

MOBILITIES, TECHNOLOGIES AND SUSTAINABLE DEVELOPMENT

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A Highly Mobile Planet and Its Challenges

Sustainable transportation

A Historical Turning Point

The story of how such vehicles transformed the world begins around 3500 b.c.e., with the invention of the wheel.

The wheel was long assumed to have been invented in Mesopotamia, the region between the Tigris and Euphrates rivers that roughly corresponds with modern Iraq. Known as the cradle of Western civilization, this was where cities and writing first emerged, around 3200–3000 b.c.e., so it was not unreasonable to conclude that wheels originated there, too.

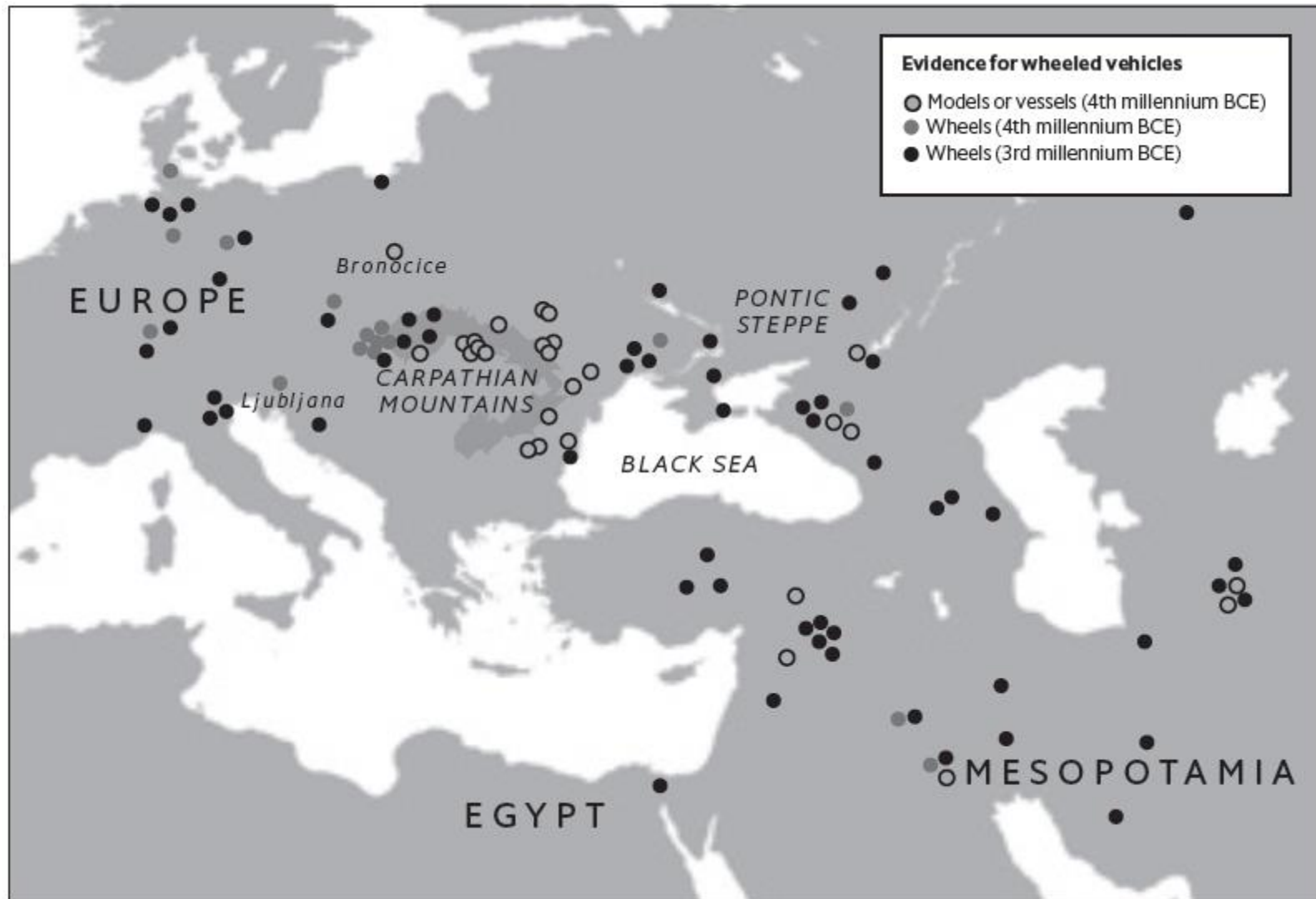
Yet in recent decades carbon-dating evidence has lent support to a competing view: that the wheel emerged in Europe first. The earliest-known wheeled object is a clay model of a bull, mounted on four wheels, found in the Carpathian Mountains of western Ukraine and carbon-dated to 3950–3650 b.c.e., hundreds of years before any sign of wheeled vehicles in Mesopotamia.



The earliest wheels, such as the Ljubljana Marshes Wheel (dated to around 3200 B.C.E.) were made of planks fastened together using batten.



A representation of a four-wheeled vehicle is scratched onto this pot, found in Bronocice in southern Poland and dated to around 3500 B.C.E.



Map showing where the earliest known wheels (and depictions of wheels) have been found, from Europe to Mesopotamia.



Depiction of wheeled vehicles in Mesopotamia, from the Royal Standard of Ur, dated to around 2600 B.C.E.

The Rise and Fall of the Chariot



BATTLE SCENE FROM THE GREAT COURT OF THE RAMESSEUM OF RAMSES II ON THE WALLS OF THE RAMESSEUM.

Pharaoh Rameses II looking heroic in his chariot at the Battle of Kadesh, as depicted in a relief on the walls of the Ramesseum in Thebes, Egypt.



Chariot wheels could be much larger and lighter, which reduced rolling resistance and allowed chariots to achieve unprecedented speeds.

What French scientists predicted the problem of the 20th century, which did not happen?

Who was the first driver and who made the first accident?



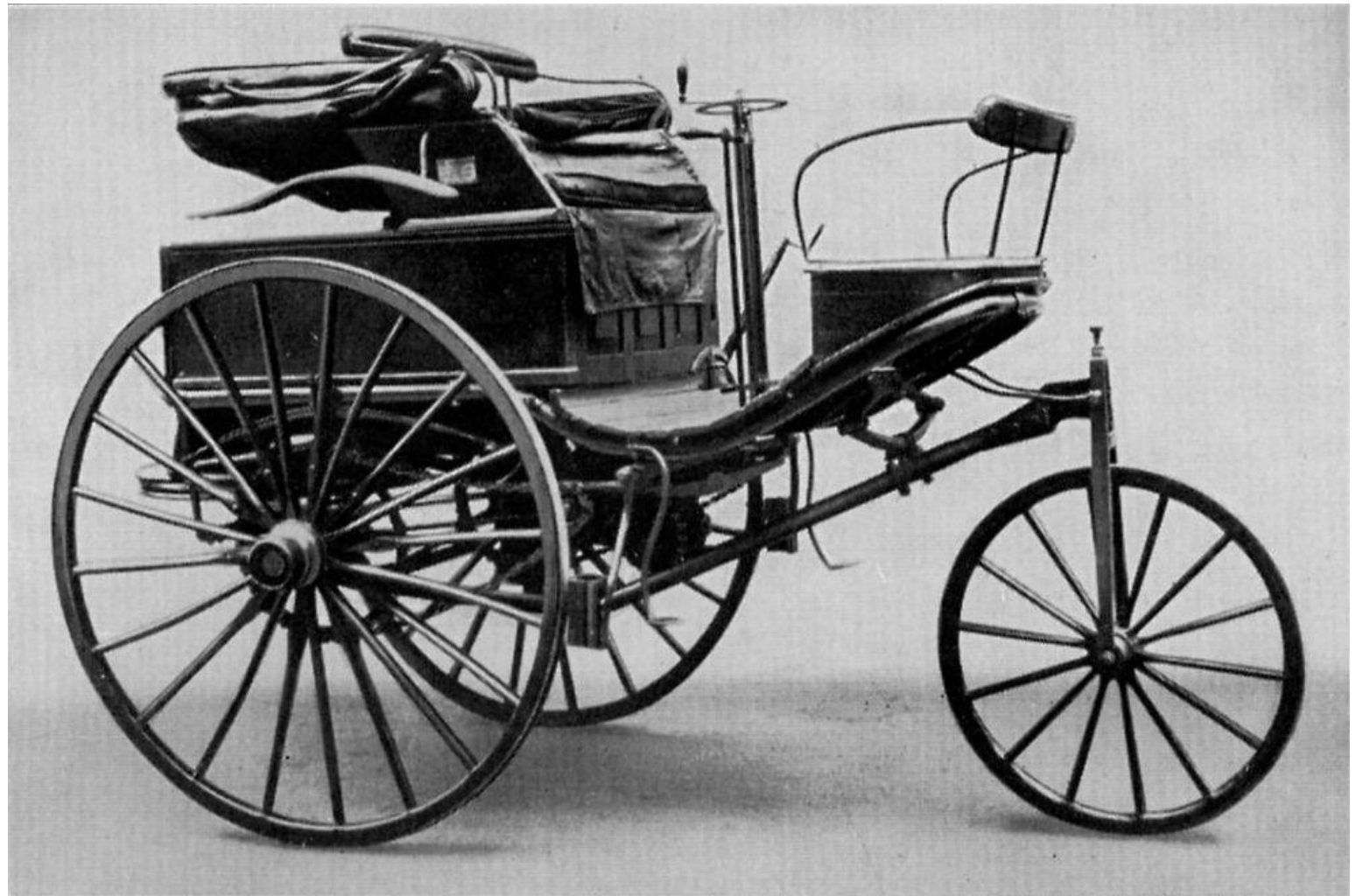
The death of Bridget Driscoll (c. 1851 – 17 August 1896) was the first recorded case of a pedestrian killed in a collision with a motor car in Great Britain. Driscoll, in the company of her teenage daughter May and her friend Elizabeth Murphy, was crossing Dolphin Terrace in the grounds of the Crystal Palace in London when she was struck by a car belonging to the Anglo-French Motor Carriage Company that was being used to give demonstration rides. One witness described the car as travelling at "a reckless pace, in fact, like a fire engine".

Although the car's maximum speed was 8 miles per hour (13 km/h), it had been limited deliberately to 4 miles per hour (6.4 km/h), the speed at which the driver, Arthur James Edsall of Upper Norwood, claimed to have been travelling. His passenger, Alice Standing of Forest Hill, alleged he modified the engine to allow the car to go faster, but another taxicab driver examined the car and said it was incapable of exceeding 4.5 miles per hour (7.2 km/h) because of a low-speed engine belt. The collision happened just a few weeks after a new Act of Parliament had increased the speed limit for cars to 14 miles per hour (23 km/h), from 2 miles per hour in towns and 4 miles per hour in the countryside.

Birth of The Car



Bertha Benz at age 18, circa 1867



The Benz Patent-Motorwagen Number 3 of 1886, used by Bertha Benz for the highly publicized first long distance road trip, 106 km (66 mi), by automobile



On 5 August 1888, 39-year-old Bertha Benz drove from Mannheim to Pforzheim with her sons Richard and Eugen, thirteen and fifteen years old respectively, in a Model III, without telling her husband and without permission of the authorities, thus becoming the first person to drive an automobile a significant distance.

Map of Germany with the Bertha Benz Memorial Route, from Mannheim via Heidelberg and Wiesloch to Pforzheim and back – official heritage path commemorating her journey of 1888



Bertha Benz monument in Wiesloch where she made a stop to take in fuel at the city pharmacy, which is now dubbed "the first filling station in the world"



The world's first "filling station", the City Pharmacy in Wiesloch, Germany



Carl and Bertha Benz 1925



Carl Benz

Benzin – Ligroin



Bertha Benz bought light petrol Ligroin. At that time, ligroin was primarily used to clean clothes (petrol).

„Jerrycan“ (Wehrmacht-Einheitskanister)

USSR



Germany



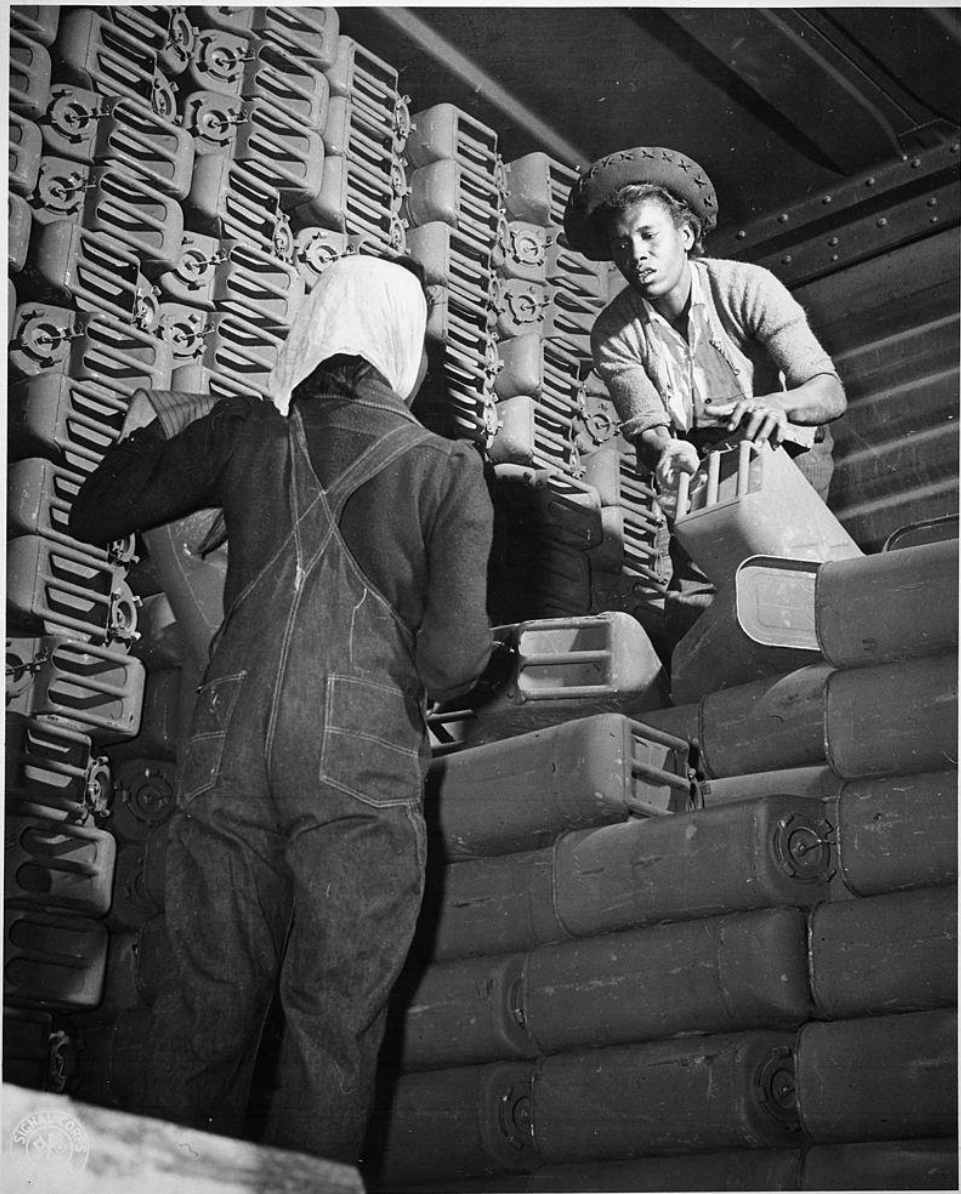
Twenty liter canister



Why so popular?



US-style jerrycans at Savannah Quartermaster Depot, Savannah, Georgia, 1943



British quality





Inexpensive, but weak, with a tendency to leak



British copy of the German design





LI ONE is a full-size hybrid SUV from China with a range of 1000 km

1. Brilliance
2. BYD
3. Changan
4. Chery
5. DFM DW
6. Hower Exeed
7. FAW
8. Foton
9. GAC
10. Geely
11. Great Wall
12. Hafei
13. Haima
14. Haval
15. HTM
16. JAC
17. Lifan
18. Wey
19. Zotye









Thank you for your attention!

