



A Stroke of Scientific Genius

By Keith Hanna, *Fluent News*

In many sports, there are differing opinions that surround the underlying physics, biology, and chemistry that are involved. FINA, the governing body for the sport of swimming, sets limits on allowable scientific advances in both training and equipment, like goggles and swimsuits. In addition to the FINA guidelines, the International Olympic Committee (IOC) publishes handbooks every few years interpreting current scientific knowledge related to a given sport.

The IOC publications have ranged from alpine skiing to soccer, from cycling to volleyball, and are viewed as definitive guides. They are designed to help scientists and technologists communicate their knowledge to coaches, physicians, trainers, athletes, and parents of elite athletes, as well as interested members of the general public.

The **Handbook of Sports Medicine and Science: Swimming** edited by Joel M. Stager and David A. Tanner (Blackwell Science, 149pp, 2nd Edition 2005, ISBN 0 632 05914 1), is one such publication that covers the physics, psychology, biomedicine, and training issues associated with swimming. It features two articles by Barry Bixler, a Principle Engineer at

Honeywell Engines & Systems in Arizona, USA, who is a CFD expert and the parent of a competitive swimmer. Bixler is now a recognized authority on the hydrodynamics of swimming and a consultant to Speedo, the elite swimwear brand. He was a prime mover behind the design of the successful Fastskin FSII swimsuit in the Athens 2004 Games.

Bixler's essays on the *Mechanics of Swimming* and *Resistance and Propulsion* in swimming are seminal expositions of detailed scientific explanations of the many physical concepts going on during swimming. He elucidates the latest thinking related to the science of swimming hydrodynamics using CFD illustrations to guide the reader through the subject, and dispels many urban myths related to swimming. He explains colloquial swimming terms in understandable scientific language.

Although Bixler points out that more research is required using CFD and other mathematical modeling techniques before a real-time, realistic, and predictive computational swimming model will be available to coaches and trainers, these essays and the IOC book in general, are a timely and enlightening summary of the science of swimming. ■

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