TWELVE

driving on hydrogen

Honda Motor Company

HONDA FCX FUEL CELL CAR

12 | DRIVING ON HYDROGEN

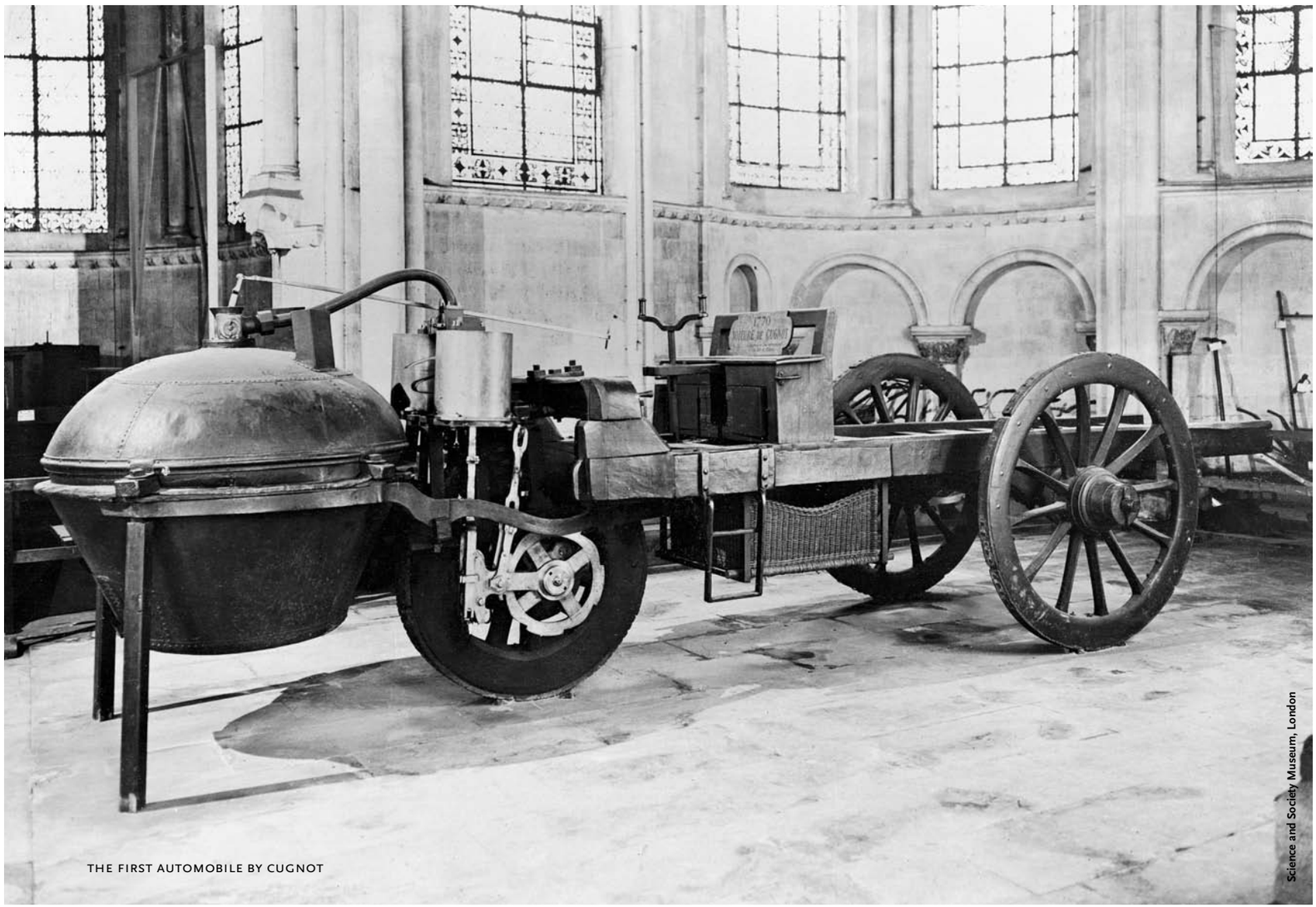
The word "automobile" comes from the French language,

and it is no wonder. France is the place where the automobile was invented. It happened in 1769, the same year that Napoleon Bonaparte was born. The design came from a French military engineer named Nicholas-Joseph Cugnot. It ran on steam and is said to have been able to move a four-ton load while traveling at up to six kilometers per hour.[1] Cugnot went on to improve his automobile in subsequent versions before the French Revolution forced him into exile.

In 1807, Napoleon Bonaparte became France's first emperor. In that same year, another engineering milestone was reached when Swiss inventor Francois Isaac de Rivaz built the world's first working internal combustion [IC] engine. And here's an interesting and little-known fact: the fuel for Rivaz's engine was hydrogen.[2] In 1813, Rivaz actually demonstrated a car that was powered by his engine. Made out of wood, the car weighed a ton and was about twenty feet long. It never ran very well, but it did run.

Beginning around 1890, the race to build a practical automobile really took off. By that time, steam, electricity, and the oil distillate called gasoline were the favored sources of power. In the early part of the twentieth century, only a few scientists were thinking of hydrogen as an automotive fuel. One that took it very seriously was a mechanical engineer from Germany by the name of Rudolph Erren.

In his book *The Forever Fuel,* Peter Hoffmann reports that Rudolph Erren was still in high school when he made his first experiments with hydrogen.[3] In 1926, Erren began a vigorous study of hydrogen as a fuel for the IC engine. Early in the process, he concluded that carburetion was not an effective way to deliver hydrogen to an engine. Erren experimented with



THE FIRST AUTOMOBILE BY CUGNOT

Science and Society Museum, London