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Stephen J. Langendorfer

Bowling Green State University, slangen@bgsu.edu

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Science in Swimming V

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Published in 2014 by Wydawnictwo Akademia Wychowania Fizycznego (AWF),
Wroclaw, Poland; 155 pages, ISBN: 978-83-89156-45-7

Reviewed by Stephen J. Langendorfer, PhD, Bowling Green State University

I had the great honor in October 2014 to visit the Akademia Wychowania Fizycznego (AWF) in Wroclaw, Poland, as their guest. During that time, I had the unique opportunity to present a “golden” lecture on water competence and another lecture regarding tips for publishing in the *International Journal of Aquatic Research and Education*. While visiting the Akademia and Wroclaw, I was presented with an autographed copy of the fifth and latest monograph in the *Science in Swimming* series that AWF has produced since 2007. The chapters and papers are drawn from the scholarly presentations made to their spring symposium on aquatics, swimming, and water safety. More importantly, I got to meet many of the authors and editors of the recent monograph face-to-face. It was a wonderful privilege and honor for me to meet them.

In my two previous Media Reviews of earlier monographs (*III* and *IV*) in the *Science in Swimming* series (Langendorfer, 2012, pp. 366–367; Langendorfer, 2013, pp. 407–408), I expressed my general admiration for this ambitious series of publications of scientific swimming studies conducted in Poland. As part of my recent visit, I was able to tour their modest aquatic scientific laboratory adjacent to their extremely busy natatorium. Like their diverse published studies, I was duly impressed by the ingenuity with which this group of Polish aquatic scientists has constructed study-specific equipment to assist with their extensive research and publication efforts. This group of scholars and graduate students at AWF in Wroclaw represents one of the finest and most substantial groups of scientists who are engaged in studying the science of swimming assembled anywhere in the world.

The most recent symposium organized by the University School of Physical Education in Wroclaw and the Society for the Promotion of Science in Physical Education and in Sport in Poland was convened in April 2014. A dozen of the papers presented at that gathering are presented in English within the 155 pages of *Science in Swimming V*. As with the previous volumes, because most of the authors are nonnative English speakers or writers, their works are translated into English and have been ably edited and proofread by several academic reviewers, Professors Tadeusz Bober, Jaroslaw Domaradzki, and Robert Keig Stallman (one of *IJARE*'s Editorial Board members) as well as Agnieszka Piasecka-Ceccato. Once again, I am compelled to express my admiration for the quality of this semiannual undertaking that includes not just the collection, review, and publication of papers, but their skillful translation as well.

This current monograph of *Science in Swimming V* follows the three chapter (section) organization that evolved in the previous volume. Four papers are grouped

in the first chapter, called “Didactics in Swimming”; five papers are in the second chapter, titled “Biology in Swimming”; and the final three papers represent chapter three, “Swimming Performance and Lifesaving.” While not as numerous as the previous monograph with its 20 papers, the quality of each of these papers in the latest monograph is as good as or better than their predecessors. This is a tribute to the authors, editors, and reviewers of this monograph. It also demonstrates the continuing robustness and quality of the scholarly swimming research agenda being supported and conducted in Wrocław.

Didactics in Swimming

Chapter I (62 pages), entitled “Didactics in Swimming,” features four diverse reports focusing on aquatic topics addressed using social sciences or humanities perspectives. For example, Andrzej Pawlucky has composed the first paper, “Sport as a Utopian Competition of Equal Opportunities.” I found this paper to be a fascinating complex work that examines a number of philosophical utopian propositions about performance in gymnastics and swimming. Magdalena Chrobot and Karolina Lozinska authored “The use of visual information in teaching swimming to people of various age” to study how frequently swimming instructors provide dry land and in-water demonstrations for swimmers to copy and whether they use different amounts depending on the age of the learners. The third paper in this section, “Swimming Talent, Level of Aspiration, and Kinesthetic Efficiency,” was authored by the trio of Andrzej Klarowicz, Aleksander Smolinski, and Michal Kedrak. Their study focused on highly skilled swimmers and whether their levels of kinesthetic awareness were related to their goals and aspirations as competitive swimmers. The final paper of this first section, by Anna Kwasna, Stefan Szczepan, and Aleksandra Spirydowicz, focused on the potential role of music on swim training. “The Impact of Preferred Music on Heart Rate, Subjective Perception of Exertion, and Swimming Effectiveness” discovered that self-selected music did not significantly alter heart rate or distance covered on a 12-min swim test, but swimmers did perceive that the music made the swim less effortful.

Biology in Swimming

Chapter II (50 pages), titled “Biology in Swimming,” has five studies and reports that examined swimming from postural, anthropometric, and biomechanical approaches. The first paper by Grzegorz Konieczny, Krystyna Antoniak-Lewandowska, and Daria Rudnik examines the question of how healthful recreational breaststroke may be for persons who suffer from back pain from degenerative intervertebral disc disease. Based on the results of “The Effect of Recreational Breaststroke Swimming on the Posterior Curve of the Lower Spine” using college-age swimmers, it appears that the breaststroke may be an appropriate stroke for those who suffer back pain. The second paper, “The Variability of the Stroke Index (SI) in Swimming for People With Disabilities,” was a study conducted by Wojciech Seidel and Bartosz Bolach to examine how elite swimmers with a disability tolerate increasing levels of fatigue during spring swimming. Using the swimming stroke index as a measure of stroke efficiency indicated that these para-Olympic swimmers did not

significantly change their efficiency over 16 sprint intervals. The authors suggested that the SI could serve an important diagnostic assessment tool. [As a personal note, a simpler type of SI, the arm stroke index (ASI), is one of my favorite swim assessment measures, and I was not surprised that it worked so well for this study.]

As I mentioned in my introduction to this Media Review, I had the opportunity to tour the swimming laboratory at AWF when I was hosted in Wroclaw. One of the innovative devices I saw was the one used in this third study, “Pressure Differentials on Swimmers’ Hands and Swimming Direction,” by Marcin Jaszczak. The device measures how much the pressure on the palm and back of the hand differs during stroking. This study compared breaststroke swimming in a straight line and along a curved line while the participants were blindfolded with their ears plugged. No significant differences were found between the two conditions even though the pressure differentials were different between right and left hands, but it did not appear to cause any lateral veering. A fourth study in this section, “Somatic Construction of Young Swimmers,” by Alicja Stachura, Jakub Karpinski, Wojciech Sadowski, and Ryszard Karpinski employed a large sample ($N = 317$) of 11–15-year-old swimmers to examine potential age- and gender-related differences in body composition and anthropometrics including somatotyping. Not surprisingly, swimmers tend toward combined ectomorphic and mesomorphic somatotypes that differed between boys and girls. The final paper in this section, “The Relationship Between Body Composition and Performance Results in People Engaged in Recreational Swimming,” was composed by Stefan Szczepan, Szymon Berezniccki, Krystyna Zaton, and Anna Kwasna. The authors tested recreational swimmers to see whether body fatness was associated with 25 m sprint time; there was no correlation among women tested and a negative correlation among the men.

Swimming Performance and Lifesaving

Chapter III (42 p.), entitled “Swimming Performance and Lifesaving,” features two papers devoted to competitive swimming performance and a third focused on water park risks. The first paper in this chapter, “Analysis of Swimming Pacing Patterns at the Polish Championship and the European Championship in 2012,” by Jakub Karpinski, Alicja Stachura, Ryszard Karpinski, and Wojciech Sadowski, examined how participants in the 200 m freestyle paced themselves by comparing Polish finalists with the European Championship finalists. Although the Polish swimmers were slower, their pacing patterns were similar to the faster European champions, giving hope to future performances by the Polish middle distance freestylers if they can increase their speed and endurance. The second study, “The Evolution of Performance in the 50, 100, and 200 m Freestyle Events in the Polish Championships and the European Championships Between 1922 and 2012,” by Ewa Dybinska, Maciej Usidus, and Katarzyna Kucia-Czyszczonek, did an interesting historical examination of how competitive performances in the sprint freestyle events have improved over the past 90 years. It was not surprising to me that the European champion times were faster than the Polish times (it would be that way for all individual countries), but it was interesting that the Polish women swimmers seem to have improved relatively more than the Polish men.

The final study in the third section focused on water safety and lifesaving using a survey methodology. Wiesner Wojciech authored “Identification of Risks

in Water Parks: A Survey of Customers and Lifeguards.” As the editor of *IJARE*, I am familiar with other work by Professor Wojciech who chairs the Recreation program at AWF. This is another important study that examined how lifeguards and water park users of a water park in Wroclaw viewed the inherent risks of accidents associated with some of the newer elements such as induced waves and slides. Lifeguards viewed the elements as being much riskier than did the park users. The outcomes promise to influence how lifeguard training ought to be modified to assure that more dangerous elements are more closely supervised.

As I mentioned in my introduction, the fifth volume of *Science in Swimming* was an autographed personal gift from faculty and students of the AWF for which I feel honored to have received. Despite that fact, I can honestly say I continue to be extremely impressed with both this specific volume as well as the entire *Science in Swimming* series. The works come primarily from the faculty and students of AWF in Wroclaw, but not exclusively. Several studies were conducted by authors from the Department of Swimming and Rescue in Katowice and the Sport Institute in Krakow.

I believe that this fact about the broad base of studies reinforces my ongoing opinion that the science of swimming sport in Poland is robust, rigorous, and vibrant. I am certain that such strong evidence-based publications can only improve the quality of learn-to-swim, competitive swimming, water safety, and drowning prevention in all of Poland. It also provides a terrific practical and scientific model for the study of aquatics that I think many more countries, including the United States, ought to follow as a way to maintain low drowning rates and high swimming rates among the general populace of a country. I have been invited by Professor Zaton to attend the next symposium in 2016. I confess to already being excited about the prospect of returning to Wroclaw to participate. I already am considering what personal research to conduct to present it at the 2016 symposium!