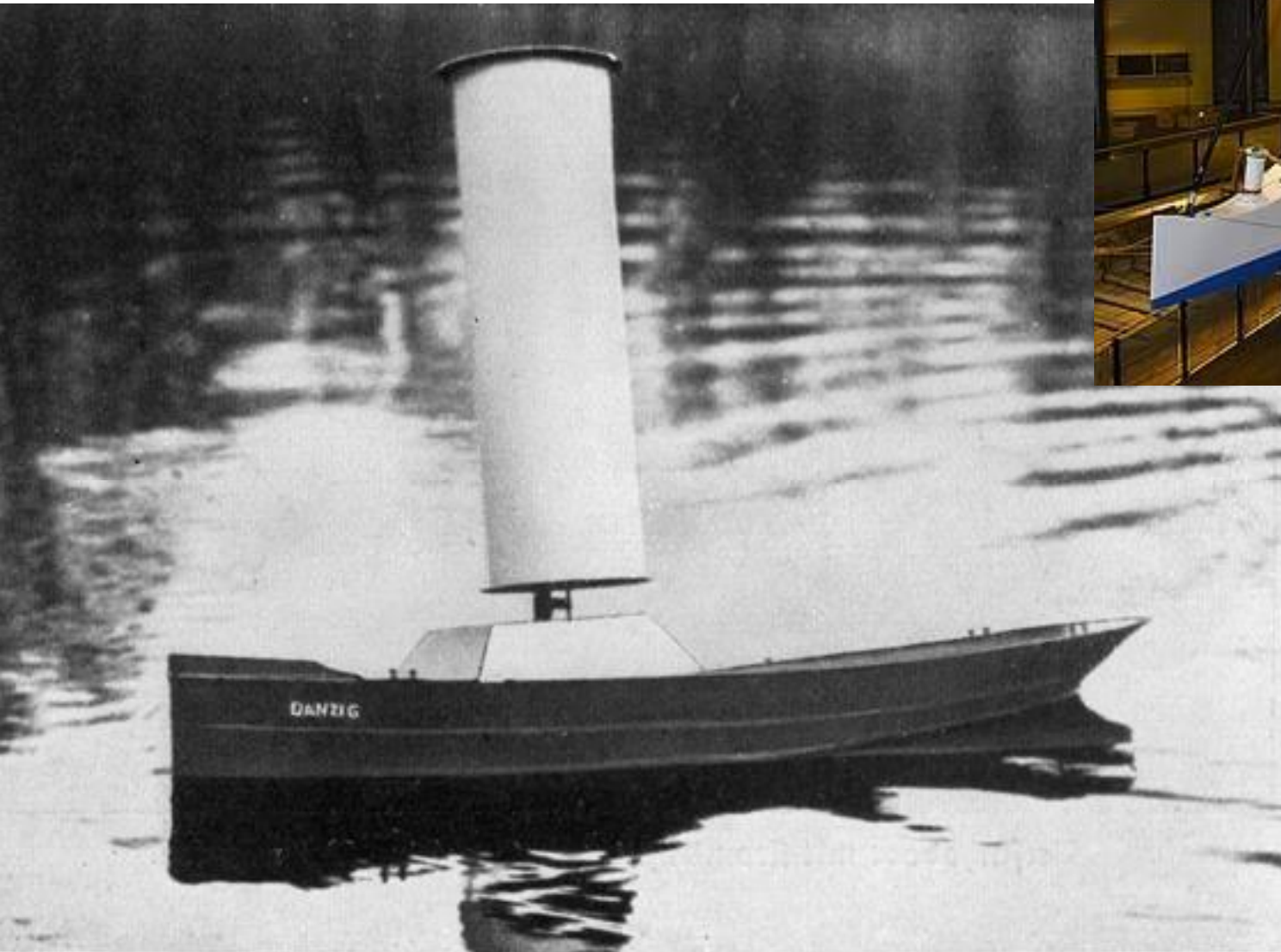
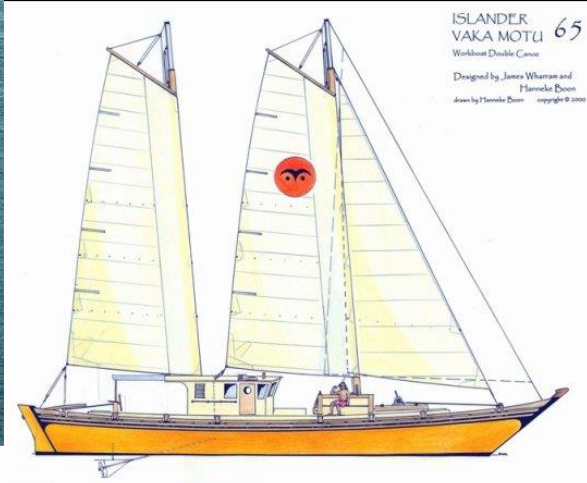


The Magnus Effect and the Flettner Rotor: the potential application for future Oceanic Shipping



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The Magnus Effect and the Flettner Rotor



In which a spinning cylinder past which an external stream is flowing receives a lateral thrust due to the lower pressure on the side of the cylinder where the cylinder's motion is in the same direction as the streaming flow.

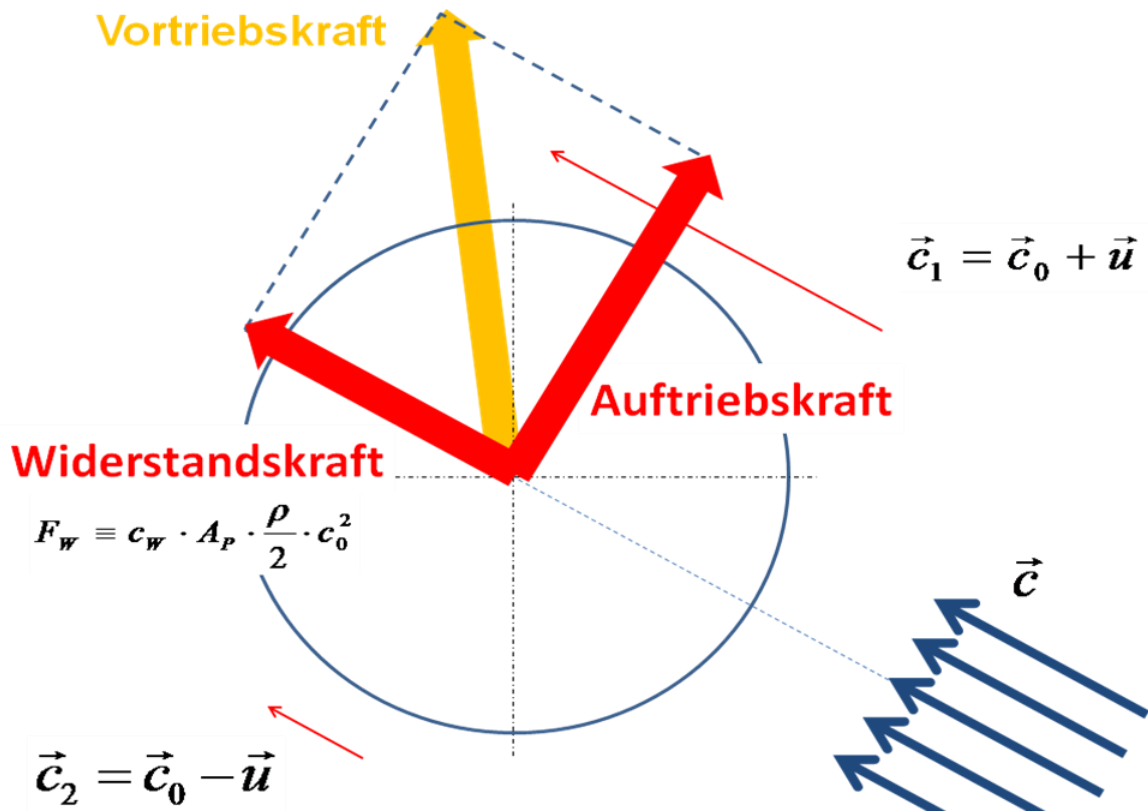
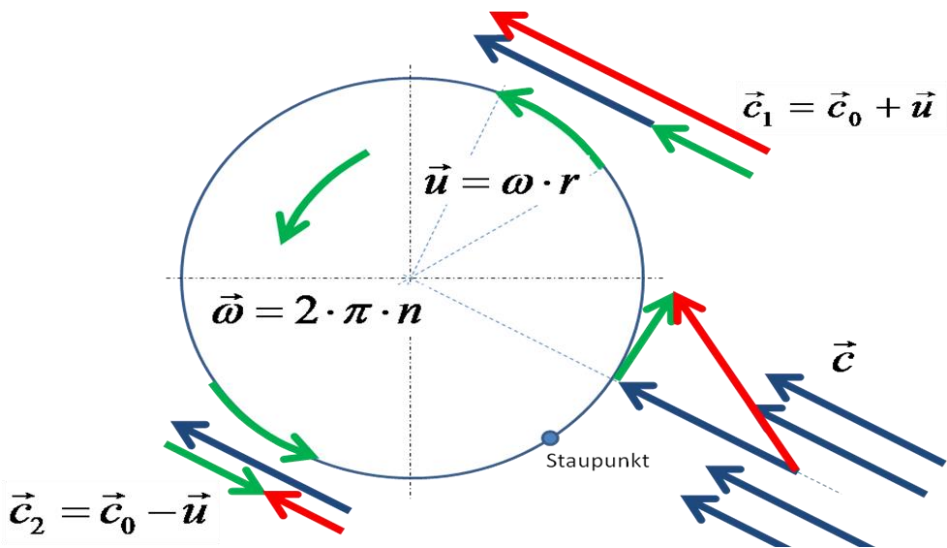


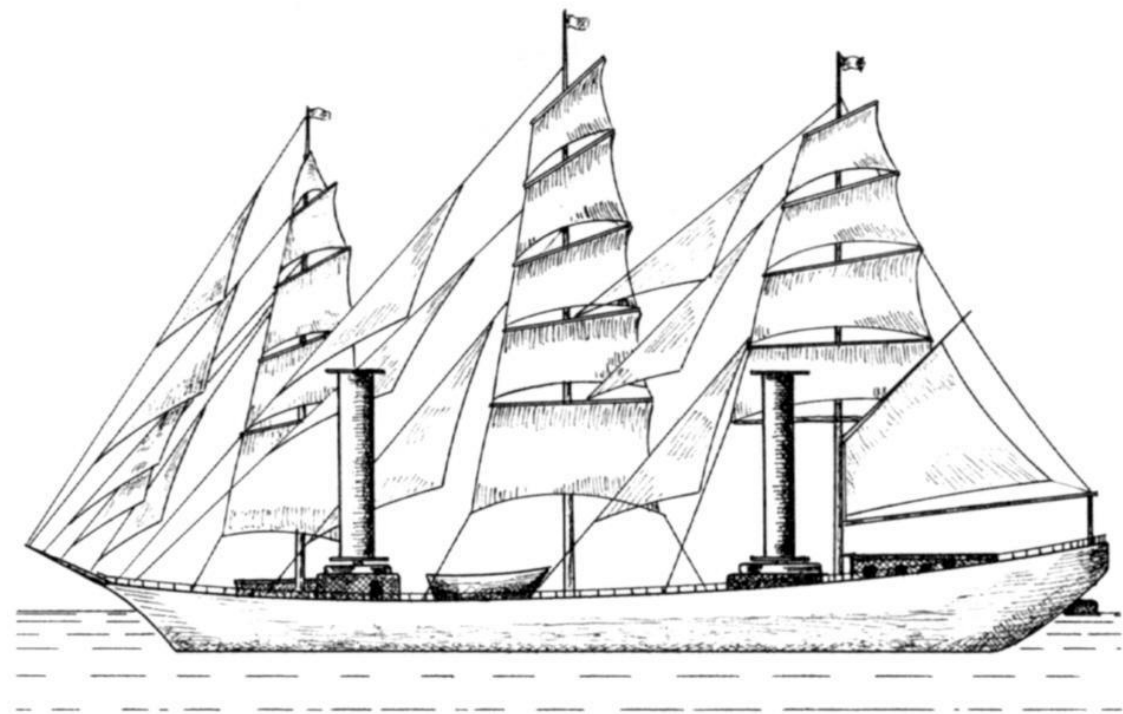
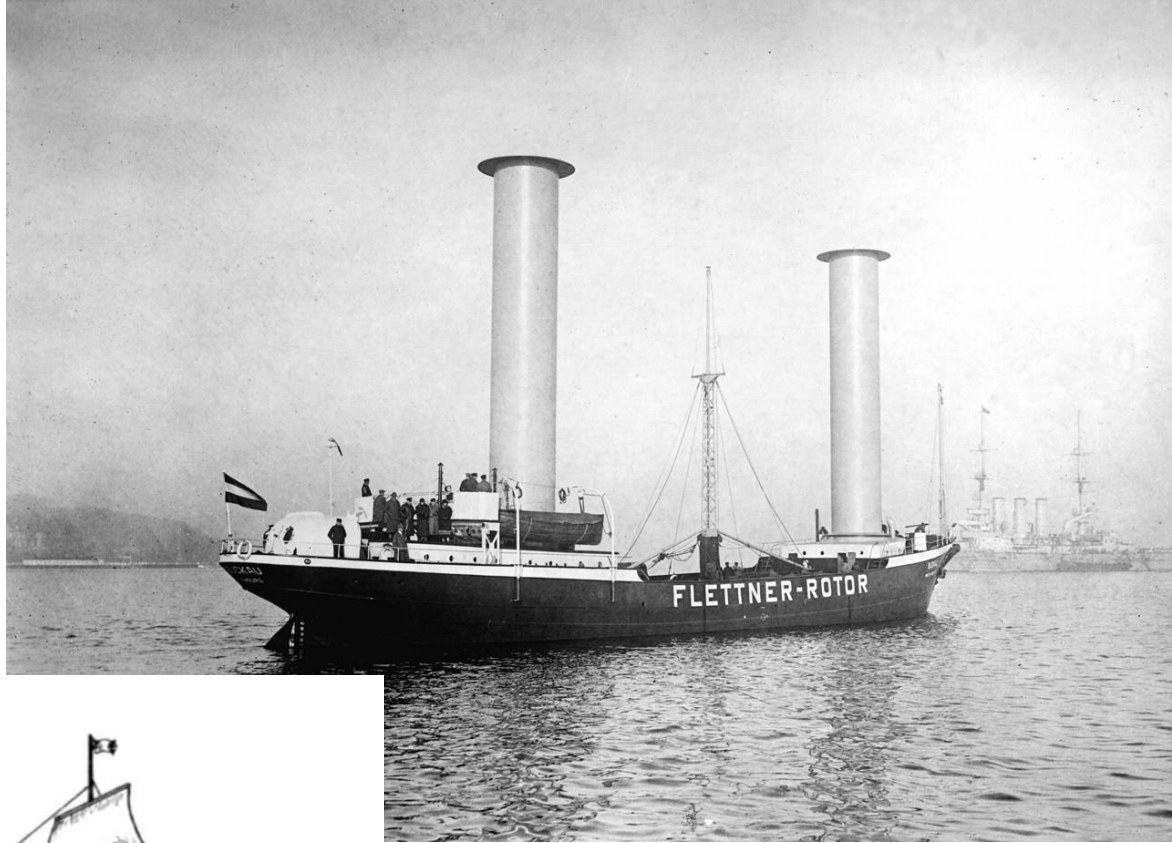
Heinrich Gustav Magnus (1802–1870) discovered a force that arises when air flows over a rotating body now called the Magnus Effect. It is the same effect that allows a baseball to curve in mid air.



A Flettner rotor is a rotating cylinder mounted upright on a ship and was invented by Anton Flettner (1885–1961). In sideways winds, the Magnus force generates a lift on the rotor, propelling the ship forward.





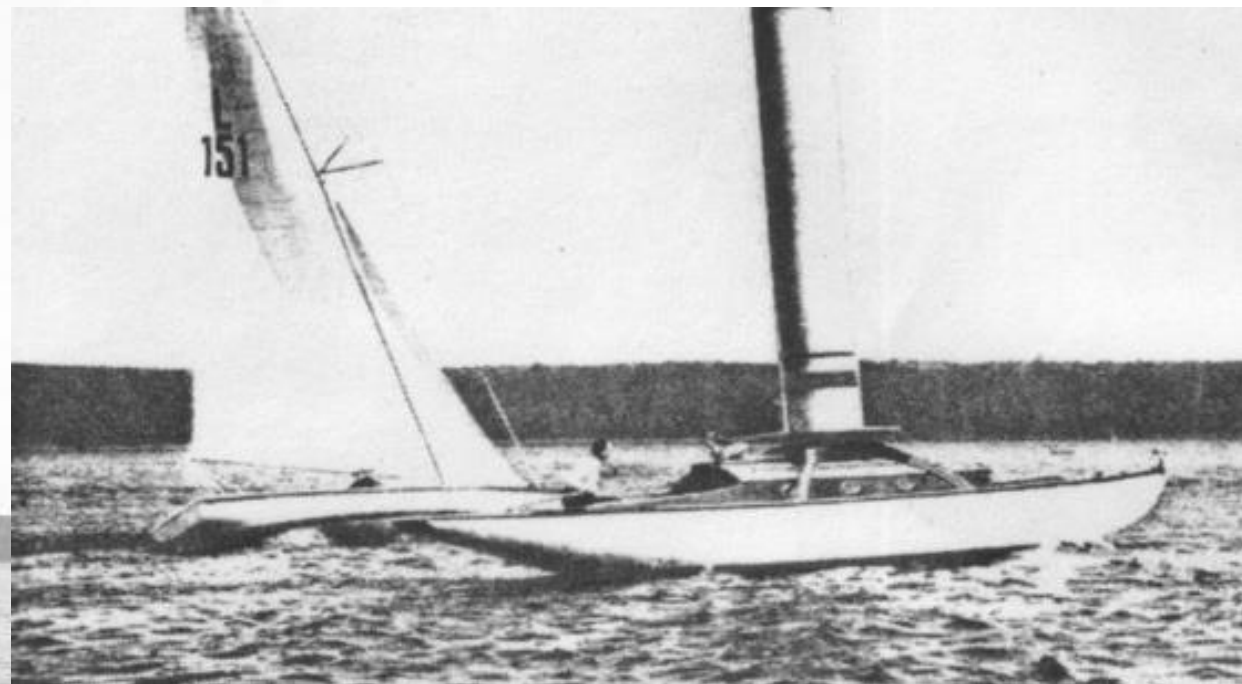
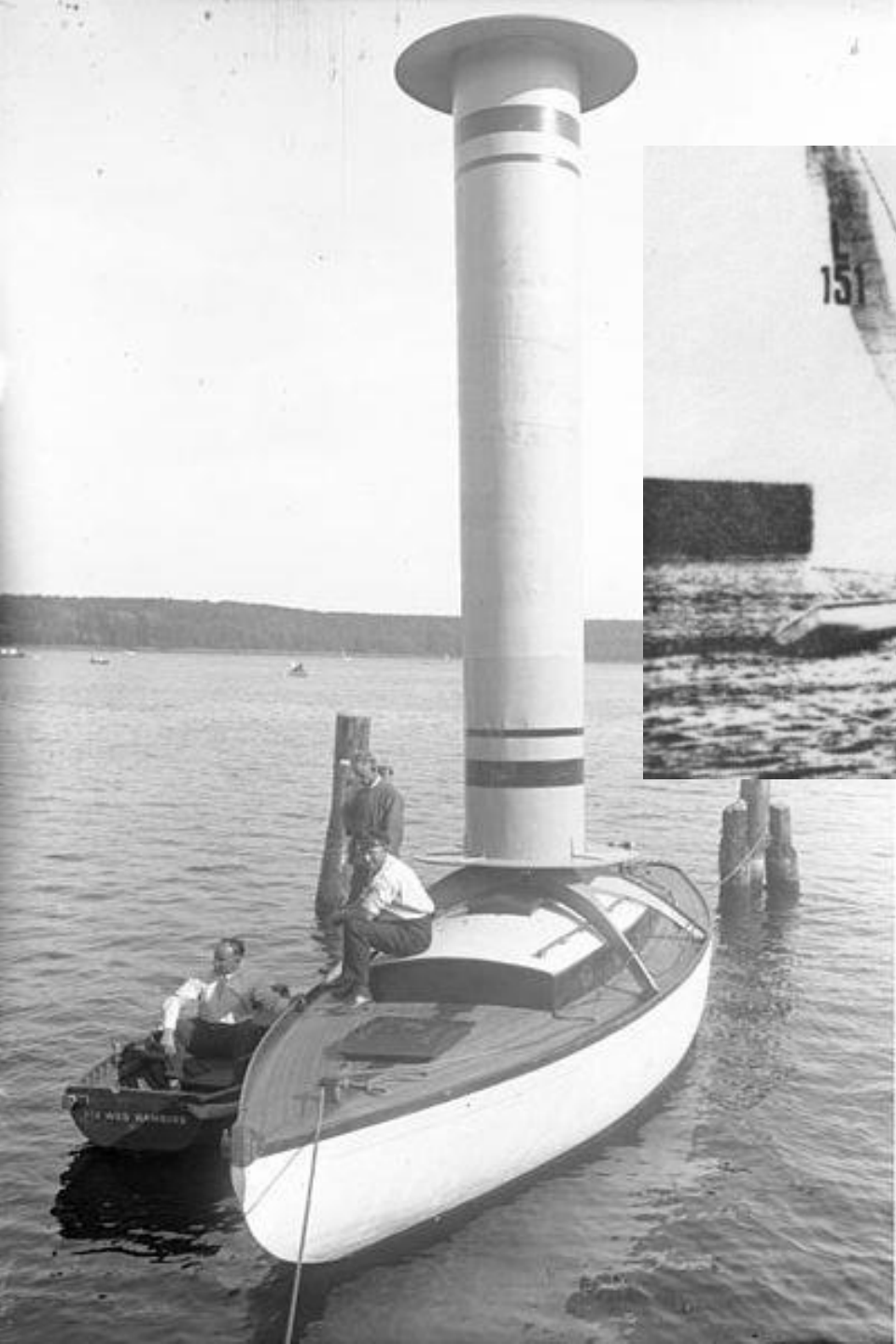


“the schooner Buckau recently put out to sea, a ship without sails or steam. Like a ghost ship it moved mysteriously through the water with no apparent means of propulsion.”

“The astounded spectators on shore knew that the boat was an old 2000-ton steel vessel and that previously 500 square yards of canvas had been needed to propel her.”

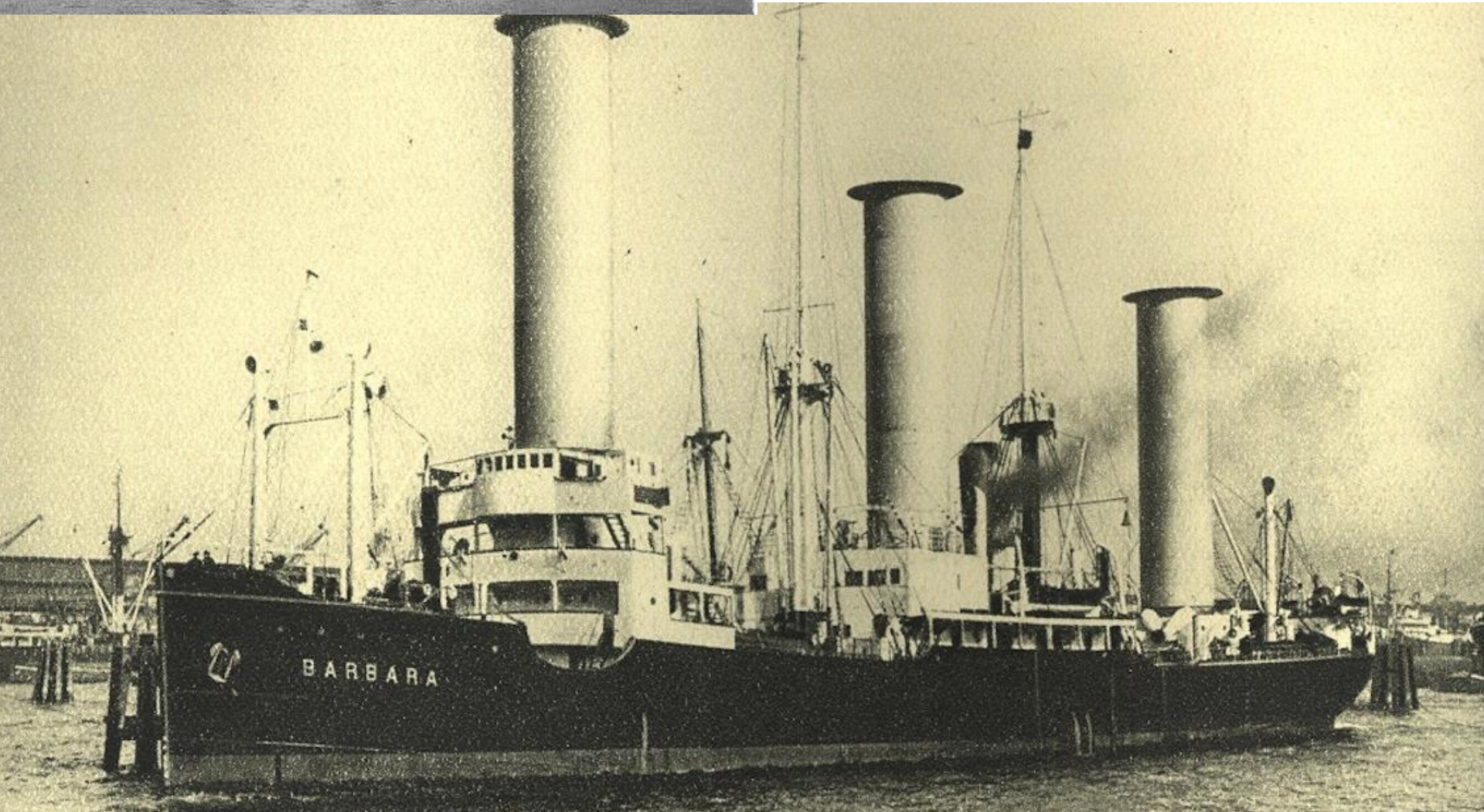
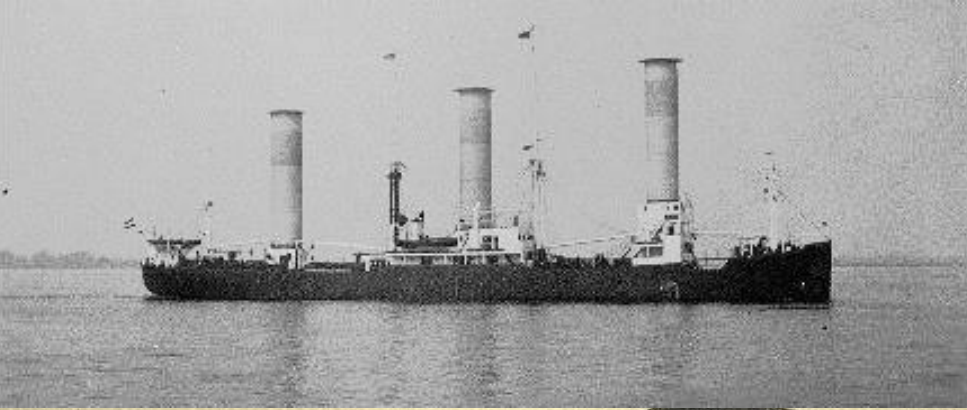
“Two strange cylinders, resembling giant smoke-stacks, rose from her deck. But no smoke was pouring from them and no engine noise was heard. There was no churning of screws. Yet the ship plowed its way through the rough waters of the Baltic, at nearly twice its former speed.”





Bundesarchiv, Bild 102-11748
Foto: o. Ang. / M. 1931

Barbara







www.cousteau.org

Tracker



42', 18 ton motor vessel retrofitted with a Magnus Effect rotor 42" in diameter and 24' high. It is driven up to about 600 rpm by a hydraulic motor which in turn is driven by a hydraulic pump turned by a small gas engine.



Power Mode	Av. Wind Speed (Knots)	Av. Boat Speed (Knots)	Av. Fuel Savings (%)
Rotor Assist	16.1	7.0	44
Rotor Assist	12.9	6.0	27
Rotor Sailing	17.7	5.3	100









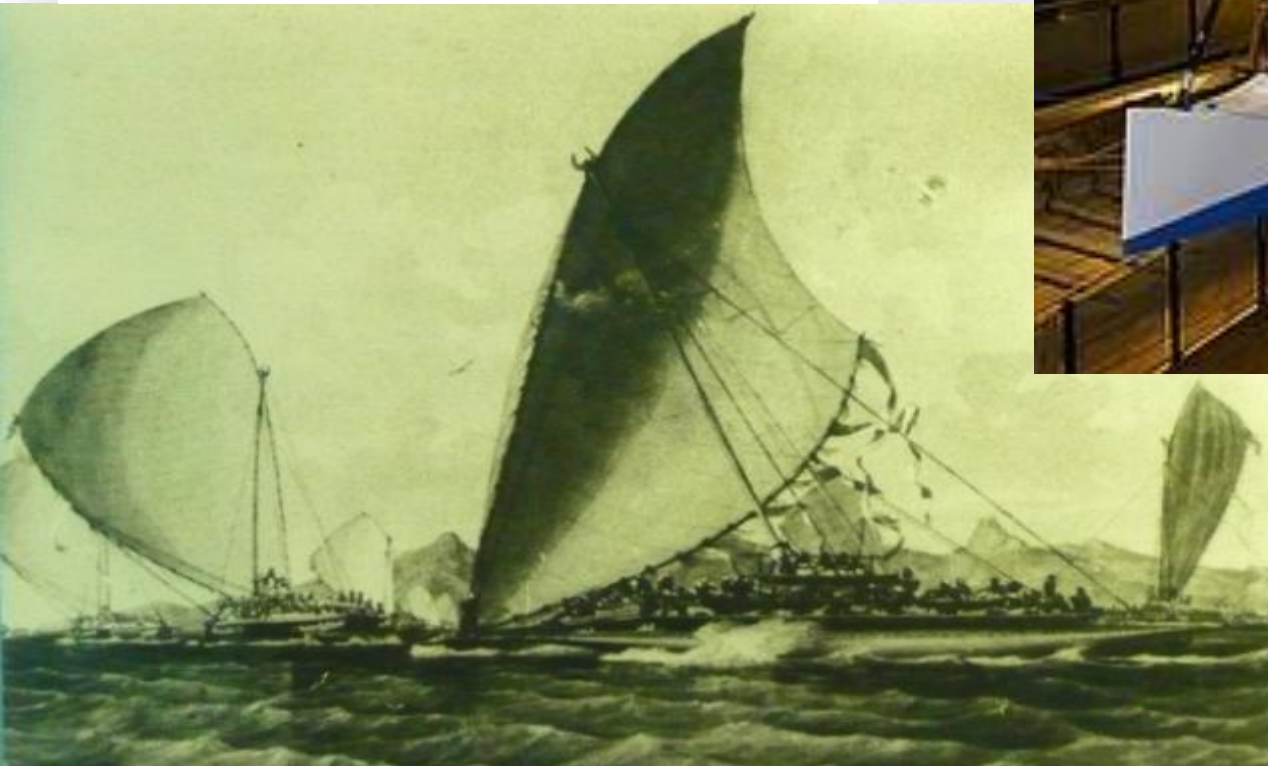


The Flettner Rotor – An Invention Ahead of Its Time?
**Special exhibition in the shipping section of the German Museum of
Technology, SEP 2 February to 1 August 2010**









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