Journal of Sports & Entertainment Law
HARVARD LAW SCHOOL

Swimming's Flip Turn: New Technology Regulation in Sports

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Abstract

Sports governing bodies ("SGBs") are responsible for regulating technology in their sport(s). The decision to allow a new technology can profoundly alter both the experience of participating in a sport and, ultimately, the legitimacy of the competition itself. From 2000 to 2009, swimming underwent a rapid transformation as high-tech, performance-enhancing swimsuits proliferated without meaningful regulation by FINA, swimming's SGB. By 2008–09, swimming was in crisis, with world records falling at unprecedent levels and swimsuits determining outcomes disproportionately to athletes' abilities. On January 1, 2010, FINA partially banned these suits but left its record book untouched. This Article uses swimming as a case study to understand how SGBs can better approach new technology regulation. The Article concludes that SGBs' decisions to allow new technologies must be tied to a vision for the future of their sport(s).

Introduction

There is no baseball without a bat, no hockey without skates, and no tennis without a court. The use of technology[1] is integral to sports competition,

* Associate, Hogan Lovells US LLP. Thanks to Prof. Carfagna for his mentorship and his stewardship of the HLS sports law community; to each and every editor who generously gave their time and thoughts; and, most of all, to my partner Sam for her encouragement and ceaseless support.

[1] The use of technology is inescapable in sports. For the purposes of this Article, "technology" is defined as anything used in competition that is created by humans and which does not already exist in the natural world. For example,

and changes to sports technology have the potential to reshape sports themselves. In the 2000s, swimming underwent a metamorphosis as the Fédération internationale de natation ("FINA")[2] authorized a novel technology: the full-body tech suit. Instead of regulating these competition swimsuits, FINA allowed them to become increasingly performance-enhancing over a decade-long period. In 2009, FINA ultimately responded to global outrage at the state of the sport by partially banning these suits and establishing a new regulatory regime for competition swimwear.

Through the lens of FINA's management of tech suits, this Article seeks to understand how sports governing bodies ("SGBs")[3] can better regulate new

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open-water swimming events take place in rivers, lakes, oceans, or water channels, World Aquatics, *Competition Reguls.* pt. 3 art. 1.1 (2025), https://resources.fina.org/fina/document/2025/07/01/ed3110a4-2291-411d-8526-6f641bd9237a/Competition-Regulations_June-2025_Clean-updated-01.07.2025-.pdf and [https://perma.cc/2KX7-VP2T], whereas traditional swim meets typically occur in pools; in this facet of the respective sports, open-water swimming does not rely on technology while traditional swimming does (i.e., pools are technology while open water bodies are not). This definition of "technology" primarily includes athletes' apparel, athletes' and officials' equipment, and the competition environment, such as playing surfaces and facilities. Every sport makes use of technology to varying degrees; to draw from the same example, consider the use of wetsuits or goggles in open-water swimming.

[2] FINA was the international governing body for swimming. In December 2022, FINA adopted a new name: World Aquatics ("W.A."). *See FINA Becomes World Aquatics as New Brand Launched*, World Aquatics (Dec. 12, 2022, 09:25), https://www.worldaquatics.com/news/2979029/fina-becomes-world-aquatics-as-new-brand-launched [https://perma.cc/JN78-VAM8]. The organization is referred to by the temporally appropriate name in this Article.

[3] SGBs are non-profit, non-governmental organizations responsible for the development, regulation, and promotion of a single sport or set of sports. They include international sports federations (e.g., W.A.), which administer sports on a global level, and national governing bodies (e.g., USA Swimming), which must comply with rules set by their respective international sports federation and administer sports on a national level. *See, e.g.*, Jörg Krieger, Lindsay Parks Pieper & Ian Ritchie, *International Federations and National Governing Bodies: The Historical Development of Institutional Policies in Response to Challenging Issues in Sport*, 51 Sport Hist. Rev. 1, 1–3 (2020). Both international sports federations and national governing bodies regulate technology in their sports, albeit on global versus national scopes. *See, e.g.*, Karen Crouse, *Swimming Bans High-Tech Suits, Ending an Era*, N.Y. Times (July 24, 2009), https://www.nytimes.com/2009/07/25/sports/25swim.html [https://perma.cc/PV4P-H5QC] (discussing FINA enacting global regulation on swimwear); *FINA Approved Tech Suits Approved for 12 Under Use*, USA Swimming (Aug. 25, 2020), https://www.usaswimming.org/docs/default-source/rules-regulations/tech-suit-restrictions/12-under-approved-suits-2-18-21.pdf [https://perma.cc/EE7K-HNY3] (containing USA Swimming's list of approved competition swimwear for athletes

technology in their sport(s). The ideal model for the regulation of new technology in sport has yet to be determined, likely because there is no "ideal" model—what is best for a sport may boil down to what the decision-maker subjectively believes is best. However, the FINA full-body tech suit case study provides a unique example of an SGB under-regulating new technology in its sport, from which lessons can be drawn to inform an improved model of new technology regulation.

This analysis develops in four Parts. Part I contextualizes technology's role in sports and why new technology regulation is a crucial function of SGBs. Part II provides a history on the development of tech suits, the effect of tech suits on swimming, and how FINA responded to their proliferation in the sport. Part III discusses how new technology regulation impacts a variety of factors, such as fairness and public interest, and how these factors manifest in swimming. Part IV then analyzes how FINA's ban on full-body tech suits in 2009 impacted the factors mentioned in Part III. This Article concludes that SGBs can better regulate new technology by developing a long-term vision for the future of their sport and tying this into their new technology regulation strategy.

I. Technology's Role in Sports

A. Technological Doping

Any change in a sport's technology alters the sport itself. When these changes are minimal, the differences may be imperceptible to even top athletes, but drastic alterations can cause the sport to no longer resemble its previous form. An illustrative example of technology's potential to reshape a sport is pole vaulting. The gold-medalist pole vaulter at the first Olympic Games in 1896 used a wooden pole to leap 3.30 meters.[4] When metal poles were first introduced in 1950, the world record immediately shot up by a half

ages twelve and under, following a 2020 ban that limited competition swimwear for athletes in this age group to inexpensive suits). Although professional sports leagues are not SGBs (for a variety of reasons, but chiefly because their goal is to profit and not solely to govern a sport), they deal with similar issues as SGBs vis-à-vis technology regulation.

[4] *See* Jon Bardin, *Is Technological Doping the Strongest Force in the Olympics?*, L.A. Times (July 24, 2012, 00:00 PT), https://www.latimes.com/science/la-xpm-2012-jul-24-la-sci-sn-is-technological-doping-the-strongest-force-in-the-olympics-20120724-story.html [https://perma.cc/UQT8-FPL4].

meter.[5] With no rules limiting pole materials,[6] the introduction of glass and carbon fiber poles helped the most recent gold medalist, and current men's world record-holder, reach 6.30 meters.[7] How the first and most recent gold medalists would have measured up against each other, or even if they truly participated in the same sport, is wholly unclear.

The use of new technology in sports also creates concerns over legitimacy. Sports rely on the premise of fair competition to be considered legitimate and, accordingly, are governed by rules that promote this end.[8] Yet athletes are incentivized to use all tools available to them to improve their performance or competitiveness, and some athletes will inevitably cheat to gain an advantage.[9] The most obvious example of cheating is the use of performance-enhancing drugs ("PEDs"), a practice long prohibited by SGBs.[10]

When athletes use technology to improve their competitiveness, though, the boundary for what is acceptable becomes murkier. On one end of the spectrum is "technological doping"—the concept that the use of certain technologies should be banned because they corrupt a sport in a manner similar to PEDs.[11] Oscar Pistorius, a double-amputee known as the "Blade Runner" for the prosthetics he wore when competing in track events, was accused of technological doping when he participated in the 2012 Olympic Games.[12] In the following years, academic debate raged over whether his prosthetics gave

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[5] *Id.*

[6] *Id.*

[7] The record of 6.30 meters was set on September 15, 2025, by Armand Duplantis. *See Pole Vault*, World Athletics, https://worldathletics.org/records/by-discipline/jumps/pole-vault/outdoor/men [https://perma.cc/T7Z3-REF3] (last visited Oct. 14, 2025).

[8] *See generally* Robert L. Simon, Cesar R. Torres & Peter F. Hager, Fair Play: The Ethics of Sport (4th ed. 2018).

[9] *See generally* Erin E. Floyd, *The Modern Athlete: Natural Athletic Ability or Technology at Its Best*, 9 Jeffrey S. Moorad Sports L.J. 155 (2002) (discussing how sports have become infused with technology and noting athletes' incentives to use technology to their benefit).

[10] *See, e.g.*, Robert Alexandru Vlad, Gabriel Hancu, Gabriel Cosmin Popescu & Ioana Andreea Lungu, *Doping in Sports, a Never-Ending Story?*, 8 Advanced Pharm. Bull. 529, 530 (2018) (noting the first instance of PED regulation at the Olympics occurred at the 1972 Games).

[11] *See, e.g.*, Sarah J. Wild, *On Equal Footing: Does Accommodating Athletes with Disabilities Destroy the Competitive Playing Field or Level it?*, 37 Pepp. L. Rev. 1347, 1364 (2010) (discussing how innovation in sports can be perceived as an ethical threat).

[12] *See* Sieg Lindstrom, *Oscar Pistorius*, Britannica (Sep. 16, 2024), https://www.britannica.com/biography/Oscar-Pistorius [https://perma.cc/Y9J6-FJFF].

him an unfair advantage over his able-bodied competitors.[13] On the other end of the spectrum are a multitude of examples involving the use of technology that is widely considered fair and which every high-level athlete can choose to use, such as sprinting in spikes or wearing a mouthguard in contact sports. The use of technology in a sporting context is not inherently nefarious and, in most instances, is considered reasonable.

Even among technologies that plainly seem legitimate, accusations of technological doping arise. For example, there is no debate on whether marathon runners should be allowed to compete in running shoes. Yet, beginning in 2016, the "Battle of the Super Shoe" erupted between shoe manufacturers when Nike unveiled its "Vaporfly 4%" shoe, named as such because it purported to improve running efficiency by four percent.[14] Critics of "super shoes" alleged that athletes sponsored by the manufacturer of the best super shoe—and, thus, who could wear that shoe in races—possessed an unfair advantage over runners who were unable to wear the same shoe because they were sponsored by a different manufacturer.[15]

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[13] The debate concerning Pistorius focused chiefly on whether his prosthetic legs' performance was superior to that of typical human limbs. *See, e.g.*, D. A. Baker, *The "Second Place" Problem: Assistive Technology in Sports and (Re) Constructing Normal*, 22 Sci. Eng. Ethics 93 (2016); Gregor Wohlbring, *Paralympians Outperforming Olympians: An Increasing Challenge for Olympism and the Paralympic and Olympic Movement*, 6 Sports Ethics Phil. 251 (2012); Anne Marcellini, Sylvain Ferez, Damien Issanchou, Eric De Léséleuc & Mike McNamee, *Challenging Human and Sporting Boundaries: The case of Oscar Pistorius*, 1 Performance Enhancement & Health 3 (2012).

[14] *See* Shaun Creighton & Kumudu Ramasundara, *Sports Technology, Law and Regulation - The Battle of the Super Shoe*, Lexology (Sept. 27, 2023), https://www.lexology.com/ (subscription required). Super shoes have characteristically thick soles. *See id.*

[15] *See* Michael Martin, *Nike Vaporfly Shoes Controversy*, NPR (Feb. 23, 2020, 17:11 ET), https://www.npr.org/2020/02/23/808681604/nike-vaporfly-shoes-controversy [https://perma.cc/S2ZL-GLX4]; Linda Geddes, *Did Tigist Assefa's 'Super Shoes' Make Her a Record-Breaking Marathon Winner?*, Guardian (Sept. 25, 2023, 12:41 ET), https://www.theguardian.com/world/2023/sep/25/tigist-assefa-super-shoes-record-breaking-marathon-winner-ethiopian-berlin [https://perma.cc/5CSJ-F6XH]. There is significant evidence that super shoes improve runners' performance. Of note, since the outset of the "Battle of the Super Shoe" in 2016, both the men's and women's marathon world records have not only improved precipitously (the women's record improved by three minutes and thirty-two seconds and the men's by two minutes and twenty-two seconds), but the men's rate of improvement also increased from the previous decade (from 2006 to 2016, there was no improvement in the women's world record, while the men's record improved by one minute and twenty-nine seconds). *See World Record Progression of Marathon*, World Athletics, https://worldathletics.

Controversies centered on technological doping arise out of a perceived failure by SGBs to adequately regulate technology in their sport. SGBs are responsible for determining what technology is allowed in competition, and their decisions can have a profound impact on their sport and their athletes. If Major League Baseball, for example, were to allow composite bats instead of exclusively wood bats, offensive production would increase so significantly that record books would be rewritten.[16] Due to the potential magnitude of the impact resulting from a change in a sport's technology, how SGBs make decisions about technology in their sport is critically important to the sport's legitimacy and, ultimately, its future.

B. The Value of the FINA Case Study

For the purposes of better understanding optimal new technology regulation by SGBs, the tech suit controversy is a particularly instructive case study for three reasons. First, swimming is a competition in a high-drag environment. A human body moving through water experiences approximately 780 times more drag than it does moving through air.[17] This inefficiency means the impact of new technology in swimming can be larger than in other sports;[18] in this regard, full-body tech suits were indeed monumentally impactful. Accordingly, the decisions made by FINA concerning full-body tech suits were exceptionally consequential to the sport of swimming.

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org/records/by-progression/17427 [https://perma.cc/D5AB-B6ER] (last visited Oct. 26, 2024); *Women's World Record*, Marathon Shoe History, https://www.marathonshoehistory.com/womens-world-record/ [https://perma.cc/CLV9-S7YP] (last visited Oct. 26, 2024). In the absence of performance-enhancing technology, one would expect to see the rate of improvement decrease, rather than increase, as runners near the fastest marathon possible by a human.

[16] *Why Do MLB Players Use Wood Bats*, Bat Digest (May 2, 2023), https://www.batdigest.com/blog/why-do-mlb-players-use-wooded-bats/ [https://perma.cc/WEQ5-DXEF].

[17] John D. Barrow, *Why Ban Full-Body Olympics Swimsuits? A Scientist Explains Polyurethane*, Daily Beast (July 25, 2012, 04:45 ET), https://www.thedailybeast.com/why-ban-full-body-olympics-swimsuits-a-scientist-explains-polyurethane [https://perma.cc/LJL8-Z7PK].

[18] Ross Tucker & Jonathan Dugas, *The Battle of the Suits Continues in Rome: Swim Suit Analysis*, Sci. Sport (July 29, 2009), https://web.archive.org/web/20120502070203/http://www.sportsscientists.com/2009/07/swimming-world-records-not-good-day-for.html [https://perma.cc/UHT8-NK8Z].

Second and relatedly, FINA's decisions were also high-stakes in that swimming's legitimacy relies on its authenticity. Swimming is traditionally viewed as a 'pure' sport where technology is an afterthought.[19] Competition in swimming occurs on two levels simultaneously: athletes compete against both each other and the record book. Their performance is attributed to their natural characteristics, not to the technology involved. While this view ignores a variety of ways technology has permeated swimming, such as wake-reducing pool gutters and water temperature control systems, the introduction of tech suits nevertheless profoundly altered the perception of the sport of swimming.[20] A particular technology both became necessary for all elite competitors to use and, eventually, called into question whether they were competing in 'swimming' at all.[21]

Lastly, FINA's handling of the tech suit issue stands alone. SGBs typically abide by their decision to allow a new technology. FINA, on the other hand, first allowed tech suits in 1999, permitted manufacturers to engage in essentially unregulated innovation for ten years, and then reversed course by partially banning the suits (as discussed in much greater depth in Part II). This unique—and, arguably, turbulent—approach allows for greater insight into how SGBs' regulatory decisions impact their sports.

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[19] Brent Rushall, *A Serious Threat to the Very Nature of Competitive Swimming or Not?*, Am. Swim Coaches Ass'n Online (Dec. 19, 1999), https://web.archive.org/web/20111010194047/http://www.swimmingcoach.org/articles/200002/20002_1.htm [https://perma.cc/W3KV-U8UB] (discussing the concept of "swimming as a pure sport."); Tara Magdalinski, Sport, Tech. and Body 111 (2009) ("[S]wimming appears to be an 'authentic' sport that simply requires athletes to churn through the water, pitting their bodies against nature's elements. Traditionally immune from the technological advances and attendant controversies that have plagued other elite sports such as cycling and athletics, swimming has instead offered a forum where performance seems to be a pure 'human v water contest' . . . .").

[20] Magdalinski, *supra* note 19, at 111.

[21] Michael Cowley, *Frustrated Phelps Threatens Boycott Over Suits,* Sydney Morning Herald (July 29, 2009, 18:01), https://www.smh.com.au/sport/frustrated-phelps-threatens-boycott-over-suits-20090729-gdtnqt.html [https://perma.cc/TA8W-9DS9] (quoting Michael Phelps: "The one thing that has really, really changed over the last few years has been the technology in the sport. It's changed the sport completely. [N]ow it's not swimming. The headlines are always who is wearing what suit. It's not swimming and I'm looking forward to the day when we can call our sport swimming again."); *see generally* Mitchell N. Berman & Richard D. Friedman, The Jurisprudence of Sports 23–38 (2021) (introducing the idea that sports have essences and changing something in a sport could possibly change its essence).

II. Swimming History: 1896–2010

A. The Fastskin

At the 1896 Olympics, swimming events took place in the Mediterranean.[22] The sport has evolved ever since, and swimwear with it. From early heavy woolen suits that ran from the shoulders to the knees emerged lighter, more efficient silk and cotton suits.[23] In 1928, the company that would become Speedo introduced the first-ever competition suit, which incorporated an open "Racerback" style with open shoulders and an exposed back to allow for greater range of motion in the water.[24] Over time, Speedo's brand became synonymous with industry-leading innovation in swimming—again transforming the sport in 1957 by introducing nylon suits.[25]

By the 1990s, the prevailing swimsuit philosophy had become 'less is more.'[26] Male swimmers at the 1996 Barcelona Games competed in minimalist briefs,[27] their rationale being that suit fabric created more drag than skin.[28]

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[22] *Swimming at the 1896 Summer Olympics*, Olympedia, https://www.olympedia.org/editions/1/sports/SWM [https://perma.cc/R8RH-VLFP] (last visited Oct. 26, 2024).

[23] Alfonso Trinidad Morales, Javier Antonio Tamayo Fajardo & Higinio González-García, *High-Speed Swimsuits and Their Historical Development in Competitive Swimming*, Frontiers in Psych. 1,1 (2019); *see also Swimsuits Through the Ages*, Guardian *(July 29, 2009, 08:33 ET),* https://www.theguardian.com/sport/gallery/2009/jul/29/swim-suits-supersuits-history-michael-phelps [https://perma.cc/KR6L-9MWA]; Jacob Roberts, *Winning Skin*, Distillations Mag. (Feb. 9, 2017), https://www.sciencehistory.org/stories/magazine/winning-skin/ *[*https://perma. cc/ZKA6-MR6C].

[24] David Meyer, *The Need for Speed: How High-Technology Swimsuits Changed the Sport of Swimming*, SwimSwam (last visited Oct. 26, 2024), https://swimswam.com/wp-content/uploads/2013/06/The-Need-for-Speed-How-High-Technology-Swimsuits-Changed-the-Sport-of-Swimming.pdf [https://perma.cc/98RJ-M7P2]; *see* Julia Day, *The Speedo Story*, Guardian (Feb. 26, 2001, 12:39 ET), https://www.theguardian.com/media/2001/feb/26/marketingandpr.comment [https://perma.cc/K92A-XM3D].

[25] Day, *supra* note 24; Jenny Johnson, *How to Engineer a Record-Breaking Swimsuit*, Illumin Mag. (Oct. 24, 2022), https://illumin.usc.edu/how-to-engineer-a-record-breaking-swimsuit/ [https://perma.cc/9E2X-E6W5].

[26] Jennifer Craik, *The Fastskin Revolution: From Human Fish to Swimming Androids*, 3 Culture Unbound: J. Current Cultural Rsch. 71, 78 (2011) ("American swimmer, Jenny Thompson, observed: 'People thought that the less material the better, the skimpier the swimsuit the faster.'").

[27] Briefs are perhaps more commonly known as 'speedos' but 'briefs' are used herein to avoid confusion between the brand Speedo and the genericized suit shape 'speedo.'

[28] Craik, *supra* note 26; Roberts, *supra* note 23. For additional context, swimmers both at that time and to this day shave most of their skin to reduce drag. This is an

Yet, in November 1999, that philosophy was turned on its head as FINA approved Speedo's revolutionary tech suit, aptly named the "Fastskin."[29]

The appearance of swimming as a sport radically changed between the 1996 Barcelona and 2000 Sydney Olympic Games. *Out* were briefs and the idea that skin was faster than fabric, and *in* was an extremely tight-fitting,[30] full-body suit with various drag-reduction mechanisms, including shark skin-inspired textile and muscle compression (which also decreased muscle fatigue and assisted swimmers in maintaining a streamlined position in the water).[31] As eight-time gold-medalist Jenny Thompson described in 2000:

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effective means of drag reduction, so the 1990s swimmers' belief was well-founded. *See generally* Rick L. Sharp, Anthony C. Hackney, Sheila M. Cain & Richard J. Ness, *The Effect of Shaving Body Hair on the Physiological Cost of Freestyle Swimming*, 4 J. Swimming Rsch. 9 (1988).

[29] Arguably, the first tech suit was Speedo's S2000, which launched in 1992. Speedo followed up the S2000 with the Aquablade in 1996. Both incorporated technologies that purported to reduce drag. However, scholars generally agree that the Fastskin represented the real revolution in competition swimwear as the Fastskin was the first suit that was faster than human skin. *See, e.g.*, Craik, *supra* note 26 at 73; Roberts, *supra* note 23; Magdalinski, *supra* note 19, at 111–12.

[30] For context, swimmers would typically wear a full-body suit that was two sizes smaller than their usual size to maximize the suits' compressive benefits. Craik, *supra* note 26 at 73. These suits would also frequently tear. *Id.* For athletes, full-body compression was highly uncomfortable and the experience of wearing these suits was miserable. *See infra* notes 57 and 58.

[31] *20 Years of Speedo Fastskin*, SwimSwam (Dec. 7, 2020), https://swimswam.com/20-years-of-speedo-fastskin/ [https://perma.cc/6SNS-P94A]; Magdalinski, *supra* note 19, at 115. Interestingly, the science of exactly how and the degree to which tech suits help swimming performance has yet to be fully answered. *See* Morales, Fajardo & González-García, *supra* note 23. Although the Fastskin's shark skin-inspired fabric was extensively marketed by Speedo, later studies showed it to provide negligible drag reduction. Peter Reuell, *A Swimsuit Like Shark Skin? Not so Fast*, Harv. Gazette (Feb. 9, 2012), https://news.harvard.edu/gazette/story/2012/02/a-swimsuit-like-shark-skin-not-so-fast/ [https://perma.cc/7DN7-JUNU]. For the purposes of this Article, it is safe to assume that tech suits provided significant performance benefits to their wearers such that elite competitors had to wear a tech suit to be competitive. *See, e.g.*, Patricia Zettler, *Is it Cheating to Use Cheetahs?: The Implications of Technologically Innovative Prostheses for Sports Values and Rules*, 27 B.U. Int'l L.J. 367, 378–80 (2009); Morales, Fajardo & González-García, *supra* note 23; Jean-Claude Chatard & Barry Wilson, *Effect of Fastskin Suits on Performance, Drag, and Energy Cost of Swimming*, 40 Med. & Sci. Sports & Exercise 1149 (2008); Vladimir Issurin, Vitali Pushkar-Verbitsky & Oleg Verbitsky, *Effect of High-Tech Swimsuits on the Swimming Performance in Top-Level Swimmers*, 54 J. Sports Med. & Physical Fitness 383 (2014); Leon Foster, David James & Steve Haake, *Influence of Full Body Swimsuits on Competitive Performance*, 34 Procedia Eng'g 712 (2012); *cf.* Ray Stefani, *Olympic Swimming Gold: The Suit or the Swimmer in the Suit?*, 9

"Now because the material is so fast, it's the more material the better."[32] At the 2000 Sydney Olympics, Fastskin-wearers won eighty-three percent of all swimming medals and set thirteen out of the fifteen world records broken.[33] The era of the tech suit had begun.

FINA's decision to approve the Fastskin in 1999 was rife with controversy, primarily along two lines. First, some argued that the Fastskin violated FINA Rule 10.7, which stated: "*No swimmer shall be permitted to use or wear any device that may aid his speed, buoyancy or endurance during a competition (such as webbed gloves, fins, etc). Goggles may be worn.*"[34] These critics claimed that the Fastskin was a performance-enhancing "device" under Rule 10.7 and should be banned.[35] The Australian Olympic Commission ultimately filed an appeal in 2000 with the Court of Arbitration for Sport ("CAS") to overturn FINA's approval of the Fastskin.[36] This appeal failed, however, with the CAS arbitrator ruling that FINA's approval of the Fastskin was binding and that CAS lacked jurisdiction over FINA's decision.[37] With that said, calling FINA's decision an "approval" facially gave it more weight than it deserved; in fact, FINA itself acknowledged "there is no specific rule regulating [competition swimsuits]" and that the Fastskin was approved simply because it violated no other FINA rules (presumably because a suit was not a "device").[38]

Many of the critics who argued the Fastskin violated Rule 10.7 are better understood as swimming purists. Their belief that the Fastskin was a step too far in swimming equipment underpinned their quest to have the Fastskin

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Significance 13 (2012) (arguing that "high-tech suits actually had little significant impact on improved swimming performances").

[32] Craik, *supra* note 26, at 78; *see also* Roberts, *supra* note 23 ("The more skin covered, Speedo's logic went, the faster a swimmer would be.").

[33] *20 Years of Speedo Fastskin*, *supra* note 31; Roberts, *supra* note 23. Swimming world records mentioned herein refer to those set in fifty-meter pools, also known as Olympic size pools.

[34] Austl. Olympic Comm., Advisory Opinion CAS 2000/C/267, Court of Arbitration for Sport, ¶ 22 (May 1, 2000), https://jurisprudence.tas-cas.org/Shared%20Documents/267.pdf [https://perma.cc/5H3Z-HZAW].

[35] *See, e.g.*, Rushall, *supra* note 19.

[36] Lisa Dillman, *As Swim Records Fall, High-Tech Suit Faces Scrutiny*, L.A. Times (Mar. 27, 2008, 07:00 PT), https://www.latimes.com/archives/la-xpm-2008-mar-27-sp-swim27-story.html [https://perma.cc/5KDR-L7DX]; Austl. Olympic Comm., *supra* note 34.

[37] *See* Austl. Olympic Comm., *supra* note 34, ¶¶ 25–70. CAS could only have jurisdiction if the arbitrator found that FINA's decision was unreasonable, but the arbitrator held that FINA "acted within the limits (i.e. did not act unreasonably) of the rules." *Id.* ¶ 67.

[38] *Id.* ¶ 21.

banned. They argued that the suit was doing a significant part of the effort of racing and would determine the outcome more than competitors' natural differences, giving swimming essentially a Formula 1 model.[39] By 2000, swimming had adopted a variety of technical innovations that distanced the sport from its 1896 version, including lane lines and goggles. To purist critics, these technologies were a non-issue, however, as they existed to fairness's benefit rather than its detriment.[40] For example, when anti-wave lane lines entered the sport, they reduced water turbulence between lanes such that swimmers' performances were less affected by who they swam next to.[41] Goggles, meanwhile, increased eye safety.[42] Both lane lines and goggles more so reduced externalities affecting swimmers' performance, rather than serving as performance enhancers. To purists, the Fastskin and tech suits like it were technologies that significantly determined the competitive outcome and, as such, were harmful to the sport by reducing athletes' reliance on factors inherent to each competitor.[43]

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[39] Tucker & Dugas, *supra* note 18; Ross Tucker & Jonathan Dugas, *Swimming's Technology Debate as the Ban Approaches*, Sci. Sport (Dec. 30, 2009), https://scienceofsport.blogspot.com/2009/12/ [https://perma.cc/GP6K-GFZZ]. Formula 1 involves a racing competition pairing engineers and drivers; engineers seek to build the fastest car for their drivers. Drivers' cars are not built equally, and cars' engineering is often determinative of drivers' performance. Unlike in swimming, however, Formula 1 has two championships: (i) the Drivers' Championship, which awards the top driver, and (ii) the Constructors' Championship, which awards the top team and, thus, the top engineers. *The Beginner's Guide to the F1 Drivers' Championship*, F1 (2025), https://www.formula1.com/en/latest/article/the-beginners-guide-to-the-f1-drivers-championship.53MjXJzTDxQnfxfoCLnxNZ [https://perma.cc/9GLD-ECCY]; *The Beginner's Guide to the F1 Constructors' Championship*, F1 (2025), https://www.formula1.com/en/latest/article/the-beginners-guide-to-the-f1-constructors-championship.66nTfWSqrUYv3bnbosPkHV [https://perma.cc/GH3V-D8QZ]. Swimming solely has a Drivers' Championship equivalent, and the engineering component is unrecognized.

[40] *See* Rushall, *supra* note 19.

[41] Ross Tucker & Jonathan Dugas, *Two Points of View, as the Swimsuit Debate Continues*, Sci. Sport (July 30, 2009), https://web.archive.org/web/20120502070210/http://www.sportsscientists.com/2009/07/swimsuit-debate-differing-perspectives.html [https://perma.cc/3J7E-NLNB] (quoting John Leonard, then-Executive Director of the American Swimming Coaches Association: "[L]ane lines "maximize" the opportunity of the athlete to swim fast, with minimum turbulence in the lane. [Y]ou should have seen the waves in the pool back in the 60's and 70's[.]").

[42] Zeke Rozell, *Is it Bad to Open Your Eyes in the Pool?*, All About Vision (Jan. 10, 2023) (rev'd by Dr. Sonia Kelley, OD, MS), https://www.allaboutvision.com/conditions/swimmers-eye/ [https://perma.cc/XZ5J-Q64E].

[43] *See* Tucker & Dugas, *supra* note 41; Rushall, *supra* note 19.

A second line of criticism of FINA's decision focused on the unfairness of the Fastskin due to a lack of availability. Speedo first began testing the Fastskin in 1999 with a small group of elite swimmers from Speedo-sponsored national teams who were provided customized Fastskins.[44] At the time of FINA's approval, the Fastskin was not available to most competitors who sought it.[45] To be sure, elite competitors wanted the Fastskin because of its performance benefits and were relatively unconcerned with the purists' objections,[46] but they were simply unable to obtain the suit; in turn, this created a situation where some elite swimmers had a marked advantage over others. USA Swimming even initially banned the Fastskin at its 2000 National Trials out of fairness concerns.[47] By the 2000 Olympics, however, the fairness controversy had died down as most competitors from dominant (and Speedo-sponsored) swimming nations like the United States and Australia were provided with customized Fastskins.[48] The Fastskin and similar full-body tech suits had become normalized.[49]

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[44] Tara Magdalinski, *Performance Technologies: Drugs and Fastskin at the Sydney 2000 Olympics*, 97 Media Int'l Austl. Incorporating Culture & Pol'y 59, 66 (2000) ("[Australian National Team members were] upset that not all swimmers were provided with Fastskin, as Speedo, a major sponsor of the Australian Swimming Team, revealed the suits when they were still being tested. During this phase, only a handful of Speedo-sponsored elite swimmers were provided with custom-designed bodysuits to assist in their development.").

[45] *Id.* at 66 ("[T]he issue of 'fairness' was more about production, delivery and exclusive sponsorship arrangements."); Magdalinski, *supra* note 19, at 112 ("[W]hen open access to customised suits was in doubt, only then were many alarmed at the possible violation of sport's 'level playing field.'"); Rushall, *supra* note 19 (published on December 19, 1999 and writing that "[it] has been reported that there are only eight Speedo suits constructed to date.").

[46] Magdalinski, *supra* note 19, at 112 ("Swimmers were certainly keen to obtain these suits in order to secure an edge over their competitors[.]"); Craik, *supra* note 26, at 72 ("Swimmers largely embraced the suits as enhancing their performances and transforming the sport of swimming: 'You feel so streamlined through the water. It's like you're cutting through the water like a hot knife through butter,' [Grant] Hackett said. 'This suit is a real advancement and evolution for the sport[.]'").

[47] Magdalinski, *supra* note 19, at 112.

[48] Speedo did not offer customized Fastskins to non-Speedo-sponsored countries and athletes, who were offered only generic, non-customized Fastskins. Roberts, *supra* note 23; *see* Magdalinski, *supra* note 44, at 59.

[49] Magdalinski, *supra* note 45, at 59.

B. The "Rocket" Launch

Following the introduction of the Fastskin in 1999, competition swimsuit innovation stagnated until 2008. Although Speedo unveiled the Fastskin II prior to the 2004 Athens Olympics and the Fastskin Pro in 2007, both failed to offer significant performance benefits over the original Fastskin.[50] Speedo, undeterred and ever the pioneering innovator, thus embarked on a three-year project to make the Fastskin line obsolete.[51]

On February 12, 2008, Speedo's project came to fruition as it unveiled the LZR Racer ("LZR").[52] Co-designed by NASA,[53] Speedo boldly marketed the $550 suit[54] as creating the next stage of human evolution.[55] Speedo's audacious claim was well-founded, though—the LZR was the fastest competition swimsuit ever made by a significant margin.[56] Like the Fastskins, the LZR was

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[50] Morales, Fajardo & González-García, *supra* note 23; Roberts, *supra* note 23.

[51] *See* Roberts, *supra* note 23 ("Leading up to the 2008 Beijing Olympics, Speedo began toying with a whole new way of making swimsuits, an approach that would make the Fastskin look slow.").

[52] *Industry News: Speedo LZR RACER Debuted in London, Sydney; New York Debut Soon*, Swimming World (Feb. 12, 2008), https://www.swimmingworldmagazine.com/news/industry-news-speedo-lzr-racer-debuted-in-london-sydney-new-york-debut-soon/ [https://perma.cc/R7UC-5EX7]. "LZR" is pronounced "laser."

[53] *Space Age Swimsuit Reduces Drag, Breaks Records*, NASA Spinoff (2008), https://spinoff.nasa.gov/Spinoff2008/ch_4.html [https://perma.cc/HZ9P-BXU9]; Emma Betuel, *Olympics Flashbacks: How a NASA-Designed Swimsuit Rocked the 2008 Games*, Inverse (Aug. 5, 2020), https://www.inverse.com/innovation/olympic-glory-week-lzr-swimsuits [https://perma.cc/48LE-FFFW].

[54] Sindy K. Y. Tang, *The Rocket Swimsuit: Speedo's Lzr Racer*, Science News (Sept. 15, 2008), https://sitn.hms.harvard.edu/flash/2008/issue47-2/ [https://perma.cc/BB3S-USXK]; Dillman, *supra* note 36. Adjusted for inflation, the suit was worth $828 in 2025. *Inflation Calculator*, US Inflation Calculator, https://www.usinflationcalculator.com/ [https://perma.cc/E9MY-9G3Q] (last visited Oct. 14, 2025).

[55] *LZR advertisements featured Michael Phelps as the Vitruvian Man, in Industry News: Speedo LZR Racer Debuted in London, Sydney; New York Debut Soon, supra* note *52.*

[56] The best evidence of how the LZR definitively outmatched other tech suits on the market at the time (also discussed later in this footnote) is how swimmers and their coaches described feeling forced to either wear the LZR or lose races. *See* Associated Press, *Swimmers Might Have to Choose Between Sponsor or Faster Speedo*, ESPN (Apr. 12, 2008, 11:56 ET), https://www.espn.com/olympics/swimming/news/story?id=3343400 [https://perma.cc/K5AU-4NE4]; Betuel, *supra* note 53 ("The coach of the Japanese national swimming team broke an existing sponsor agreement to allow his athletes to wear the suit: 'If swimmers don't wear the LZR Racer, they won't be able to compete,' he said."). Additionally, following the introduction of

skin-tight[57] to reduce drag and muscle fatigue and improve body positioning in the water,[58] such that it had to be replaced before every meet to reap the most compression benefits. Unlike the Fastskins, however, the LZR was constructed using a seamless woven elastane-nylon and polyurethane fabric called the LZR Pulse.[59] The LZR Pulse fabric, combined with additional pure polyurethane panels, trapped tiny pockets of air that made the wearer more

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the LZR, world records began falling at an unprecedent rate. *See* Kelli Anderson, *The War of the Swimsuits*, Sports Illustrated (June 23, 2008), https://vault.si.com/vault/2008/06/23/the-war-of-the-swimsuits [https://perma.cc/FZM4-KEHQ] ("In the first six months of 2004, the last Summer Olympic year, one long-course world record was broken. Twenty such marks have fallen [in the five months following the LZR's introduction], 19 of them to swimmers wearing LZR Racers."). Scientific evidence also showed the LZR offered meaningful drag reduction over the Fastskin. *See Space Age Swimsuit Reduces Drag, Breaks Records*, *supra* note 53 ("The LZR Racer reduces skin friction drag 24 percent more than the Fastskin.").

[57] To give a sense of how tight the LZR and its peer suits were, it would typically take athletes thirty to forty-five minutes to put these suits on and required at least one other person's assistance. One study found the arduous process of inching the suit up one's body gave fifty to eighty percent of wearers blisters on their fingers. Margo Mountjoy, Iouli Gordon, Joseph T. McKeown & Naama W. Constantini, *Medical Complications of an Aquatic Innovation*, 43 Brit. J. Sports Med. 979, 979 (2009). Also, because compression was so important to how these suits functioned and use would stretch them out, top-level swimmers replaced their suits every one to two meets. *See How Tech Suits Helps You Swim Faster*, MySwimPro (2019), https://blog.myswimpro.com/2019/04/17/how-tech-suits-helps-you-swim-faster/ [https://perma.cc/UYL6-MMMD] ("[Tech suits'] lifetime is short. If you wear your suit more than a handful of times, they won't hold their compression as much.").

[58] Also like the full-body Fastskins, the LZR was extremely uncomfortable to put on and wear. A writer for Slate described her experience donning a LZR for the first time: "I was expecting the LZR Racer to be as hard to put on as the wetsuits I've worn for open-water racing—a pain-in-the-ass wriggle that makes you confront some of the more problematic parts of your body. But getting into the Speedo suit is much harder, like a lobster trying to molt backward." Sarah Dickerman, *Full Speedo Ahead*, Slate (Aug. 06, 2008, 14:39), https://slate.com/culture/2008/08/can-the-speedo-lzr-racer-make-me-a-better-swimmer.html [https://perma.cc/3TBC-8RUT]. Twelve-time Olympic medalist Dara Torres recounted having to "sit on the floor and inch it on like panty hose." Keith Naughton, *Speedo: Making a Splash*, Newsweek (June 20, 2008), https://www.newsweek.com/speedo-making-splash-90567 [https://perma.cc/4D2X-V5YV].

[59] Meyer, *supra* note 24, at 9. Polyurethane is a plastic material that first saw widespread use as a rubber substitute in World War Two. *What is Polyurethane?*, Polyurethanes, https://polyurethanes.org/what-is-it/ [https://perma.cc/M88H-YKCJ] (last visited Oct. 26, 2024).

buoyant in the water.[60] The polyurethane was also hydrophobic, such that water would simply run off the swimmer rather than the suit becoming wet.[61] These innovations significantly reduced drag and earned the LZR the nickname of the "rubber suit."[62]

If the original Fastskin made waves in the swimming world, the LZR created a tsunami. "It literally feels like you are a rocket," gushed Michael Phelps when discussing the LZR.[63] Less than two months after its February 2008 launch, eighteen out of nineteen new world records were set by LZR wearers, prompting immediate outcry regarding the LZR's fairness.[64] FINA responded by claiming the LZR had passed a series of tests as part of its "very rigorous" approval system, and that these tests showed "no scientific proof that [the LZR] helps [swimmers' buoyancy] somehow, to the best of FINA's knowledge."[65] This claim was doubtful given both the broad consensus that

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[60] The extent to which the LZR made swimmers more buoyant is a subject of scholarly debate. *See, e.g.*, Morales, Fajardo & González-García, *supra* note 23 (describing conflicting findings regarding buoyancy); *cf.* Meg Maher, *The Impact of Invention on Sport*, Lemelson Ctr. Study Invention & Innovation (Sept. 9, 2019), https://invention.si.edu/impact-invention-sport [https://perma.cc/4Y8M-Z5FS] ("Here's how [the LZR] worked: inflexible, girdle-like polyurethane panels positioned in the lower back and abdomen helped improve posture, repelled water, and trapped air, helping athletes be more buoyant in the water."); Mountjoy, *supra* note 57, at 979 ("Many [believe] that the new swimsuit materials in combination with the design improve buoyancy in the water."); Barrow, *supra* note 17 ("[Polyurethane suits] enclosed tiny pockets of gas that made the swimmer wearing the suit to be far more buoyant."); *see also Rival Swimsuit Approved*, Australian Broad. Corp. (June 4, 2008), https://www.abc.net.au/news/2008-06-05/rival-swimsuit-approved/2460182 [https://perma.cc/9PGC-AT5Y] (noting how Speedo rival Arena marketed its new suit, launched in response to the LZR, as having "polyurethane sections which boost floatability." The suit was approved by FINA.).

[61] Roberts, *supra* note 23; Eric Wilson, *Swimsuit for the Olympics is a New Skin for the Big Dip*, N.Y. Times (Feb. 13, 2008), https://www.nytimes.com/2008/02/13/sports/othersports/13swim.html [https://perma.cc/XQ3T-DNGK] (quoting Michael Phelps discussing the LZR: "The water completely runs off the suit.").

[62] Johnson, *supra* note 25.

[63] Wilson, *supra* note 61.

[64] Associated Press, *FINA Decides Not to Ban New High-Tech Swimsuits*, Taipei Times (Apr. 10, 2008), https://www.taipeitimes.com/News/sport/archives/2008/04/10/2003408867 [https://perma.cc/4F6V-PQRX].

[65] *Id.*; *see* Associated Press, *FINA Disagrees With Critics That New Suit Gives Swimmers Edge*, ESPN (Apr. 8, 2008, 18:53), https://www.espn.co.uk/olympics/swimming/news/story?id=3336132 [https://perma.cc/LSB3-A8P3].

the LZR aided buoyancy[66] and the fact that, at the time, FINA lacked rules prohibiting suits from enhancing athletes' speed, buoyancy, and endurance.[67]

Like in 2000, the fairness debate surrounding the LZR largely focused on its creation of an uneven playing field due to a lack of access, albeit due to sponsorship conflicts and less so supply issues.[68] Both Canada and Italy's national swimming bodies banned the use of the LZR at their Olympic trials,[69] but could not stop other nations' athletes from donning the LZR at the 2008 Beijing Games. National teams and athletes sponsored by Speedo's rivals thus faced a choice: breach their sponsorship agreements, wear the LZR and be competitive, or forgo the LZR and be at a marked disadvantage.[70] As it turned out, this was not much of a choice for those who had dedicated their lives to the pursuit of swimming glory.[71] Despite being sponsored by Speedo competitor brands—among them Nike, Arena, and Adidas—national teams and individual athletes alike chose to break their sponsorships to wear the LZR in Beijing.[72] Speedo's suit was perceived as being so much better that Nike proactively allowed its swimmers to wear the LZR in Beijing, believing its own suit could not compete.[73]

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[66] *See supra* note 60 and accompanying text.

[67] Crouse, *supra* note 3 ("Before [July 2009], FINA did not have a bylaw expressly forbidding swimsuits that might aid speed, buoyancy and endurance").

[68] Craik, *supra* note 26, at 113 ("[T]he primary concern about fairness again focused on the 'level playing field' in terms of access.").

[69] *Id.*; *Associated Press*, *supra* note 65.

[70] Martin Petty, *Space-Age Suits Race into Uncharted Waters*, Reuters (Apr. 15, 2008, 06:30 MT), https://www.reuters.com/article/us-swimming-bodysuits/space-age-suits-race-into-uncharted-waters-idUSSP21700020080415/ [https://perma.cc/6PPM-S8YX] ("Mark Schubert, who has coached the United States team at every Olympics since 1980, said the $550 LZR was 'better than anything seen before' but it left swimmers contracted to other brands with a huge dilemma."); Bardin, *supra* note 4 ("[A] coach told reporters that 'if swimmers don't wear the LZR Racer, they won't be able to compete' in the Beijing Olympics").

[71] Craik, *supra* note 26, at 113 ("Athletes agreed that 'the choice . . . between Olympic success or lucrative rival sponsorships' was a 'no-brainer.'").

[72] Bardin, *supra* note 4 ("The advantage given to racers by the LZR Racer was so great that Japanese authorities decided to break exclusive sponsorship agreements with other companies to allow their racers to use the suits."); Craik, *supra* note 26, at 113 ("South Africa's swimming captain, Gerhard Zandberg, declared he was 'not going to sacrifice performance' and noted that 'Olympic gold is worth much more' than the monetary fine he faced from his sponsor.").

[73] Associated Press, *Nike Allows Swimmers to Wear Speedo's LZR Racer Suit at Olympics*, ESPN (July 30, 2008, 16:41 ET), https://www.espn.com/olympics/summer08/swimming/news/story?id=3511559 [https://perma.cc/8SYC-6B54] ("[Nike] felt it was fair to extend the offer it made in June allowing its swimmers to wear

The 2008 Beijing Games are best known for Michael Phelps's domination in the pool. Less recognized, but arguably just as impressive as Phelps's eight gold medals, was Speedo's domination in the field of swimsuit manufacturers. At the Beijing Games, swimmers wearing the LZR set twenty-three out of the twenty-five new world records, won eighty-nine percent of all medals, and won ninety-four percent of gold medals (including one hundred percent of gold medals in men's events).[74] The last Games at which more records were broken occurred in 1976, when goggles were first introduced to the sport.[75]

C. The Rocket Loses the Arms Race

Speedo and its LZR seemed unstoppable, but their reign would be short. In the months following the Beijing Games, many of Speedo's competitors took the LZR's polyurethane concept and amplified it. The resulting suits, among them the Arena X-Glide and the Adidas Hydrofoil, were made of pure polyurethane (as opposed to the LZR Pulse's polyurethane blend) and were both faster and more buoyant than the LZR.[76] In 2008, 105 world records were broken, with seventy-nine of them broken by swimmers wearing the LZR;[77] yet, within a year of its launch, the LZR was outclassed.

By early 2009, the swimming world was wracked with an existential crisis. Its record books had been almost entirely rewritten and were continually

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Speedo's suit at the U.S. Olympic Trials. 'It is about putting their performance and their focus first,' [a Nike spokesperson] said."). In September 2008, Nike would pull out of the competitive swimwear market entirely. Darren Rovell, *Nike Pulls Out of Olympic Swimwear Battle*, CNBC (Aug. 5, 2010, 13:28 ET), https://www.cnbc.com/id/26827098 [https://perma.cc/RQ55-4AWG].

[74] *Phelps Secures His Place in the History Books After Landing His Eighth Gold Medal!*, Speedo (Aug. 17, 2008), https://web.archive.org/web/20140519093141/http://www.speedo.com/swimming_news/newsroom/swimming_news117.html [https://perma.cc/A5HB-2LA8].

[75] Coleman Hodges, *The History of World Records Getting Broken at World Championships*, SwimSwam (Aug. 3, 2023), https://swimswam.com/the-history-of-world-records-getting-broken-at-world-championships/ [https://perma.cc/K8N3-KY8T]; Tang, *supra* note 54.

[76] Roberts, *supra* note 23; Amy Shipley, *FINA Opts to Ban All High-Tech Swimsuits*, Reachforthewall.com (July 24, 2009), https://web.archive.org/web/20110715160336/http://reachforthewall.com/2009/07/24/suit-story/?hpid=artslot [https://perma.cc/R73M-NP4L].

[77] *FINA extends Swimsuit Regulations*, BBC, http://news.bbc.co.uk/sport2/hi/olympic_games/7944084.stm [https://perma.cc/VZE7-V892] (last updated Mar. 19, 2009).

being rewritten,[78] which reduced the significance of record-setting performances themselves.[79] Competing required an expensive, uncomfortable suit that needed to be frequently replaced. Perhaps worst of all, these suits' performance-enhancing features were altering the nature of swimming itself. As two-time gold medalist and Hydrofoil-wearer Britta Steffen explained: "This suit is of a different world[.] You don't die in the last meters and you feel no pain."[80] Michael Phelps's coach, Bob Bowman, further noted that swimmers' strokes were changing because they no longer needed to work to maintain their buoyancy.[81] To some, the sport in which they competed was no longer swimming.[82] In less than a decade, and particularly in the preceding year, the experience of competing in swimming had been profoundly altered.

FINA, for its part, failed to take any significant action to regulate full-body tech suits as they became ubiquitous between 1999 and early 2009. Despite FINA's responsibility to govern swimming, FINA's Executive Director admitted in July 2009 that FINA had "been looking at this issue for six months only."[83] In March 2009, FINA adopted new rules for suits, limiting, among a variety of regulations, their buoyancy and thickness,[84] but would almost entirely retract these rules three months later due to challenges with

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[78] Only two pre-2008 world records remained unbroken in 2008 and 2009. Steve Connor, *Swimming: World Records Unlikely to be Broken 'For Decades', Warns Expert*, Indep. (Sept. 16, 2011, 00:00 BT), https://www.independent.co.uk/sport/general/others/swimming-world-records-unlikely-to-be-broken-for-decades-warns-expert-2355421.html [https://perma.cc/8YL7-DVEN].

[79] For most professional swimmers, swimming is not a lucrative career. *See infra* note 133 (the highest annual salary of a 2019-20 United States National Team swimmer was $38,928). Given the absence of strong financial incentives, most professional swimmers likely compete out of a love for the sport. For this intrinsically motivated population, the meaning behind attaining a world record significantly explains why they have pursued professional swimming. Harming the meaning of world records, then, hurt professional swimmers' *raison d'être*.

[80] Michael Cowley, *Does My Stroke Look Big in This? Let the Swimsuit Games Begin*, Sydney Morning Herald (July 25, 2009, 10:00), https://www.smh.com.au/sport/swimming/does-my-stroke-look-big-in-this-let-the-swimsuit-games-begin-20090725-gdtnho.html [https://perma.cc/63B7-SWKM].

[81] Amy Shipley, *Swimsuits Cause More Questions Than Answers at World Championships*, Wash. Post (Aug. 3, 2009), https://www.washingtonpost.com/wp-dyn/content/article/2009/08/02/AR2009080201983.html [https://perma.cc/F4F6-95PD].

[82] Cowley, *supra* note 21.

[83] Crouse, *supra* note 3.

[84] Associated Press, *FINA Adopts New Rules for Swimsuits*, ESPN (Mar. 14, 2009, 13:10 ET), https://www.espn.com/olympics/swimming/news/story?id=3980056 [https://perma.cc/5VAD-RSW3].

efficiently testing buoyancy.[85] On July 24, 2009, however, FINA's Congress voted to take significant steps to regulate tech suits (the "Ban"), with 168 nations in favor and only six against.[86] The Ban included limiting suits' coverage of the body from the knees to the navel for men[87] and knees to the shoulders for women, as well as requiring that suits only be made of "textile."[88] The definition of "textile" was left to be determined by an independent swimwear expert, Dr. Jan-Anders Mansson,[89] but was generally understood to not include materials like polyurethane or even zippers, which had been used on all full-body suits going back to 1999.[90] In effect, gone would be the days of full-body tech suits, though non-full-body tech suits would still remain.[91] Unchanged, however, were the record books, which still kept records regardless of the suit worn.[92]

These new regulations were not implemented until 2010,[93] which left a single major swim meet where virtually any suit could be worn. The 2009

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[85] FINA Communications Department, *PR46 – FINA Executive Meeting / Swimsuits*, World Aquatics (June 22, 2009, 03:00), https://www.worldaquatics.com/news/1914335/pr46-fina-executive-meeting-swimsuits [https://perma.cc/CM6G-GFXL].

[86] Tucker & Dugas, *supra* note 41.

[87] This shape of this suit is called a "jammer."

[88] Tucker & Dugas, *supra* note 41.

[89] To this day, Dr. Mansson is responsible for determining swimwear approval at World Aquatics. Jan-Anders E. Mansson, *Biography*, Purdue U. (Apr. 2024), https://engineering.purdue.edu/ChE/people/files/jan-anders.e.mansson.1/CV/MANSSON_BIO-CV_240416e.pdf [https://perma.cc/V6MQ-M8GN].

[90] *FINA World Championships, Swimming: Flash! FINA Bureau Announces Swimsuit Decisions; Speedo Releases Statement*, Swimming World (July 28, 2009, 11:35), https://www.swimmingworldmagazine.com/news/fina-world-championships-swimming-flash-fina-bureau-announces-swimsuit-decisions-speedo-releases-statement/ [https://perma.cc/5NYS-9NVG].

[91] The suits permitted by the Ban are still known as "tech suits." The distinguishing element of pre-Ban tech suits was their full-body coverage.

[92] Andrew Mooney, *Swimming on Steroids: The Suits that Brought Down Records*, Harv. Sports Analysis Coll. (July 21, 2012), https://harvardsportsanalysis.wordpress.com/2012/07/21/swimming-on-steroids-the-suits-that-brought-down-records/ [https://perma.cc/6Y3Y-9L76]; Rachel MacDonald, *"Doping on a Hanger": Regulatory Lessons From the FINA Elimination of the Polyurethane Swimsuit Applied to the International Anti-Doping Paradigm*, 51 Colum. J. L. & Soc. Probs. 275, 276 (2017) ("Despite some experts' calls to distinguish those records set by swimmers wearing polyurethane suits, FINA ultimately did not choose to differentiate or nullify the records.").

[93] *New Swimsuit Rules Valid From January: FINA*, Reuters (July 31, 2009, 11:07), https://web.archive.org/web/20210519000105/https://www.reuters.com/

World Aquatics Championships, dubbed the "Plastic Games,"[94] featured a staggering forty-three new world records; the next-highest record-breaking meet, the 1976 Olympic Games where goggles were first used, had twenty-nine world records.[95] Phelps's, as a Speedo athlete, was forced to wear a now-obsolete LZR. After losing in the 200 meter freestyle to Paul Biedermann, who wore an X-Glide and beat Phelps's world record by 0.96 seconds,[96] the man who won eight gold medals in a partially polyurethane suit changed his tune on them, threatening to boycott swimming until polyurethane suits were no longer in the sport.[97] FINA had loosely set a goal of implementing the Ban by May 2010; just two days after Phelps' threat, FINA accelerated the implementation of the Ban by four months.[98] On January 1, 2010, the full-body tech suit era officially ended.

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article/us-swimming-world-suits-sb-idUSTRE56U4FW20090731/ [https://perma.cc/5RMM-9G9N].

[94] Karen Crouse, *Redefining Fast at the 'Plastic Games'*, N.Y. Times (Aug. 3, 2009), https://www.nytimes.com/2009/08/04/sports/04swim.html [https://perma.cc/T2TT-QTEA].

[95] Hodges, *supra* note 75. For additional context, there are fewer than forty Olympic swimming events across both men's and women's competition. Prior to the polyurethane era, records were broken approximately every four years. Roberts, *supra* note 23. During the polyurethane era, records were being broken several times over within a single meet—first in preliminary heats and then again in the finals of the same event. *Id.* This was highly unusual as top swimmers typically hold back in preliminary heats to conserve energy for finals, but the suits were so performance-enhancing that these athletes broke world records even in preliminary heats. *Id.*

[96] *Brilliant Biedermann Beats Phelps*, BBC (July 28, 2009), http://news.bbc.co.uk/sport2/hi/other_sports/swimming/8172708.stm [https://perma.cc/6WWG-FGUN]. Biedermann was a relative no-name compared to Phelps, yet he beat Phelps by 1.22 seconds. While not a blowout, 1.22 seconds in the 200-meter freestyle is a large margin of victory. *Id.* Biedermann's performance was staggering, both in regard to his victory over Phelps, in setting a new world record, and relative to Biedermann's past performances. A year prior, at the Beijing Games, Biedermann was fifth in the 200-meter freestyle while Phelps was first. Tucker & Dugas, *supra* note 18. In a single year, Biedermann shaved four seconds off his 200-meter freestyle, an extremely rare feat at his level; besting a world record by nearly a second in a relatively short race like the 200-meter freestyle was equally rare. *Id.* Biedermann attributed much of his success to the X-Glide. *Id.*

[97] Cowley, *supra* note 21. In 2008, Bob Bowman said for a story on Phelps and the LZR: "The swimmer makes the suit, not the other way around." Naughton, *supra* note 58.

[98] *New Swimsuit Rules Valid from January: FINA*, *supra* note 93.

D. Decision-making at FINA/W.A.

Since 2010, the essential components of the Ban have remained in effect and are strictly enforced: suits cannot extend past the knees or above the navel for men or past the knees or above the shoulders for women,[99] and cannot aid swimmers' speed, buoyancy, or endurance.[100] FINA/W.A. have further built out a substantial regulatory scheme for competition swimwear. All suits worn in competitions must be approved by W.A.[101] To be approved, suits must comply with a variety of specific regulations that limit their body coverage,[102] structure,[103] type of material (i.e., only "textile Fabric(s)"),[104] thickness,[105] permeability,[106] and construction.[107] Suits may not be customized.[108] All suit testing for compliance with these regulations is performed by an independent swimwear expert.[109] To avoid conflicts of interests, this expert is barred from having relationships with suit manufacturers and cannot have had a relationship with them within the five years preceding their appointment.[110] Suits must also be widely available for purchase to be used in competition.[111]

W.A. itself is an imperfect organization. It oversees many watersports worldwide, including swimming, water polo, and diving. Despite its far-reaching responsibilities, it is underfunded[112] and suffers from similar corruption experienced by other SGBs.[113] W.A.'s highest legislative body is its

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[99] World Aquatics, *supra* note 1, at pt. 2, art.§ 15.2.

[100] *Id.* pt. 2, art. 15.3.

[101] *Id.* pt. 1, arts. 7.2.1, 7.5.

[102] *Id.* pt. 1, art. 7.5.1.1.2.

[103] *See id.* pt. 1, art. 7.5.1.2.

[104] *See id.* pt. 1, art. 7.5.1.4.1.

[105] *See id.* pt. 1, art. 7.5.1.5.1.

[106] *See id.* pt. 1, art. 7.5.1.5.2.

[107] *See id.* pt. 1, art. 7.5.1.6. Suits can, however, have any color or combination of colors. *See id.* pt. 1, art. 7.5.1.3.

[108] *See id.* pt. 1, art. 7.5.7.5.

[109] *See id.* pt. 1, art. 7.2.3. The current independent swimwear expert is Dr. Mansson. *See* Mansson, *supra* note 89.

[110] *See* World Aquatics, *supra* note 1, pt.1, art. 7.2.4.

[111] *See id.* pt. 1, arts. 7.2.7, 7.5.7.1.2.

[112] For example, W.A.'s 2022 revenue was a mere $43 million, with a net deficit of $16.4 million and the majority of its expenditures going to hosting sports events. *See* World Aquatics Financial Report 2022 (2023), https://resources.fina.org/fina/document/2023/06/23/73e99383-46ee-4349-844e-10d5a94cc2fc/World-Aquatics-2022-Financial-report-final-signed-.pdf [https://perma.cc/CQQ5-XE7Q].

[113] *See* MacDonald, *supra* note 92, at 312–13*; see also* Andy Bull, *Poison in the Pool: Can Scandal-Hit Swimming be Trusted in Rio?*, Guardian (Aug. 4, 2016), https://www.

Congress, the same entity that voted in favor of the Ban. W.A. has 209 member countries,[114] and each member state has two representatives at Congress;[115] member states with larger swimming communities have no greater voting power than their smaller peers.

The means through which decisions are made at W.A. is considerably opaque. To be sure, W.A. has some formal structures, such as the tech-suit approval process overseen by the independent swimwear expert. Another example is the Swimming Technical Committee, which is tasked with "investigat[ing], study[ing], and [providing recommendations] on matters dealing with standard equipment and specifications of competitive pools."[116] However, some decision-making likely also occurs informally, with votes held as mere formalities.[117] This, combined with allegations of corruption, make

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theguardian.com/sport/2016/aug/04/poison-pool-swimming-scandal-trust-rio-2016-olympics-fina [https://perma.cc/LEC4-EF4D] (describing evidence of rampant corruption within FINA leadership); James Sutherland, *FINA President Al-Musallam Under Investigation for Corruption in FIFA Case*, SwimSwam (Sept. 3, 2021), https://swimswam.com/fina-president-al-musallam-under-investigation-for-corruption-in-fifa-case/ [https://perma.cc/GS3T-T47G] (reporting on a 2021 corruption investigation into the President of FINA, Husain Al-Musallam, who continues to hold this role today); *see also Swimming Hit by Corruption Charges*, Radio France Int'l (July 19, 2017), https://www.rfi.fr/en/sports/20170719-swimming-hit-corruption-charges [https://perma.cc/KF34-AME5] (reporting on 2017 International Olympic Committee and FBI investigations for corruption into Husain Al-Musallam); *see also* Liam Morgan, *FINA to Set Up Integrity Unit After Report Highlights "Significant Issues" with Governance*, Inside the Games (Oct. 11, 2021), https://www.insidethegames.biz/articles/1114085/fina-reform-report-criticises-governance [https://perma.cc/TJ59-X7PY] (summarizing 2021 report by the FINA Reform Committee, which found "significant issues" in FINA's governance; further, noting the FINA Reform Committee was established by Husain Al-Musallam.); *see also* Taylor Brien, *FINA is Doomed*, Swimming World (Sept. 21, 2015), https://www.swimmingworldmagazine.com/news/fina-is-doomed/ [https://perma.cc/9SXJ-T9AC] (describing an ultimately fruitless effort by a cadre of American swim coaches to establish new international swimming SGB to replace FINA due to FINA's perceived corruption).

[114] *See Overview and History*, World Aquatics, https://www.worldaquatics.com/about [https://perma.cc/VB6N-XUJD].

[115] *See* World Aquatics Const. art. 13.5 (2023).

[116] *Swimming Technical Committee*, World Aquatics, https://www.worldaquatics.com/swimming/technical-committee [https://perma.cc/EJ88-HEAM]. Recommendations made by the Technical Swimming Committee are passed to another body called the "Bureau," which is second in authority only to the Congress but has a much wider purview. *See id.*; World Aquatics Const., *supra* note 115, art. 17.

[117] For example, the 2021 FINA General Congress held fourteen votes; for thirteen of these votes, representatives had the option to vote (i) "yes," (ii) "no," or (iii) "abstain." *Scrutineers Confirmation of Elections and Voting Results*, FINA (June 6, 2021),

the actual decision-making processes at W.A. unclear. Although Congress successfully passed the Ban through its democratic process, only insiders know which of W.A.'s decisions occur as a result of democratic means or otherwise.

III. Regulatory Considerations

Before FINA's decision-making concerning tech suits can be analyzed, it is worth discussing how SGBs generally make decisions around new technologies. Regulation of technology in sports affects a combination of one or more of the following factors: (1) the 'levelness' of the playing field, measured by the accessibility and affordability of the technology; (2) safety while playing the sport; (3) the tradition of the sport and the extent to which the sport reflects societal conditions; (4) the market for the particular technology, implicating both the manufacturer and the athletes and SGBs sponsored by the manufacturer; and (5) the general public's interest in the sport.[118] Although safety is largely a non-issue in swimming,[119] the four remaining factors are further discussed below.

A. The Level Playing Field

Sports are not fair, though the perception of fairness is key to sports' legitimacy. While many of Michael Phelps's accomplishments can be attributed to his work ethic, he was also genetically predisposed to swimming success, carrying a six-foot four-inch frame and having unusually long arms.[120] Phelps' competitors did not have the same genetic makeup and thus lacked the same

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https://resources.fina.org/fina/document/2022/01/20/96e8a19b-3679-4c2c-84b5-0ba93973e7a6/Scrutineers-Confirmation-of-Results-Doha-General-Congress.pdf [https://perma.cc/37P9-7VW5]. In these thirteen votes, the most contentious had ninety percent "yes" votes; all other votes had a higher percentage of "yes" votes. *Id.* Representatives from 183 members states attended the 2021 FINA General Congress, many of which vary considerably in their population, economic status, and swimming success. *Id.* Presumably, member states have competing interests, so the near-unanimity displayed at the 2021 FINA General Congress indicated decisions may have been made at an earlier time. *See id.*

[118] *See* World Aquatics, *FWAC 2014: Jan Anders Manson*, YouTube (Mar. 25, 2015), https://www.youtube.com/watch?v=wJ-JImReDYo [https://perma.cc/VC2R-KVA6] (detailing these factors).

[119] *Id.*

[120] *Is it a Genetic Flaw that Makes Phelps's the Greatest?*, Sydney Morning Herald (Aug. 16, 2008, 10:00), https://www.smh.com.au/sport/

advantages he benefited from. While this may have been unfair, it did not affect the legitimacy of the sport of swimming—that is, in a competition to determine who is the best swimmer, Phelps' genetic advantages did not affect the perception that he was legitimately the superior swimmer.

The 'level playing field' is the best approximation of fairness. If a sports contest's goal is to measure who is the best performer, then the competition rules must impose the same burdens on each competitor.[121] As further explained by sports philosopher James Keating: "To the extent that one party to the contest gains a special advantage, unavailable to his opponent[,] then that advantage is unfair."[122] That "special advantage," though, must come from external factors, not those innate to the athlete. Accordingly, a sport can achieve a level playing field, and, thus, legitimacy as a competition, when all competitors have access to the same technological advantages.

B. The Tradition of the Sport of Swimming

There is no such thing as 'pure' swimming.[123] In this, tech suits could not corrupt swimming simply because they altered the sport. Sports are a reflection of society and evolve as society does,[124] and evolution can be positive for a sport. Some, however, have gone so far as to argue that the integrity of the sport of swimming dictates that swimmers compete as close to in the nude as possible, because human skin has been the only constant factor in swimming for millennia.[125] This view misunderstands how swimming has changed over time.

Since the beginning of the modern Olympic era in 1896, swimming has constantly evolved. Even the physical activity itself has changed. Present-day swimming includes four strokes (butterfly, backstroke, breaststroke, and

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is-it-a-genetic-flaw-that-makes-phelps's-the-greatest-20080816-gdsqwk.html [https://perma.cc/KW6X-9LQ7].

[121] James W. Keating, *Sportsmanship as a Moral Category*, 75 Ethics 25, 33–34 (1964).

[122] *Id.*

[123] *But see supra* note 19 and accompanying text.

[124] *The Importance of Sports in Society*, Ark. State Univ. (May 7, 2020), https://degree.astate.edu/online-programs/business/master-of-science-sports-administration/the-importance-of-sports-in-society/ [https://perma.cc/FEN6-GDTA].

[125] Roberts, *supra* note 23 ("The one thing that hasn't changed since the Olympics were first held in ancient Greece is human skin. If FINA really wants to maintain the integrity of the sport, perhaps they should have swimmers compete the same way the Greeks once did: in the nude.").

freestyle) as well as medley events, where competitors swim all four strokes in a single race.[126] Yet breaststroke was not introduced to the Olympics until 1904,[127] butterfly until 1956,[128] and medleys until 1964.[129] The sport of swimming has ranged from competing in the frigid Mediterranean to temperature-controlled pools,[130] from wearing wool to polyurethane suits, from one stroke to four and a medley, and beyond. The notion that swimming is pure—no more than a competition of man versus water—ignores the ever-present change occurring in the sport.

There is, however, merit to this view insofar as there are essential components of the sport that make it 'swimming.' Although swimming has evolved, so too have some constants remained. For there to be swimming, there must be humans moving their bodies in water to determine who can traverse a distance the fastest. FINA itself stated that "[swimming's] main and core principle [is] a sport essentially based on the physical performance of the athlete."[131] This is to say that swimming must be a sport where athletes' personal attributes determine the outcome, and not the equipment they use. Additionally, a core component of swimming is its grueling nature.[132] With the exception of the shortest event, the fifty-meter freestyle, athletes in every race experience significant pain from trying to maintain their pace while being exhausted.[133] Swimming is an endurance sport, and this necessarily entails enduring pain.

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[126] World Aquatics, *supra* note 1, pt. 2, arts. 5–9.

[127] *The History of Breaststroke Swimming*, Swim Eng. Swimming, https://www.swimming.org/sport/history-of-breaststroke/ [https://perma.cc/PN9E-BVCU] (last visited Oct. 26, 2024). The first Olympic breaststroke competition was 440 yards, a distance that is also no longer used; the 100- and 200-meter breaststroke are the only current Olympic breaststroke events. *Id.*

[128] *The History of Butterfly Swimming*, Swim Eng. Swimming, https://www.swimming.org/sport/history-of-butterfly/ [https://perma.cc/PZD6-VXVU] (last visited Oct. 26, 2024).

[129] *The History of Individual Medley Swimming*, Swim Eng. Swimming, https://www.swimming.org/sport/history-of-individual-medley/ [https://perma.cc/JTD6-NRQJ] (last visited Oct. 26, 2024).

[130] *The History of Olympic Swimming*, Int'l Olympic Comm. (Dec. 17, 2018, 05:40 GMT), https://olympics.com/en/news/the-history-of-olympic-swimming [https://perma.cc/GUK8-XRPF] ("[Athletes were] exposed to temperatures of 13°C in the Mediterranean (a modern Olympic pool is around 25–28°C).").

[131] *FINA Adopts New Rules for Swimsuits*, *supra* note 84.

[132] Charles Hartley, *Pain is the Essence of Swimming*, SwimSwam (Aug. 8, 2017), https://swimswam.com/pain-essence-swimming/ [https://perma.cc/3BDD-GNRP].

[133] *Id.*; *see* Olivier Poirier-Leroy, *Bring the Pain: How to Deal with the Agony of Hard Swim Practices and Races*, YourSwimBook, https://www.yourswimlog.com/bring-the-pain/ [https://perma.cc/6VQT-KMPB] (last visited Oct. 26, 2024)

Lastly, as a timed sport, swimming relies on its record book more than most sports.[134] At the top levels of swimming, races are two-dimensional: competitors race against those in the pool with them and every swimmer who raced before them. The same arguments regarding the fairness of tech suits in a race can be used in the record book context; a competitor using an unfair advantage damages the legitimacy of a competition, be it one where the athletes are still wet or one against every swimmer who has ever competed in that event. If the record book is rewritten through illegitimate means, why should anyone still care?

C. The Market for a Technology

Although this factor is fairly self-explanatory, the relationship between SGBs, swimmers, and suit manufacturers must be described. Swimsuit manufacturers are the primary sponsor and source of income for most professional swimmers;[135] this was a key reason behind why swimmers' decision to break their sponsorships to wear a faster suit in 2008 and 2009 was so consequential. Manufacturers are also significant sponsors of swimming governing bodies, including FINA/W.A. and USA Swimming.[136] Notably, Speedo was

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(quoting five-time gold medalist Don Schollander: "If you can push yourself through that pain barrier into real agony, you're a champion."); Alan Goldberg, *Managing the Pain & Fatigue of Oxygen Debt in Practice and During Races*, USA Swimming News (Apr. 22, 2022), https://www.usaswimming.org/news/2022/04/22/managing-the-pain-fatigue-of-oxygen-debt-in-practice-and-during-races [https://perma.cc/WTM4-YKGD].

[134] Written the day after Biedermann's world record 200-meter freestyle, the author describes how "swimming relies heavily on history and world records for its interest [and] so generations are often compared by [records]." He then laments that "[the] current swimsuit situation negates that comparison entirely." Ross Tucker, *Swimming World Records – Not a Good Day for Speedo*, Sci. Sport (July 29, 2009), https://web.archive.org/web/20240416114204/https://sportsscientists.com/2009/07/swimming-world-records-not-a-good-day-for-speedo/ [https://perma.cc/H85V-ATNM?type=image].

[135] Tucker & Dugas, *supra* note 18. For additional context, the most a 2019–20 United States National Team swimmer could expect to be compensated by USA Swimming was $38,928. *See 2020 Quad Athlete Support Program*, SwimSwam, https://swimswam.com/wp-content/uploads/2019/08/2020-quad-athlete-support-program-post-update_2.pdf [https://perma.cc/38S2-97N6].

[136] *See, e.g.*, Michael Long, *Speedo Dives in for Fina Swimming World Cup Series*, SportsPro (Aug. 5, 2015), https://www.sportspromedia.com/news/speedo_dives_in_for_fina_swimming_world_cup_series/?zephr_sso_ott=kd9BbZ [https://perma.cc/9RQK-Y3TS]; Associated Press, *Italian Swimsuit Company Signs on as*

FINA's exclusive swimwear sponsor from 2004 to 2008.[137] For manufacturers, tech suits do not represent a core revenue stream but, coupled with sponsorships, serve more so as a helpful marketing tool that gives manufacturers credibility.[138]

D. Public Interest in Swimming

Except for during the Olympic Games, swimming is not a popular sport.[139] In the United States, for example, there are approximately three times as many high school soccer players and four times as many high school track and field athletes as there are high school swimmers.[140] There are a variety of reasons that explain swimming's relative lack of popularity. For one, unlike the 162-game MLB season, the eighty-two-game NHL and NBA seasons, and even the seventeen-game NFL season, swimming's World Championships only occur every two years and the Olympics, every four years.[141] There

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FINA Sponsor, San Diego Union-Tribune (Jan. 24, 2014), https://www.sandiegouniontribune.com/sdut-italian-swimsuit-company-signs-on-as-fina-sponsor-2014jan24-story.html [https://perma.cc/97Y8-YMVZ]; *USA Swimming, Arena Partnership Extended Through 2024*, USA Swimming (Feb. 21, 2023), https://www.usaswimming.org/news/2023/02/21/usa-swimming-arena-partnership-extended-through-2024 [https://perma.cc/R8FH-Y7CN]; Craik, *supra* note 26, at 77 (quoting then-FINA Executive Director Cornel Marculescu:"[T]he health and wealth of the sport of swimming is inter-linked with the fortunes of the swimwear industry which makes a significant contribution to the federations and athletes in terms of promotion and financial support.").

[137] *Speedo Signs New Deal with the Int'l Federation of Swimming*, Sports Bus. J. (Aug. 23, 2004), https://www.sportsbusinessjournal.com/Daily/Issues/2004/08/23/Sponsorships-Advertising-Marketing/Speedo-Signs-New-Deal-With-The-Intl-Federation-Of-Swimming.aspx [https://perma.cc/5CPT-J6G2].

[138] Naughton, *supra* note 58 ("[The] LZR Racer is a pretty small part of our business, under 5 percent," says [Speedo parent company] president Helen McCluskey. "But it's what gives us credibility. It's the couture version of Speedo.").

[139] Rian Covington, *Making Swimming a More Spectator-Friendly Sport*, Swimming World (Nov. 14, 2022, 12:12), https://www.swimmingworldmagazine.com/news/making-swimming-a-more-spectator-friendly-sport/ [https://perma.cc/D9QH-RP86].

[140] *High School Athletics Participation Survey*, Nat'l Fed'n State High Sch. Ass'ns, https://www.nfhs.org/media/5989280/2021-22_participation_survey.pdf [https://perma.cc/H4YE-LVVN].

[141] Arguably, the other sports' championships would be a more suitable analog. However, the World Championships and the Olympics are some of the only occasions where swimming is broadly televised, whereas even regular season baseball,

are a limited number of high-level competitions because athletes must train (as opposed to race) the vast majority of the time to be competitive.[142] Access to pools is also a critical issue, even in developed countries like the United States, and is particularly felt along socio-economic lines.[143] For most people, swimming only comes to mind during the Olympics.

Swimming is also not particularly audience-friendly. Swim meets are rarely televised, and watching in-person often means persevering through humid and chlorinated air to watch dozens of heats before the top competitors swim; even if watching a televised swim meet, the fact remains that most people find it boring.[144] There is no contact, no team play outside of relays, and water obscures spectators' viewing experience. Relative to even its closest peer sport, track and field, swimming is slower-paced and less exciting.

Because of these shortcomings, swimming has two critical means of driving interest in the sport. The first is, of course, the Olympic Games. When people are exposed to Olympic swimming, many become interested in it. USA Swimming's membership, for example, surges four to twelve percent

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hockey, basketball and football are frequently nationally televised. *Why Nobody Cares About Swimming*, MySwimPro, https://blog.myswimpro.com/2023/07/24/why-nobody-cares-about-swimming/ [https://perma.cc/F5WK-FGQ7].

[142] For important meets, athletes train for months or even years before reducing their training for a one-to-four-week period prior to their meet (called a "taper"). *A Guide to Swimming Tapering*, EatSleepSwimCoach (Nov. 21, 2022), https://www.eatsleepswimcoach.com/swimming-tapering/ [https://perma.cc/SX37-C2KX]. The effect of this regimen means that elite swimmers can only produce top times on a few occasions at most per year.

[143] A 2017 study conducted by the University of Memphis and University of Nevada-Las Vegas found that "79 percent of children in families with household income less than $50,000 have no/low swimming ability," and "children who qualify for free or reduced school lunch programs are 63 percent less likely to have good swimming ability." USA Swimming Foundation, *USA Swimming Foundation Announces 5-10% Increase in Swimming Ability Among U.S. Children*, PR Newswire (May 25, 2017, 09:16 ET), https://www.prnewswire.com/news-releases/usa-swimming-foundation-announces-5-10-increase-in-swimming-ability-among-us-children-300463644.html [https://perma.cc/6J2K-4E97].

[144] *Why Nobody Cares About Swimming*, *supra* note 141 ("A lot of people don't care about swimming because it's *boring*. To the majority of people, swimming just isn't fun to watch.").

in post-Olympic years.[145] Second, world records are key.[146] The experience of watching a world record-setting performance involves witnessing human history. World records also create a headline, which is useful for a sport that gets little attention. However, the opposite is also true: a lack of new world records at the Olympic Games is viewed as disappointing by the public[147] and may lead to a lack of renewed interest in swimming.

E. On SGBs' Purpose and Goals

There is no 'right' way for SGBs to balance the factors described above when deciding how to regulate a new technology in their sport(s). Goggles are widely considered an acceptable technology as chlorine is harmful to eyes,[148] yet there remains a reasonable argument that the use of goggles in the 1976 Olympics was unfair to the world record holders from the goggle-less 1972 Olympics, among them Mark Spitz.[149] Although most would agree that safety should take priority over a level playing field in this instance, the fact remains that 1976 Olympians used technology that was unavailable to Spitz and his peers.[150] Even in non-edge cases like goggles, there is room for debate.

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[145] 2021 Membership Demographics Report – Athlete, Club and Non-athlete Membership, USA Swimming (Feb. 2022), https://www.usaswimming.org/docs/default-source/governance/governance-lsc-website/membership-demographics/2021-membership-demographics-report.pdf?sfvrsn=80510b32_10 [https://perma.cc/53PS-R5ZE].

[146] *See* Tucker & Dugas, *supra* note 18.

[147] *See, e.g.*, Shane Keating, *Just One Swimming World Record Has Fallen at the Paris Olympics. Is the Pool to Blame?*, Guardian (Aug. 1, 2024), https://www.theguardian.com/sport/article/2024/aug/01/paris-olympics-2024-swimming-world-records-less-slow-pool [https://perma.cc/XHH2-3YHE].

[148] Rushall, *supra* note 19.

[149] *Mark Spitz*, World Aquatics, https://www.worldaquatics.com/athletes/1149730/mark-spitz [https://perma.cc/M233-EKAU]. Mark Spitz was an American swimmer who won seven gold medals, each in world-record time, at the 1972 Games. *Id.*

[150] To be clear, the fact that a technology increases safety does not automatically mean it should be allowed in a sport. The use of a pitching machine could guarantee baseball batters would have no risk of being hit by a pitch, but it would be ruinous to baseball tradition. In the goggles example, goggles are viewed as acceptable because the safety benefits are so high relative to the modest harm to the level playing field and swimming tradition.

IV. Analyzing FINA's Ban

The Ban was FINA's attempt to recreate a level playing field and return to the traditions of swimming.[151] FINA found itself in an unenviable position in 2009 as it faced a multifaceted problem. The swimming community wanted to do away with full-body polyurethane suits, but professional swimmers, FINA, and national SGBs were more financially dependent on their manufacturer sponsorships than ever before, likely as a result of the proliferation of these same suits.[152] Moreover, the record books had been nearly completely rewritten in 2008 and 2009, and any regulations that curbed the suits' effectiveness risked world records not being broken for decades, or perhaps ever.[153] Lastly, FINA needed a solution that would prevent another technology from leapfrogging polyurethane and creating unfair dominance once more.

To some, the Ban was a success story.[154] They praised the administrability of the Ban's bright-line rules regarding suits' body coverage[155] and how, despite corruption within FINA, the organization was still able to successfully regulate itself to promote fairness. To their credit, the Ban's essential components of limiting body coverage and suits' performance enhancement remain in place today.

Fifteen years following the Ban, however, the results appear less satisfactory. Although the Ban obviously addressed swimming's most pressing issue (i.e., full-body tech suits), it failed to address the still-open question: how to adequately limit performance-enhancing technology in swimming. As other

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[151] *See* Roberts, *supra* note 23 ("The ban was nominally made in the interest of equal access to equipment, but it was also a clear attempt to maintain the sense of gradual progression in the sport.").

[152] Morales, Fajardo & González-García, *supra* note 23 ("[The tech-suit arms race] produc[ed] a growing advertising war to capitalize on the potential benefits of gold medals and sponsorships.").

[153] Connor, *supra* note 78 (quoting the Director of the Centre for Sports Engineering Research at Sheffield Hallam University: "A ban on swimsuits has created an insurmountable rift in performance at the highest levels of the sport. In the fastest swimming events, competitors are at such a disadvantage that the current world records could remain unbroken for decades."). As noted in Sections III(B) and III(D) *supra*, world records are important both to the tradition of swimming and for driving fan interest.

[154] *See, e.g.*, MacDonald, *supra* note 92, at 278 ("Upon realizing polyurethane swimsuits stood to radically change swimming, FINA implemented regulation that swiftly and successfully eradicated the problem.").

[155] *Id.* at 299–300.

forms of technology enter the sport in the post-Ban era,[156] the Ban is better understood as only a half-measure requiring additional regulation, which, in turn, has not materialized.

A. Evening the Playing Field at the Highest Levels of Swimming

The uneven playing field that attracted the most media attention was how the competitive advantage of full-body tech suits forced swimmers to choose between wearing the fastest suit or remaining loyal to their sponsor. To some extent, the Ban succeeded in this regard. Of the tech suits that followed the Ban, none have been alleged to provide a material advantage relative to their peer tech suits. As a result, top athletes can now be sponsored by whichever manufacturer they choose, without having to worry about the risk of serious competitive disadvantage.

Nevertheless, the lack of allegations of unfairness does not mean there is not still potential for abuse. While customized suits are banned,[157] Speedo now brings to market tech suits that are designed for a particular athlete. For example, Speedo's LZR Pure Intent was made in collaboration with and to the specifications of seven-time gold medalist Caeleb Dressel.[158] Dressel thus swims in a de facto customized suit while his competitors do not, giving Dressel an unfair advantage.[159]

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[156] *Infra* note 180.

[157] World Aquatics, *supra* note 1 pt. 1, art. 7.5.7.5.

[158] *Caeleb Dressel's Secret Weapon? The Suit He Helped to Design*, TheNewsMarket (July 31, 2021), https://web.archive.org/web/20210813224417/https://www.thenewsmarket.com/news/caeleb-dressel-s-secret-weapon--the-suit-he-helped-to-design/s/29b05e75-45d6-423d-909e-81d8a30ce038 [https://perma.cc/UX8M-7YYS].

[159] "[T]ailor-made" tech suits are curiously, but expressly, permitted under W.A.'s Competition Regulations, provided that such tailor-made suits are "accessible on the market to any athletes." Word Aquatics, *supra* note 1, at pt. 1, art. 7.5.7.5. "No customisation" of suits is permitted, though the only difference between custom versus "tailor-made" suits appears to be their availability for purchase on the market; neither term is defined within the Competition Regulations. *Id*. W.A.'s justification for this, perhaps, lies in tech suits' post-Ban effectiveness. Because tech suits' body coverage is so limited post-Ban, the extent to which tech suits help swimmers is also limited. This is particularly true for male swimmers. Dressel enjoys an advantage, but it may be miniscule. There is also always the chance that Speedo or other manufacturers develop suits for other athletes. This seems unlikely, though, as no manufacturer has unveiled a similarly customized suit since 2021 and Dressel, as the top American male swimmer, is particularly monetizable, thus creating more of a business case for making him a customized suit. *See* Pat Forde, *2021 Athlete of the Year: Seven-Time*

The Ban's more wide-reaching impact vis-à-vis establishing a level playing field, though, was its entrenchment of cost for participants in the sport. For athletes sponsored by a suit manufacturer, tech suit costs are less relevant as these athletes typically receive suits for free. However, for all non-sponsored athletes—the vast majority of competitive swimmers—cost remains a real consideration.

A sport can only be accessible to the extent that it is affordable. Elite swimming carries unavoidable expenses; daily practices, team and coaching fees, traveling to and from meets, healthcare, and nutrition pose financial burdens.[160] However, the introduction of tech suits created a new cost to participants that could, and did, easily stretch into the thousands of dollars per year. The Ban allowed tech suits to remain in the sport and, in doing so, cemented additional costs for participants; many of the best tech suits today cost between $300 to $500 for men[161] and $400 to $650 for women.[162] These suits often last for just two meets.[163] Additionally, tech suits designed for only a single stroke have begun to proliferate,[164] requiring swimmers

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Olympic Gold Medalist Caeleb Dressel, Sports Illustrated (Dec. 8, 2021), https://www.si.com/sportsperson/2021/12/08/caeleb-dressel-tokyo-olympics-si-athete-of-the-year [https://perma.cc/4E6J-EKHJ].

[160] *See, e.g.*, *Michael Phelps' 10000 Calories Diet: What the American Swimmer Ate While Training for Beijing Olympics?*, Int'l Olympic Comm. (May 16, 2021, 05:36 GMT), https://olympics.com/en/news/michael-phelps-10000-calories-diet-what-the-american-swimmer-ate-while-training- [https://perma.cc/YM6C-SJ7F].

[161] *See, e.g.*, *Racing Suits*, Arena, https://www.arenasport.com/en_us/men/swimwear/racing-suits.html [https://perma.cc/F2HU-4CG7] (last visited Oct. 26, 2024); *Mens Elite Swimwear*, Speedo, https://us.speedo.com/men/elite-competition-swimwear.list [https://perma.cc/9KS5-2LAW] (last visited Oct. 26, 2024).

[162] *See, e.g.*, *Racing Suits*, Arena, https://www.arenasport.com/en_us/women/swimwear/racing-suits.html [https://perma.cc/YBL6-XJQG] (last visited Oct. 26, 2024); *Womens Elite Tech Suits*, Speedo, https://us.speedo.com/women/elite-competition-swimwear.list [https://perma.cc/Y2QR-LXQT] (last visited Oct. 26, 2024).

[163] *See How Tech Suits Helps You Swim Faster*, *supra* note 57. Tech suits' primary performance-enhancing feature is their compression; when these suits are worn, they can stretch out and lose their compression fairly quickly.

[164] *See, e.g.*, *Men's Fastskin LZR Pure Intent Backstroke Edition Jammer Tech Suit Swimsuit*, Swimoutlet.com, https://www.swimoutlet.com/products/speedo-mens-fastskin-lzr-pure-intent-backstroke-edition-jammer-tech-suit-swimsuit-8211191/?color=blackrosegold [https://perma.cc/DEH3-GP5T] (last visited Oct. 26, 2024); *Men's Fastskin LZR Pure Valor 2.0 Jammer - Fina Approved*, Speedo, https://us.speedo.com/men-s-fastskin-lzr-pure-valor-2.0-jammer/14990653.html [https://perma.cc/6FMX-DVX5] (last visited Oct. 26, 2024) ("[This] jammer offers greater flexibility and may be preferred by breaststroke and IM swimmers.").

who swim multiple strokes to either purchase additional tech suits or be at a disadvantage.[165]

Tech suits may make swimming cost-prohibitive for many people. There is circumstantial evidence that USA Swimming believes cost is a significant barrier to entry to swimming; in 2020, it banned the use of tech suits for all athletes ages twelve and under.[166] American athletes thirteen and over, though, must still purchase tech suits in order to be competitive.[167] Further, this cost barrier to participate in the sport may have a greater impact on non-American swimmers in the 209 member states governed by W.A. For example, one of the newest W.A. members, Bhutan, only had hotel pools when it joined FINA in 2017,[168] and only in 2021 did it sign an agreement with FINA to build its first-ever competition swimming pool,[169] which was completed in 2024.[170] With so few available pools to train in the country, the participation cost for swimmers in Bhutan is not solely related to equipment but, more fundamentally, to the high cost of pool access itself. For some W.A. member states, as illustrated by the Bhutan case, cost sensitivities are felt long before tech suit costs enter the picture.

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[165] To be sure, the precise impact of these stroke-specific tech suits has yet to be measured in publicly-available sources. Regardless, a backstroke swimmer wearing a backstroke-tailored suit may benefit from a placebo effect of knowing they have the best possible suit, whereas a swimmer who lacks a stroke-specific suit may perceive themselves to be at a disadvantage and hurt their performance.

[166] Tom Avischious, *Tech Suit Information for Officials*, USA Swimming (2020), https://www.usaswimming.org/docs/default-source/officialsdocuments/misc-officials/tech-suit-for-officials.pdf [https://perma.cc/246W-D79S].

[167] Wall Street Journal, *The Cost of Becoming an Olympic Swimmer for Team USA | WSJ*, YouTube (July 30, 2021), https://www.youtube.com/watch?v=OAFc_CA2YQg [https://perma.cc/3P3S-9B3P] (stating (i) a competitive swimmers' annual spend on tech suits can easily stretch into the thousands of dollars, (ii) by the time a competitive American swimmer reaches the collegiate level, they will have spent between $16,000 to $40,000 on club team dues alone, and (iii) expenses for Olympic swimming hopefuls typically range from $25,000 to $40,000 annually).

[168] Braden Keith, *FINA Announces Kingdom of Bhutan as 208th Member Federation*, SwimSwam (June 10, 2017), https://swimswam.com/fina-announces-kingdom-of-bhutan-as-208th-member-federation/ [https://perma.cc/66ZV-ABHC].

[169] *FINA President Signs Two Pioneering Agreements with Bhutan and South Africa*, World Aquatics (June 24, 2021), https://www.worldaquatics.com/news/2178105/fina-president-signs-two-pioneering-agreements-with-bhutan-and-south-africa [https://perma.cc/CW6U-7YDT].

[170] Charlotte Wells, *Bhutan Opens Nation's First Ever Competition Swimming Pool: World's Highest*, SwimSwam (May 18, 2024), https://swimswam.com/bhutan-opens-nations-first-ever-competition-swimming-pool-worlds-highest/ [https://perma.cc/S3YC-UX3D].

The unavoidable costs of participating in competitive swimming—and, for that matter, in any sport—already create an uneven playing field. Swimmers must be able to spend to participate and be competitive; those who are unable to spend are unable to compete.[171] This unfortunate reality is exacerbated by the Ban's permission of tech suits, which are virtually necessary and therefore represent an additional unavoidable cost for elite athletes. Thus, the Ban both largely evened the playing field for swimmers with sponsorships and perpetuated an uneven playing field for anyone unable to afford the best suits.

B. Returning to Swimming Tradition, but Not Really

The Ban was a partial success in returning swimming to its roots. With no more full-body polyurethane suits, performance outcomes became more dependent on swimmers' personal attributes rather than the particular suit they wore. So too did races become more of a challenge as the suits did less work for the swimmers. Six-time Olympic medalist Matt Grevers commented prior to the Plastic Games: "[W]hen we roll back [on full-body suits], racers are going to hurt a lot more than they hurt currently[.]"[172] The Ban also stymied any chance of a faster material than polyurethane being introduced to the sport and corrupting swimming tradition more than polyurethane had.

The Ban failed to level the playing field, however, in that the post-Ban tech suits are still performance-enhancing, albeit less so than the LZR, X-Glide or Hydrofoil. While polyurethane was especially effective, it was not the only mechanism tech suits possessed to improve swimmers' speed. After all, the original Fastskin did not have polyurethane and it still changed the face of swimming. Today's tech suits continue to be extremely tight-fitting, and the compression provides the same benefits that it always did, just to a lesser extent.[173]

The means by which W.A. established the legality of tech suits post-2010 is curious. Similar to the former Rule 10.7, W.A. Competition Regulations Rule 15.3 now states: "No swimmer shall be permitted to use or wear any device or swimsuit that may aid his/her speed, buoyancy or endurance during a competition."[174] Dating back to 2000, manufacturers and their

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[171] Unavoidable disparities in swimming include access to a pool, as illustrated by the Bhutan example.

[172] Crouse, *supra* note 3.

[173] Morales, Fajardo & González-García, *supra* note 23 ("Body compression has been considered to be the main cause of the improvement in performance.").

[174] World Aquatics, *supra* note 2 pt. 2, art. 15.3.

sponsored athletes were careful to present the first tech suits as "optimizing" athletes' performances, but not "enhancing" them.[175] According to this view, tech suits only manage existing forces instead of creating new ones;[176] in other words, tech suits do not make athletes faster by themselves, they merely reduce drag affecting the swimmer.[177] This view ignores the significant body of scientific evidence that shows that compression alone improves swimmers' endurance.[178] Even without scientific evidence, 'managing existing forces' seems to be a prima facie means of "aid[ing] speed" under W.A. Competition Regulations Rule 15.3. In a sport characterized by its high-drag environment, reducing drag necessarily enhances performance.

Perpetuating this counterintuitive view may have been necessary, though. If FINA had enacted a full ban on tech suits, such that men returned to competing in briefs, many swim records may never have been broken. As it is, with the Ban limiting tech suits' effectiveness but not eliminating tech suits altogether, one women's record set in a full-body tech suit remains unbroken, while six men's records persist, including Biedermann's 200 meter freestyle at the Plastic Games.[179] Allowing tech suits to remain legal in the sport preserved the dimension of elite swimming in which athletes are motivated by the pursuit of making swimming history. Then again, FINA could have opted to

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[175] Magdalinski, *supra* note 19, at 1 ("In 2000, after trialling a 'fastskin' for Adidas, Ian Thorpe announced to a press conference that the new full-length swimsuit certainly 'optimised' his performance but carefully pointed out that it did not 'enhance' it."). Although there is only circumstantial proof of this, Speedo's decision to name its first tech suit the "Fastskin" suggests it was trying to emphasize its suit was simply an improved version of human skin, and not an unnatural performance-enhancer.

[176] Bryce Dyer, *The Controversy of Sports Technology: A Systematic Review*, 4 SpringerPlus 524, 531 (2015) ("[A] defence was provided by Speedo that suggested the suit only improved the management of existing forces rather generating new ones.").

[177] Swimmers struggled at times to convey this message. For example, seven-time Olympic medalist and Speedo-sponsored Grant Hackett said that athletes deserve the credit for their performances, not the LZR, but moments later contradicted himself: "Of course, the suit contributes to performance." *Swimmers Might Have to Choose Between Sponsor or Faster Speedo*, *supra* note 56.

[178] *See* Morales, Fajardo & González-García, *supra* note 23 (detailing studies conducted between 2001 and 2014 analyzing tech suits' effect).

[179] World Aquatics tracks 20 events swum in Olympic size pools for each gender. *Women Freestyle World Records*, World Aquatics, https://www.worldaquatics.com/swimming/records?recordCode=WR&eventTypeId=&region=&countryId=&gender=F&pool=LCM [https://perma.cc/5NYE-Q6ZD] (last visited Oct. 26, 2024); *Men Freestyle World Records*, World Aquatics, https://www.worldaquatics.com/swimming/records?recordCode=WR&eventTypeId=&region=&countryId=&gender=M&pool=LCM [https://perma.cc/5KEW-APQ3] (last visited Jan. 10, 2026).

enact a full ban and wipe its record books clean,[180] or used some other means of differentiating records set in full-body tech suits.

While some records set in full-body tech suits remain unbroken, the majority have been eclipsed. That fact is a curiosity. The discrepancy between the single remaining women's record and the six unbroken men's records is most easily explained by how the Ban allowed tech suits to continue to cover female athletes' bodies much more than their male peers. As a result, the Ban reduced tech suits' effectiveness more for male athletes. However, even in the men's record book, the majority of records set in full-body tech suits have been broken.

This, in turn, calls into question how such a feat is possible. Perhaps athletes and athletic training have improved such that they can now outcompete their 'supersuited' predecessors. While generational talents like Katie Ledecky have emerged post-2009, this explanation alone is insufficient. Michael Phelps, for example, is another generational talent who set world records on thirty-nine occasions during his career,[181] yet he is no longer an individual record-holder despite having competed in a suit that put him at a marked advantage relative to competitors today.

The more likely explanation for this phenomenon is that, although suits are now less performance-enhancing than in the 2000s, other forms of performance-enhancing technology in swimming have bridged the performance gap.[182] The years immediately following the Ban saw the lowest rates of world

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[180] *Cf.* After a new javelin was introduced in the 1980s, the sport of javelin successfully restarted its record book. Tucker & Dugas, *supra* note 18. Some advocated for this approach in swimming. *See* Crouse, *supra* note 3 ("Mark Schubert, the general manager of the United States national team, . . . said the records should be stricken because they were artificially aided.").

[181] *Most World Records Set for Swimming (Male)*, Guinness World Records, https://www.guinnessworldrecords.com/world-records/63391-most-world-records-held-for-swimming-males [https://perma.cc/K8T7-TXD6] (last visited Oct. 26, 2024).

[182] For example, since 2009, FINA has approved a wedge to improve backstroke starts, increased mandatory pool depth, and legalized wearable technology. Jess Geriane, *A History of the Backstroke Start and Backstroke Wedge*, Swimming World (Oct. 19, 2023, 08:31), https://www.swimmingworldmagazine.com/news/a-history-of-the-backstroke-start-and-backstroke-wedge/ [https://perma.cc/P9DA-DGTD]; Natalie Venegas, *Is Olympics Swimming Pool Too Shallow for World Records?*, Newsweek (July 31, 2024, 18:08 ET), https://www.newsweek.com/olympics-swimming-pool-too-shallow-world-records-1932665 [https://perma.cc/CJM4-C8MK]; Mel Stewart, *FINA to Allow Wearable Technology in Races Starting Jan 1st 2023*, SwimSwam (Oct. 16, 2022), https://swimswam.com/fina-to-allow-wearable-technology-in-races-starting-jan-1st-2023/ [https://perma.cc/CNE2-HYSQ].

record performances in history.[183] Given the importance of new world records to awareness and excitement about the sport, W.A. was incentivized to increase the use of performance-enhancing technology, not to lessen it, post-2009. Although there is no similar outcry today about technology's impact on swimming, top swimmers now generally outcompete those from 2008 and 2009—an era where there was concern about whether the sport was really 'swimming' at all.

C. The Market Persists

The Ban allowed for the tech suit market's status quo to persist. Although manufacturers were unhappy with the Ban, it allowed them to continue innovating and, more importantly, selling tech suits for hundreds of dollars each.[184] This was also desirable for professional swimmers and SGBs, who continued to receive sponsorships from suit manufacturers.[185] In 2011, Speedo unveiled its newest post-Ban offering, the "Fastskin3 Racing System," which included a tech suit, goggles and a cap.[186] Prices ranged from $40 for the cap to $560 for the women's suit.[187] From a tech suit market perspective, little changed.

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[183] Elan Ness-Cohn, *Disruptive Sports Tech: Exploratory Analysis of Swim World Record Data*, Nw. Univ. (July 3, 2019), https://sites.northwestern.edu/elanness-cohn/2019/07/03/disruptive-sports-tech-exploratory-analysis-of-swim-world-record-data/ [https://perma.cc/955V-K5VL].

[184] *See, e.g.*, Associated Press, *Speedo Says Decision Could Hurt Sport*, ESPN (July 24, 2009, 18:48 ET), https://www.espn.com/olympics/swimming/news/story?id=4356078 [https://perma.cc/UB3X-GUU8] (quoting Speedo's statement regarding the Ban: "Any move which seems to take the sport back two decades -- such as a possible return to the traditional female swimsuit and male jammer -- is a retrograde step that could be detrimental to the future of swimming."); Purdue University, *Full Video Interview | Jan-Anders Mansson, Exec. Director of the Ray Ewry Sports Engineering Center*, YouTube (July 25, 2024), https://www.youtube.com/watch?v=fn3PTpcBzK0 [https://perma.cc/66MM-TT4T] (where Dr. Mansson states that "there were a lot of companies that did not like [the Ban].").

[185] These sponsorships created, and continue to create, a conflict of interest for FINA and national SGBs. Suit manufacturers give money to SGBs and, perhaps not coincidentally, FINA's decision kept suit manufacturers' revenue streams intact. As an international SGB, FINA is vulnerable to the same potential for corruption as larger SGBs like FIFA, though there is no proof of corruption directly relating to the Ban.

[186] Warnaco Group, Annual Report (Form 10-K) (Feb. 15, 2011).

[187] Jean E. Palmieri, *Speedo's New Weapon: Fastskin3 Racing System*, Women's Wear Daily (Dec. 1, 2011, 00:01), https://wwd.com/feature/speedos-new-weapon-fastskin3-racing-system-5404134-765695/ [https://perma.cc/RYW2-YEED].

It is unclear whether maintaining the tech suit market was necessary, though. Some argued that banning tech suits altogether would cripple the sport of swimming because manufacturers' investment in the sport would dry up.[188] However, from 1896 through 1996, tech suits did not exist. It is much more challenging to argue that swimming could not function without the tech suit market when a century of evidence shows otherwise. Moreover, tech suits did not make up an essential revenue stream for suit manufacturers,[189] and completely banning the tech suits could have simply pressured manufacturers to innovate swimming products outside of suits.[190]

D. Public Interest in Swimming

There may not be a strong correlation between the rate at which world records are set and swimming's popularity. Post-Ban, the opposite proved true: between 2010 and 2017, for example, USA Swimming's membership increased by twenty percent,[191] despite fewer world records being broken during this time than ever in the history of the sport.[192] Thus, despite the belief that world records are important for driving interest in swimming, their impact may be overstated.[193]

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[188] *See, e.g.*, Tucker & Dugas, *supra* note 41 ("I believe that for FINA to ban the suits outright would drive a stake through the commercial heart of the swimming world. . . . [W]hy would a swimsuit manufacturer even consider a sponsorship of an individual swimmer (or a national federation) when all suits are the same and as basic as possible? Answer - they wouldn't."); Craik, *supra* note 26 at 77 ("[T]he health and wealth of the sport of swimming is inter-linked with the fortunes of the swimwear industry.").

[189] Naughton, *supra* note 58 ("LZR Racer is a pretty small part of our business, under 5 percent.").

[190] For example, even with the partial ban, Speedo incorporated goggles and caps into its Fastskin3 line, creating "the world's first Racing System, engineering cap, goggles and suit to work in harmony." *Fastskin3 Elite Mirrored Goggle*, Speedo, https://us.speedo.com/fastskin3-elite-mirrored-goggle/13236166.html [https://perma.cc/2CUM-2LGJ] (last visited Oct. 26, 2024).

[191] 2021 Membership Demographics Report, *supra* note 145.

[192] Ness-Cohn, *supra* note 183.

[193] Granted, USA Swimming's membership figures are just one of many possible metrics for measuring swimming's popularity. Another valuable metric, Olympic swimming viewership, is not publicly available.

Conclusion

Swimming is not baseball, hockey, or tennis. Technology is an essential element of those sports. Swimming, as much as it may employ technology, is not so similarly reliant. Whereas there can be no baseball without a bat, there can be swimming without any form of technology involved. At its root, swimming is a competition of human versus water. As swimming incorporates new technology, then, so too does it stray further from its tradition.

The use of technology in swimming itself does not risk a crisis of legitimacy within the sport, however. Since its Olympic debut in 1896, swimming has evolved to incorporate pools, starting blocks, lane lines, and goggles, to name only a few examples. These technologies impacted the sport in a variety of ways yet did not call into question the legitimacy of swim competition.

However, swimming's evolution between 1999 and 2009—and, particularly, the crisis from 2008 to 2009—animated such questions over legitimacy. Over the course of a decade, swimming became a sport that no longer resembled traditional, more 'pure' conceptions of swimming. Through the use of full-body tech suits, so much performance-enhancing technology was adopted by the sport that swimming itself became unrecognizable and, in the eyes of many, illegitimate. The 2008–09 crisis evinced how the scope of permissible technological innovation in swimming is finite: there must be limit to performance-enhancing technology in swimming. Given its tradition as a sport that is not reliant on technology, the existence of such a ceiling makes sense.

In its role as the regulator of technology in swimming, W.A. must balance several interests. To satisfy its sponsors, keep itself liquid, and make way for new world records, W.A. must allow for new technologies to enter the sport. But, in order to keep swimming true to its tradition, W.A. cannot do so indefinitely.

These conflicting interests place W.A. in an unsustainable position. For the moment, W.A. appears poised to continue allowing new technologies, albeit in an incremental fashion. Nevertheless, there is a finite amount of performance-enhancing innovation that can occur outside of suits. If the superior aim is for new world records to be achieved regularly, there will come a time when the pursuit of world records will require rewriting the Ban to allow for the reintroduction of full-body tech suits. The problem with this outcome has already been demonstrated by the full-body tech suit saga of the 2000s.

Full-body tech suits are a proven step too far, yet W.A.'s incremental management strategy threatens to steer swimming back in that very direction.[194]

There are three crucial takeaways that can be extrapolated from the full-body tech-suit case study. First, for sports that are traditionally viewed as not relying on technology, the regulation of new technology is necessary. Athletes and manufacturers alike are incentivized to achieve the highest possible performance through the use of technology, and SGBs must act as a regulator to prevent their sport(s) from evolving in undesirable ways. Second, for these sports, there is an upper boundary to the acceptable amount of performance-enhancing technology involved. Although this ceiling is subjective, the 2008–09 crisis evinces how swimming can accept only a finite amount of performance-enhancing technology before the community for the sport revolts.

Third, SGBs must develop a technology-regulation strategy that underpins their long-term vision for their sport(s). Without a more purposeful direction in their sports' evolutions, SGBs' regulation of new technology risks steering their sports in directions untethered from their roots, as was the case with FINA and full-body tech suits. W.A. need not necessarily freeze all approvals of new technology, but the future of swimming cannot be a hyper-technological sport.[195] Absent a more purposeful technology-regulation strategy by W.A., swimming is poised to return to troubled waters.

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[194] Even if the reintroduction of full-body tech suits went smoothly, it would be no more than a short-term fix to the problem W.A. faces. The only way to ensure world records regularly fall is to continually add new performance-enhancing technology, and something else would need to come after full-body tech suits.

[195] To be sure, W.A. could freeze all new technology approvals. Although world record progression would stagnate, this appears inevitable. However, this is not the approach this Article argues for (nor is there any particular approach this Article argues for). Additionally, a complete freeze is not likely economically feasible for W.A. One could imagine alternative scenarios where, for example, W.A. creates two levels of competition, one with tech suits banned in their entirety and another with full-body tech suits allowed. Powerlifting uses such an approach, where "raw" and "equipped" competitions have separate record books.