

# A Mechanical Mélange of Art, Movement, and “Memory”

For many, the word “automaton” resonates with 1950s pulp science fiction or Rod Serling’s *The Twilight Zone*. But for centuries — A.D. — and B.C. — the world of automata was one of high-brow wonder and mystery for folks with disposable income — or royals with too much time on their hands.

Like many words, automaton is Latinized from the Greek, and is usually used to describe non-electronic moving machines. Fittingly, there are many examples of automata in Greek mythology: Hephaestus created automata for his workshop (the first Roomba, maybe?); Talos was an artificial man of bronze; etc.

Automata in the Hellenistic world were intended as toys, religious idols, or tools for demonstrating basic scientific principles, including those built by Greek mathematician Hero of Alexandria (sometimes known as Heron).

It was the dawning of the Renaissance that inspired new interest in automata. Giovanni Fontana created mechanical “devils” and rocket-propelled animal automata. These wondrous devices found a home in the “cabinet of curiosities” or *wunderkammern* of the princely courts of Europe. Hydraulic and pneumatic automata were created for garden grottoes. Absolutely no one should be surprised that Leonardo da Vinci sketched a more complex automaton around the year 1495. The design of Leonardo’s “robot” was not rediscovered until the 1950s.

Moving on, we find a new — if not bizarrely creepy — attitude towards automata attributed to 17th century philosopher Renè Descartes, who held that the bodies of animals are nothing more than complex machines — and that the bones, muscles and organs could be replaced with cogs, pistons and cams.

At any rate, 17th century France was the birthplace of those ingenious mechanical toys that were to become prototypes for the engines of the Indus-

trial Revolution. Indeed, in 1649, when Louis XIV was still in culottes, an artisan named Camus designed for him a miniature coach and horses — complete with footmen, page and a lady within the coach; and all these figures exhibited perfect movement.

And then there is Henri Maillardet, a Swiss mechanic of the 18th century, who worked in London producing clocks and other mechanisms. He designed and built the Draughtsman/Writer — an exquisite toy for adults (please don’t go there; this is a family magazine) around 1800, and it possesses the largest “mechanical memory” of any such machine ever constructed — four drawings and three poems are “his” legacy (two in French, one in English). The mechanism is a perfect example of our desire for not only making things move in a mechanical yet artfully expressed way — but for watching them as well. It is a combination that seems to appeal to many — visually and viscerally. Think hand-cranked motion pictures.

But by the time the poor guy was donated to The Franklin Institute in Philadelphia, it had been virtually destroyed in a fire and hadn’t operated for years. However, an institute machinist began tinkering with the automaton and eventually had it functioning. It was displayed occasionally in The Franklin for the rest of the 1800s.

“The heart of the automaton’s writing and drawing operation is actually a mechanical ‘read only memory’ in the form of an array of disk cams rotating on a common shaft to drive the right hand of the figure,” according to The Franklin Institute website. “The information contained in the undulations of the selected set of cams is picked up by three cam followers linked to the doll’s hand to produce the required left-and-right, up-and-down, and vertical move-

ments. Maillardet’s automaton contains a total of 72 operating cams that control the movements of the right hand. Additional and far simpler cams move the left hand, head and eyes of the doll.”

As recollected by an institute employee in 1928, the “boy” was in a tattered uniform that looked to him to be that of a French soldier. As the boy’s legs were either missing or beyond repair, it was decided for some reason to dress him as an 18th century woman in a long dress. Perhaps the wardrobe switch was just an example of the “French being French,” but in 1826 a lithograph was found, with captions, and voila! — it is proved that the automaton is in fact a boy.

Today, however, he — she — what-



Henri Maillardet’s automaton contains a total of 72 operating cams that control the movements of the right hand. Additional and far simpler cams move the left hand, head and eyes of the doll (photo courtesy The Franklin Institute).

ever — is presented au naturel to better display the inner workings of this mechanical wonder. (*For a richer, online automaton experience, replete with videos, photos, and history, go to [www2.fi.edu](http://www2.fi.edu).*) **PTE**

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(Sources: Wikipedia and The Franklin Institute.)