictional conflict with the water a bit farther from him that isn't moving like that. Second is what's called pressure drag. In front of Phelps' head is a high pressure zone created by his movement, while around his feet the water is at relatively low pressure. The differences in pressure oppose Phelps' movement through the water. Finally, wave drag refers to the little "bow wave" that forms in front of a fast swimmer's head. To move forward, a swimmer must move up and through that constant waveform.

Elite swimming is all about fine-tuning body movement to minimize drag and maximize thrust. Just as engineers design planes and sports cars to slice through the air quickly and easily, coaches try to help swimmers master the basics of fluid dynamics to zip from one end of the pool to the other.

I'll be holding my breath for Phelps and the other American swimmers, hoping they can bring home a passel of Olympic medals.