Automotive Systems

- A technical Review of current and future automotive technologies.
- Three major Knowledge systems of Modern Automobiles:
- The vehicle : Chassis, Body, Transmission & braking system etc.
- The Prime Mover: Engines, motors, Hybrids
- The Control systems : EFIS EBS, ETS etc….

AUTOMOTIVE PRIME MOVERS : INTRODUCTION

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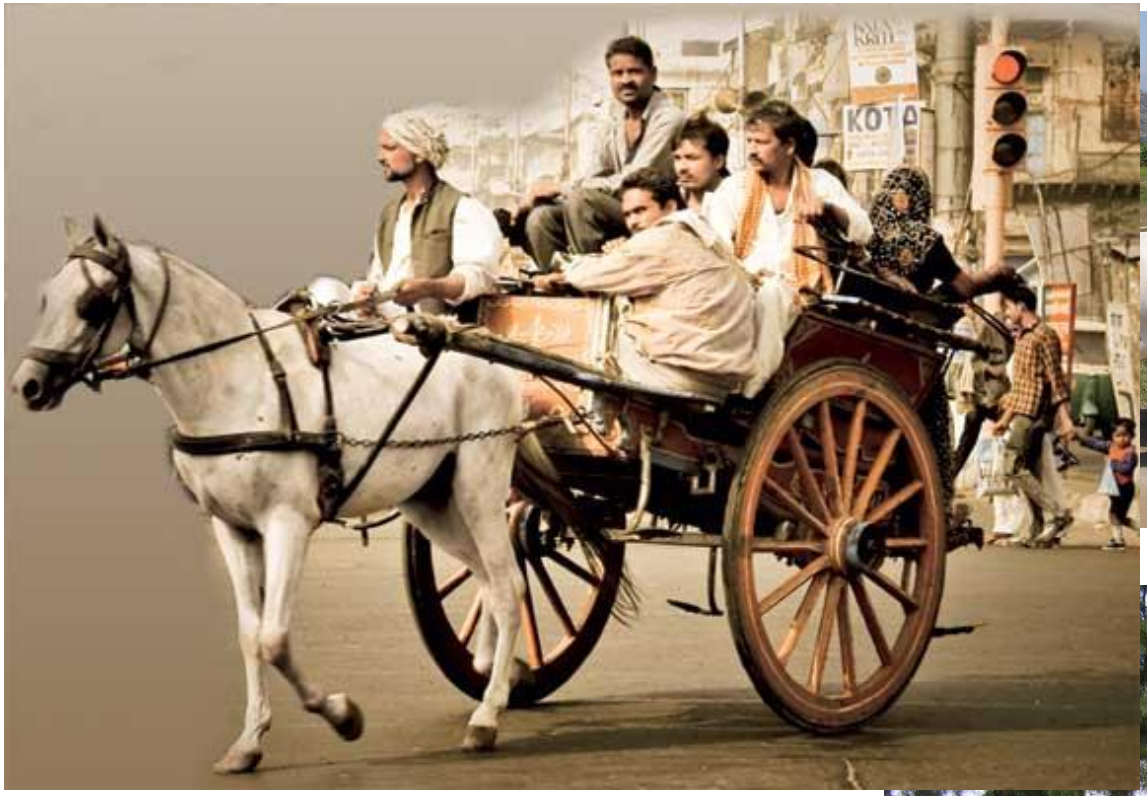
An Unending Search for Best Artificial Horse …..
This Search is due to a Vital Biological Need of Humans…

MOST EXOTIC NEED OF HUMANS :Mobile Power : Animal Driven Vehicles



An Exclusive Thermodynamic Characteristic of Humans

Life on Earth

The humans are extra-somatic heterotrophs.

Motive Power is An important Extra-somatic Need

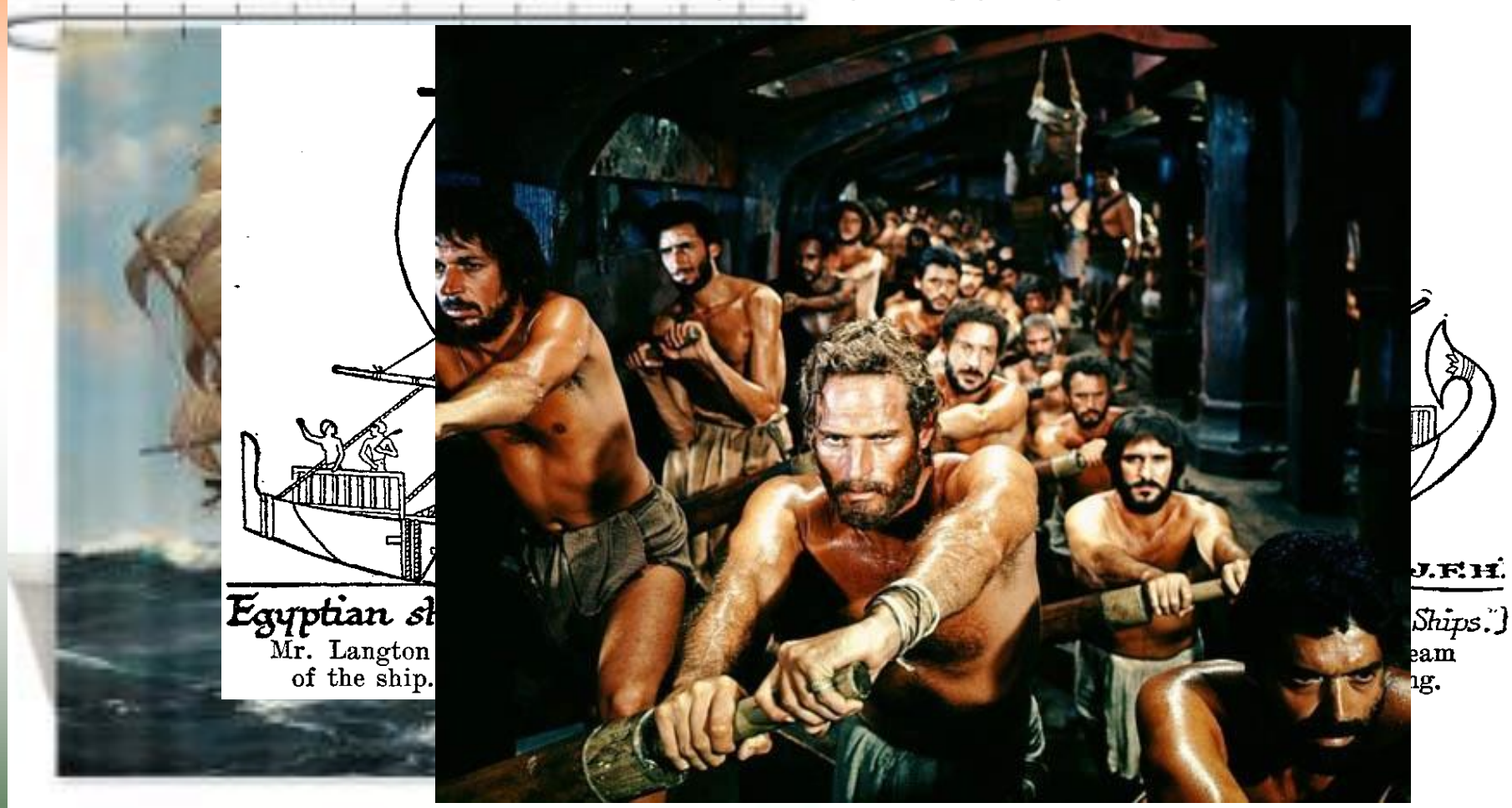
Autotrophs

Heterotrophs

Travel on Water & in Air

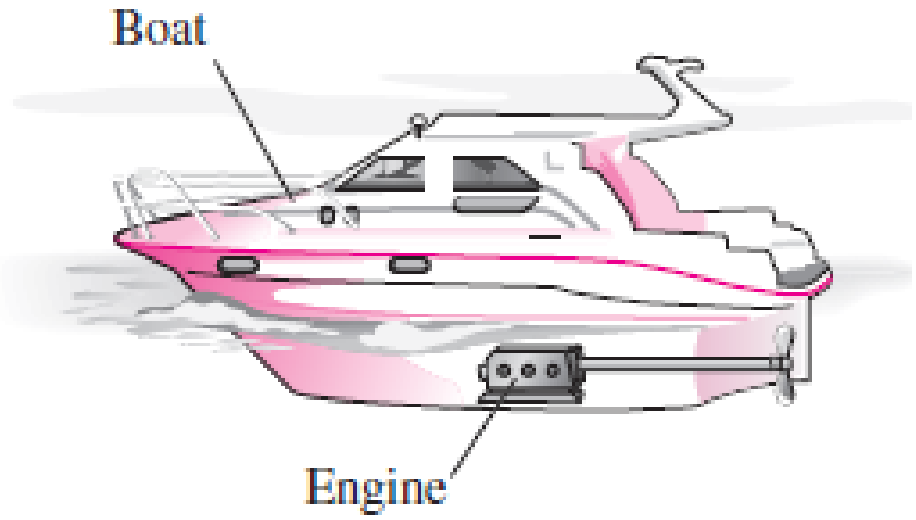
Are the Solutions Well Thought?

Creation of Motive Power: Dangerous & Inhuman Technologies by copying

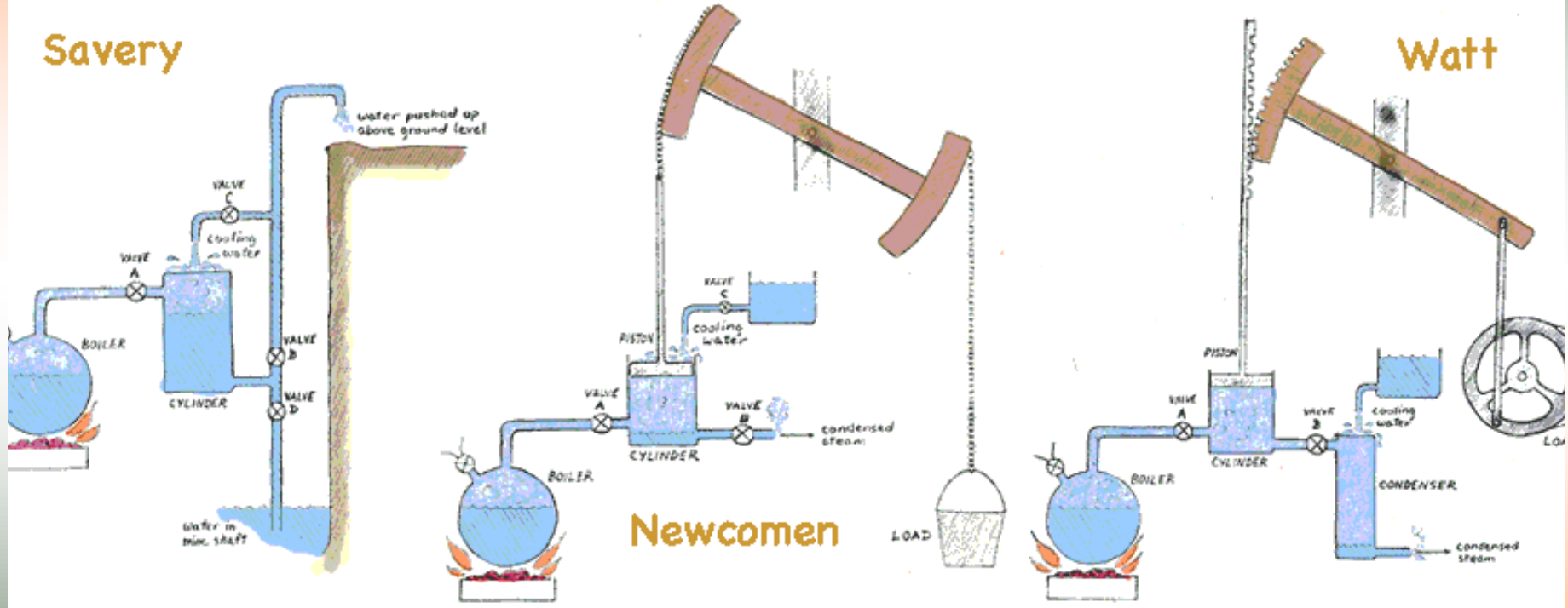


The Greatest Philanthropist

- As an English army officer, Thomas Savery was once ejected from the Lord of the Admiralty's office as a lunatic because he proposed a ship that could be propelled by side-mounted wheels rather than by wind or oars.

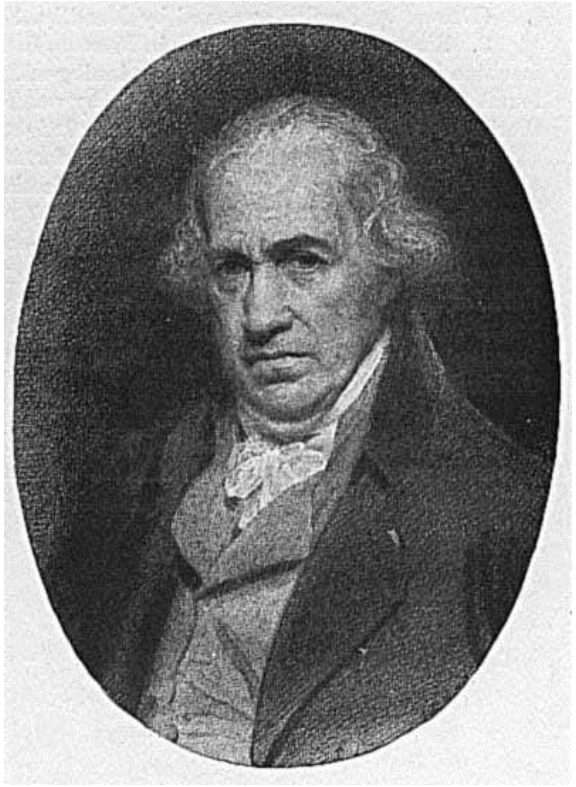


The Family of Steam Engines : Artificial Animals

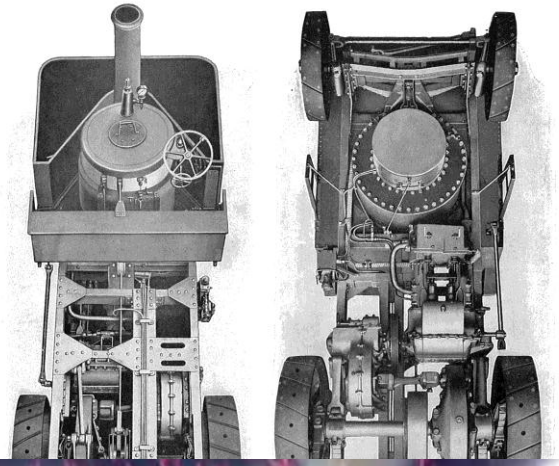


James Watt's Engine :The Artificial Horse Evolved over 100 Years

James Watt radically improved Newcomen's engine (1769) by condensing the steam outside the cylinder .



Steam Wagon/Tractor : Last decade of 19th Century



Steam Tractors

- The first steam tractors that were designed specifically for agricultural uses were portable engines built on skids or on wheels and transported to the work area using horses.
- Later models used the power of the steam engine itself to power a drive train to move the machine and were first known as "traction drive" engines.
- This was which eventually was shortened to "tractor".
- By 1921, steam tractors had demonstrated clear economic advantages over horse power for heavy hauling and short journeys.

The Otto’s Artificial Horse

•Nicolaus Ottowas's first occupation was as a traveling salesman selling tea, coffee, and sugar.
•He soon developed an interest in the new technologies of the day and began experimenting with building four-stroke engines.

•After meeting Eugen Langen, a technician and owner of a sugar factory, Otto quit his job, and in 1864, the duo started the world's first engine manufacturing company N.A. Otto & Cie (now DEUTZ AG, Köln).
•In 1867, the pair were awarded a Gold Medal at the Paris World Exhibition for their atmospheric gas engine built a year earlier.

Why road steam disappeared

- Petrol lorries were starting to show better efficiency and could be purchased cheaply as war surplus.
- On a busy route a 3-ton petrol lorry could save about £100 per month compared to its steam equivalent, in spite of restrictive speed limits, and relatively high fuel prices and maintenance costs.
- Road steam disappeared through becoming uneconomical to operate.

Ferguson TE20 Petrol Tractor

•The **Ferguson TE20** is an agricultural tractor designed by Harry Ferguson.
•It was manufactured from 1946 until 1956.

• Engine:
•Petrol engine, 80 mm bore × 92 mm stroke, capacity 1,850 cc, compression ratio 5.77:1
•Petrol-paraffin engine, 85 mm bore × 92 mm stroke, capacity 2,088 cc, compression ratio 4.5:1

Clue to Achieve Higher Efficiency