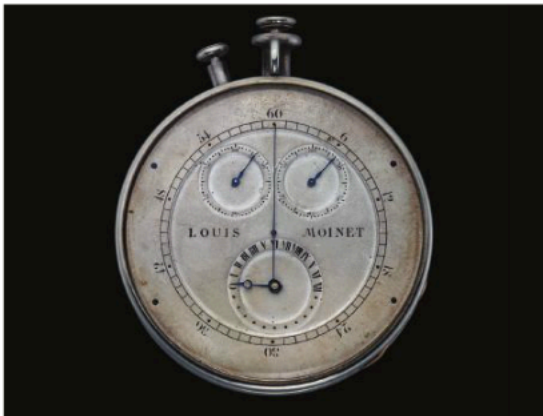


## A Brief History of Timekeeping

Stopwatches, pace clocks, and waterproof watches have all added urgency to the sport of swimming



Invented in 1816, Louis Moinet's chronograph was the world's first stopwatch and a revolution in timekeeping.

Louis Moinet

For much of human history, time has largely been measured by the movement of celestial bodies. These nonstandardized timekeepers alter their trajectories as our own planet spins through the seasons, unencumbered by the arbitrary constrictions of mankind. Days, weeks, months, and years were relatively easy to track, but seconds, minutes, even hours could be harder to pin down.

Clever humans eventually figured out how to build mechanical clocks, which revolutionized our concept of time. These clocks—powered by water at first and by pendulums and complex machinery later—turned time into something that could be measured on a much smaller scale and used for a variety of applications.

Building on this knowledge, around 1695, master horologist Samuel Watson designed a prototype stopwatch for English physician Sir John Floyer to aid in measuring patients' pulse rates. Watson's device could measure down to one-fifth of a second, and a stopper could pause the clock's motion, thus "capturing" time.

From there, the sky was the limit. A need for more accurate mapping of planetary orbits led to the development of the first fully fledged stopwatch. Invented in 1816 by Louis Moinet, a watchmaker and artist from Bourges, France, this sophisticated chronograph—which comes from the Greek words "chronos," or time, and "graph," or writing—was dubbed the *compteur de tierces*, meaning "counter in thirds." The most precise timekeeper yet invented, its internal mechanism vibrated 216,000 times per hour, good for measuring one-sixtieth of a second.

But Moinet's invention was lost to posterity for decades because Moinet apparently didn't realize its commercial potential. Until 2013, credit for developing the first stopwatch had been given to Nicolas Mathieu Rieussec of France, who in 1821 created a stopwatch with accuracy to one-tenth of a second to support King Louis XVIII's horse-racing habit. A commercial success, Rieussec's watch helped usher in a new era of sports racing, one in which records could be kept and swimmers such as Michael Phelps could triumph by the narrowest of margins. (In 1916, TAG Heuer introduced its Mikrograph, which

could measure to one one-hundredth of a second, the difference between first and second place in the stunning 100-meter butterfly that Phelps won against Milorad Cavic at the 2008 Olympics.)

Stopwatches made it easy for officials and coaches to monitor swimmers' times as racing became more formalized toward the end of the 19th century, but for the swimmers themselves, tracking time from in the water would remain a challenge until the invention of the pace clock in 1946. Credited to Australian Olympic swimmer and coach Forbes Carlile, the invention of the pace clock aided his development of innovative heart-rate training techniques and helped swimmers keep track of complicated interval sets. From the end of World War II on, Carlile's swimmers at the Palm Beach rock pool and the North Sydney pool benefited from the simple solution of a large clock with a prominent, sweeping second hand. Visible from the water, these clocks put swimmers in the driver's seat during workouts.

In 1959, American swimmers began benefiting from a similar device. Drawing inspiration from the training techniques and equipment that were helping track and field athletes make impressive gains, legendary swimmer and swim coach James "Doc" Counsilman designed and sold a pace clock similar to the one Carlile developed. These bold clocks quickly became ubiquitous on pool decks around the country, helping push swimmers to new records.

Though pace clocks enabled swimmers to track their time from the pool, there wasn't much of a role for timekeeping for open water swimmers beyond measuring the elapsed time from point to point, until the invention of the waterproof wristwatch. It's unclear who first had the idea of strapping a pocket watch to a wrist to ease time-telling, but *The New York Times* reports that prior to the 20th century, wristwatches were worn exclusively by women and intended "more for decoration than anything as practical as punctuality." However, these devices gained popularity among soldiers and sailors, becoming a necessity during the first World War when troop movements depended on precise timing and soldiers being able to access their timepieces easily. (Pocket watches were not exactly hands-free devices.)

Initially, wristwatches were vulnerable to water and dust infiltration, but in 1926, Rolex debuted the world's first waterproof watch. In an effort to promote this groundbreaking innovation, Rolex's founder, Hans Wilsdorf, gave one of the first Oyster watches to British marathon swimmer Mercedes Gleitze to wear on a highly publicized attempt to swim across the English Channel in 1927.

Although Gleitze didn't reach the shore on that late-October swim (she became hypothermic after more than 10 hours in the sub-58-degree water), the watch survived the ordeal unscathed. Afterward, a reporter noted that "hanging 'round her neck by a riband on this swim, Miss Gleitze carried a small gold watch which was found this evening to have kept good time throughout."

The watch's performance under adverse conditions and Gleitze's endorsement helped catapult Rolex to international timekeeping stardom, and launched a revolution in waterproof timekeeping that has led to the development of sophisticated, wrist-strapped GPS devices that count laps and miles for swimmers in the pool and open water. Today, different celestial bodies than we used previously, i.e., satellites, track us with sublime precision.—ELAINE K. HOWLEY